

VACUUM

COMPONENTS & CONSUMABLES

neyco

PERIODIC TABLE OF ELEMENTS

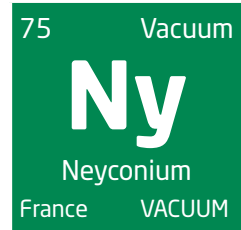
Group I A		II A		III A		IV A		V A		VI A		VII A		VIII A			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
H Hydrogen 1.0	He Helium 4.0	Li Lithium 6.9	Be Beryllium 9.0	B Boron 10.8	C Carbon 12.0	N Nitrogen 14.0	O Oxygen 16.0	F Fluorine 19.0	Ne Neon 20.2	Na Sodium 23.0	Mg Magnesium 24.3	Al Aluminum 27.0	Si Silicon 28.1	P Phosphorus 31.0	S Sulfur 32.1	Cl Chlorine 35.5	Ar Argon 39.9
K Potassium 39.1	Ca Calcium 40.1	Sc Scandium 44.9	Ti Titanium 47.9	V Vanadium 50.9	Cr Chromium 52.0	Mn Manganese 54.9	Fe Iron 55.8	Co Cobalt 58.9	Ni Nickel 58.7	Cu Copper 63.5	Zn Zinc 65.4	Ga Gallium 69.7	Ge Germanium 72.6	As Arsenic 74.9	Se Selenium 79.0	Br Bromine 79.9	Kr Krypton 83.8
Rb Rubidium 85.5	Sr Strontium 87.6	Y Yttrium 88.9	Zr Zirconium 91.2	Nb Niobium 92.9	Mo Molybdenum 95.9	Tc Technetium (98)	Ru Ruthenium 101.1	Rh Rhodium 102.9	Pd Palladium 106.4	Ag Silver 107.9	Cd Cadmium 112.4	In Indium 114.8	Sn Tin 118.7	Sb Antimony 121.8	Te Tellurium 127.6	I Iodine 126.9	Xe Xenon 131.3
Cs Cesium 132.9	Ba Barium 137.3	La Lanthanum 138.9	Hf Hafnium 178.5	Ta Tantalum 180.9	W Tungsten 183.8	Re Rhenium 186.2	Os Osmium 190.2	Ir Iridium 192.2	Pt Platinum 195.1	Au Gold 197.0	Hg Mercury 200.6	Tl Thallium 204.4	Pb Lead 207.2	Bi Bismuth 208.98	Po Polonium 209	At Astatine 210	Rn Radon 222
Fr Francium (223)	Ra Radium (226)	Ac Actinium (227)															

Atomic number → 12 24, 30 → Atomic mass

Name → Magnesium Symbol → **Mg**

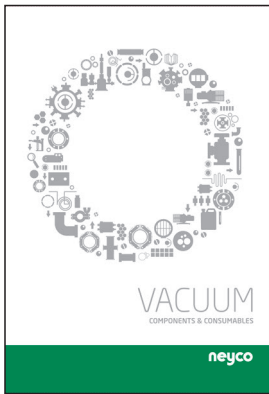
58	59	60	61	62	63	64	65	66	67	68	69	70	71
Ce Cerium 140.1	Pr Praseodymium 140.9	Nd Neodymium 144.2	Pm Promethium (145)	Sm Samarium 150.4	Eu Europium 152.0	Gd Gadolinium 157.2	Tb Terbium 158.9	Dy Dysprosium 162.5	Ho Holmium 164.9	Er Erbium 167.3	Tm Thulium 168.9	Yb Ytterbium 173.0	Lu Lutetium 175.0
90	91	92	93	94	95	96	97	98	99	100	101	102	103
Th Thorium 232.0	Pa Protactinium 231.0	U Uranium 238.0	Np Neptunium (237)	Pu Plutonium (244)	Am Americium (243)	Cm Curium (247)	Bk Berkelium (247)	Cf Californium (251)	Es Einsteinium (252)	Fm Fermium (257)	Md Mendelevium (258)	No Nobelium (259)	Lr Lawrencium (262)

- Alkali metals
- Alkaline earth metals
- Transition metals
- Lanthanides
- Actinides
- Post-transition metals
- Metalloids
- Non metals
- Halogens
- Noble gases

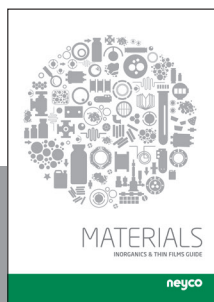


PRIMARY VACUUM
 SECONDARY VACUUM
 HIGH VACUUM
 UHV
 ULTIMATE VACUUM

VACUUM



Cleaner technologies, thinner layers,
 high quality surface treatments are related to high vacuum;
Thus this catalog is dedicated to your improvements...

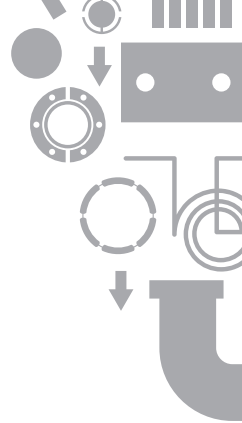


MATERIALS Volume



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First edition



VACUUM

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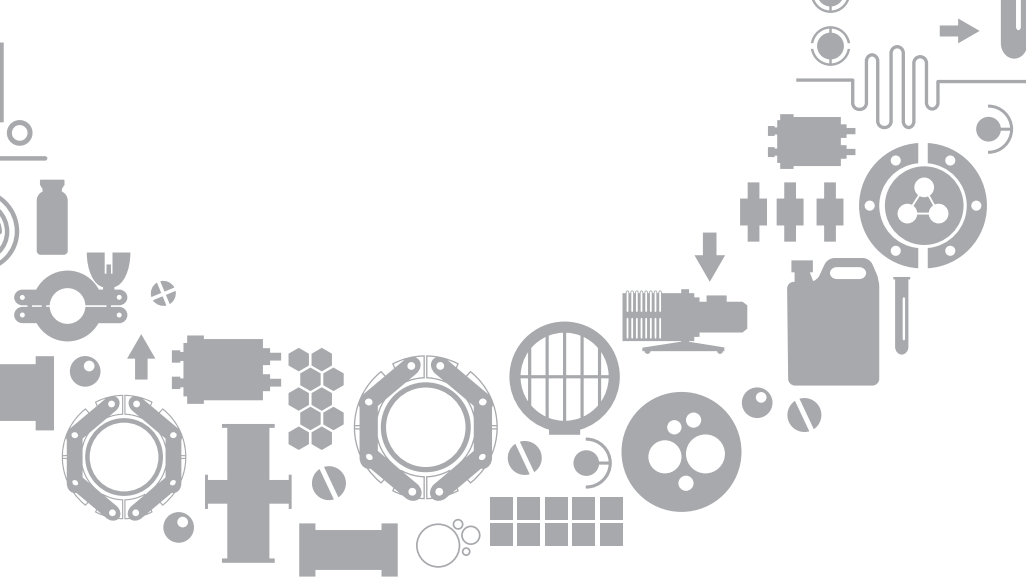
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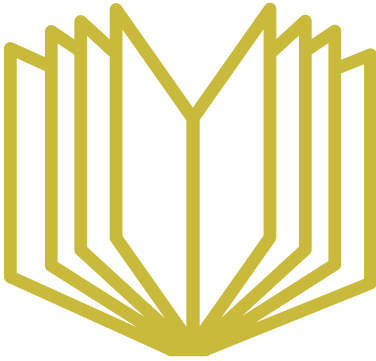
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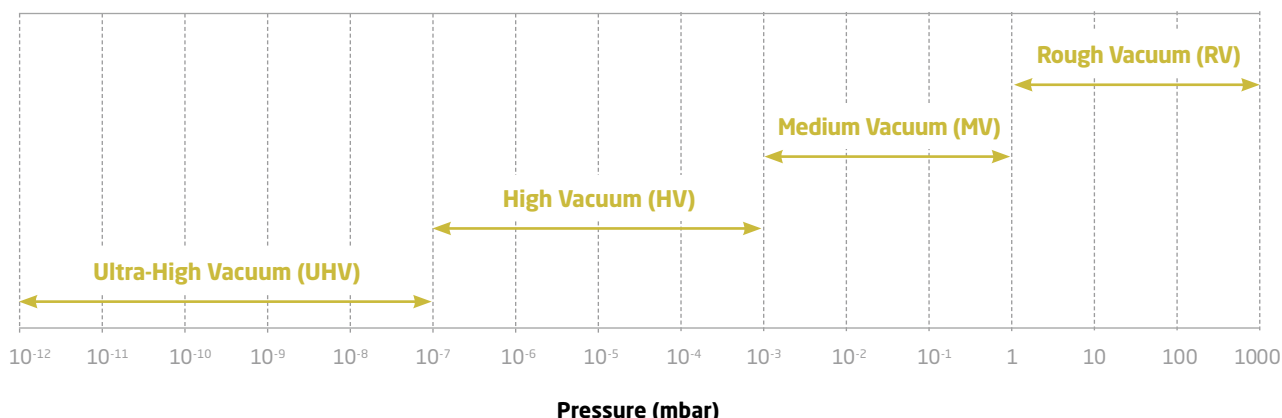
VACUUM VACUUM GUIDE

- Vacuum Ranges and Data A 02
- Some Vacuum Materials..... A 04
- Vacuum Technology Standards..... A 08

Vacuum Ranges and Data

It is common in vacuum technology to subdivide its wide overall pressure range - which spans more than 16 powers of ten - into smaller individual regimes.

These ranges do not have universally agreed definitions, but a typical distribution is as the graph below:



	UNIT	UHV ULTRA-HIGH VACUUM	HV HIGH VACUUM	MV MEDIUM VACUUM	RV ROUGH VACUUM
Pressure	mbar	< 10 ⁻⁷	10 ⁻³ - 10 ⁻⁷	1 - 10 ⁻³	1000 - 1
Particle number density	cm ⁻³	< 10 ⁹	10 ¹³ - 10 ⁹	10 ¹⁶ - 10 ¹³	10 ¹⁹ - 10 ¹⁶
Mean free path	cm	> 10 ⁵	10 - 10 ⁵	10 ⁻² - 10	10 ⁻⁵ - 10 ⁻²
Molecular collision rate	cm ⁻² .s ⁻¹	< 10 ⁹	10 ¹⁷ - 10 ⁹	10 ²³ - 10 ¹⁷	10 ²⁹ - 10 ²³
Monolayer time	s	> 100	10 ⁻² - 100	10 ⁻⁵ - 10 ⁻²	< 10 ⁻⁵
Type of gas flow	-	Molecular flow*	Molecular flow*	Knudsen flow**	Viscous flow***

* Molecular flow: gas flow determined by gas-wall collisions

** Knudsen flow: transition flow

*** Viscous flow: gas flow determined by molecule-molecule collisions

CONVERSION TABLE OF PRESSURES

	Pa (N.m ⁻²)	bar	mbar	μbar (dyn.cm ⁻²)	Torr (mm Hg)	atm	psi (lbf.inch ⁻²)
1 Pa (N.m ⁻²)	1	1.10 ⁻⁵	1.10 ⁻²	10	7.5.10 ⁻³	9.87.10 ⁻⁶	1.45.10 ⁻⁴
1 bar	1.10 ⁵	1	1000	1.10 ⁶	750	0.987	14.5
1 mbar	100	1.10 ⁻³	1	1000	0.75	9.87.10 ⁻⁴	1.45.10 ⁻²
1 μbar (dyn.cm ⁻²)	0.1	1.10 ⁻⁶	1.10 ⁻³	1	7.5.10 ⁻⁴	9.87.10 ⁻⁷	1.45.10 ⁻⁵
1 Torr (mm Hg)	133.3	1.333.10 ⁻³	1.333	1333	1	1.32.10 ⁻³	1.93.10 ⁻²
1 atm	1.01.10 ⁵	1.013	1013	1.01.10 ⁶	760	1	14.7
1 psi (lbf.inch ⁻²)	6.89.10 ³	6.89.10 ⁻²	68.9	6.89.10 ⁴	51.71	6.8.10 ⁻²	1

SOME EXAMPLES ABOUT VACUUM RANGES

	PRESSURE (Pa)	PRESSURE Torr (mbar)	MEAN FREE PATH	MOLECULES /cm ³
Standard atmosphere, for comparison	101.325 kPa	760	66 nm	2.5.10 ¹⁹
Vacuum cleaner	approximately 8.10 ⁴	600	70 nm	10 ¹⁹
Liquid ring vacuum pump	approximately 3.2.10 ³	24	1.75 μm	10 ¹⁸
Mars atmosphere	1.155 kPa to 0.03 kPa (mean 0.6 kPa)	8.66 to 0.23		
Freeze drying	100 to 10	1 to 0.1	100 μm to 1 mm	10 ¹⁶ to 10 ¹⁵
Rotary vane pump	100 to 0.1	1 to 10 ⁻³	100 μm to 10 cm	10 ¹⁶ to 10 ¹³
Incandescent light bulb	10 to 1	0.1 to 0.01	1 mm to 1 cm	10 ¹⁵ to 10 ¹⁴
Thermos bottle	1 to 0.01	10 ⁻² to 10 ⁻⁴	1 cm to 1 m	10 ¹⁴ to 10 ¹²
Earth thermosphere	1 Pa to 1.10 ⁻⁷	10 ⁻² to 10 ⁻⁹	1 cm to 100 km	10 ¹⁴ to 10 ⁷
Vacuum tube	1.10 ⁻⁵ to 1.10 ⁻⁸	10 ⁻⁷ to 10 ⁻¹⁰	1 to 1 000 km	10 ⁹ to 10 ⁶
Cryopumped MBE chamber	1.10 ⁻⁷ to 1.10 ⁻⁹	10 ⁻⁹ to 10 ⁻¹¹	100 to 10 000 km	10 ⁷ to 10 ⁵
Pressure on the Moon	approximately 1.10 ⁻⁹	10 ⁻¹¹	10 000 km	4.10 ⁵

Some Vacuum Materials

OUTGASSING RATES (AT ROOM TEMPERATURE)

MATERIAL	PREVIOUS TREATMENT	PUMPING TIME (hours)	OUTGASSING RATE AFTER PUMPING (mbar.l.s ⁻¹ .cm ²)
Steel	Non polished, slightly rusted	8	2.10 ⁻⁸
	Polished	8	2.10 ⁻⁹
Stainless Steel	Machined	5	2.10 ⁻⁹
	Alcohol cleaned	5	9.10 ⁻¹⁰
	Alcohol cleaned	24	2.10 ⁻¹⁰
	400°C baking	16	3.10 ⁻¹⁴
	Chemically cleaned	12	< 10 ⁻¹²
	300°C baking	24	10 ⁻¹²
Aluminum	Polished	5	7.10 ⁻¹⁰
	Alcohol cleaned	24	1.5.10 ⁻¹⁰
	400°C baking	16	2.10 ⁻¹⁴
Elastomer: - Viton - Viton - Viton - Teflon - Silicone - Neoprene	-	24	2.10 ⁻⁸
	4 h, 150°C baking	15	10 ⁻¹⁰
	16 h, 200°C baking	15	10 ⁻¹⁰
	-	48	3.5.10 ⁻¹⁰
	-	24	4.4.10 ⁻⁹
	-	24	5.4.10 ⁻⁸

SOME STANDARDS AND COMPOSITIONS FOR AUSTENITIC STAINLESS STEELS

AISI*	NF EN 10088-1		FRANCE	TYPICAL COMPOSITION %			
				C	Cr	Mo	Ni
301	1.4310	X10CrNi18-8	Z12CN18-09	0.05 - 0.15	16 - 19	< 0.8	6 - 9.5
304	1.4301	X5CrNi18-10	Z6CN18-09	< 0.07	17.0 - 19.5	-	8.0 - 10.5
304L	1.4306	X2CrNi19-11	Z3CN18-10	< 0.03	18.0 - 20.0	-	10 - 12
304L	1.4307	X2CrNi18-9	Z3CN18-09	< 0.03	17.5 - 19.5	-	8 - 10
316	1.4401	X5CrNiMo17-12-2	Z6CND17-11	< 0.07	16.5 - 18.5	2 - 2.5	10 - 12
316L	1.4404	X2CrNiMo17-12-2	Z2CND17-12	< 0.03	16.5 - 18.5	2 - 2.5	11 - 13
316L	1.4435	X2CrNiMo18-14-3	Z3CND18-14-03	< 0.03	17 - 19	2 - 3	12.5 - 14
316LN	1.4429	X2CrNiMoN17-13-3	Z2CND17-13	< 0.03	16.5 - 18.5	2 - 3	12 - 14
316Ti	1.4571	X6CrNiMoTi17-12-2	Z6CNDT17-12	< 0.06	16.5 - 18.5	2.5 - 3	11 - 13
321	1.4541	X6CrNiTi18-10	Z6CNT18-10	< 0.06	17 - 19	-	9 - 12

*AISI: American Iron Steel Institute

PROPERTIES OF COPPER

**OFHC: Oxygen Free High Conductivity

PURITY	99.95% Cu	99.99% Cu
Alloy Name	OFHC**	Certified OFHC*
French Name	Cu-c1	Cu-c2
ISO CEN	Cu-OF	Cu-OFE
USA	C10200	C10100
Density	8.94 g.cm ⁻³	8.94 g/cm ³
Thermal conductivity (at 20°C)	389 W.m ⁻¹ .K ⁻¹	392 W.m ⁻¹ .K ⁻¹
Electrical conductivity (at 20°C, % IACS)	100	101
Resistivity (at 20°C)	1.7.10 ⁻⁸ Ω.m	1.7.10 ⁻⁸ Ω.m

SOME ELASTOMERS AND PLASTICS PROPERTIES

MATERIAL NAME	CHEMICAL NAME	COLOUR	HARDNESS SHORE A	TEMPERATURE RANGE	TENSILE STRENGTH AT BREAK
Viton FPM FKM	Fluorocarbone Vynilidene-fluoridehexafluoropropene	Black Green	65-95	-20°C to +200°C	20 MPa
Nitrile Buna N Perbunan NBR	Butadiene acrylonitrile	Black	30-90	-20°C to +120°C	27 Mpa
EPDM	Ethylene propylene diene monomer	Black	40-90	-40°C to +140°C	25 MPa
Silicone MVQ	Polysiloxane	Brick red Yellow	40-80	-90°C to 200°C	10 MPa
Kalrez Chemraz FFKM	Perfluoroelastomers	Black	65-95	-10°C to 300°C	15 Mpa
Neoprene CR	Chloroprene rubber	Black	30-90	-40°C to 105°C	25 Mpa
Teflon PTFE	Polytetrafluoroethylene	White	50-65 (shore D)	-150 to +250 °C	10-40 Mpa
PEEK	Polyether ether ketone	Black	85-90 (shore D)	-50°C to 250°C	90-110 Mpa

SOME GLASS PROPERTIES

Borosilicate glasses used commonly in vacuum are Duran and Pyrex. They are trade names for Borosilicate glass, class 3.3 according to standard ISO 3585.

Kodial is common glass used as sealing glass. It is an Alkali Borosilicate glass type and thus used in vacuum technology for viewport assemblies.

Chemical compositions

	SiO ₂	B ₂ O ₃	Na ₂ O + K ₂ O	Al ₂ O ₃
Duran/Pyrex	~ 81 %	~ 13 %	~ 4 %	~ 2.3 %
Kodial	~ 68 %	~ 18 %	~ 10 %	~ 3 %

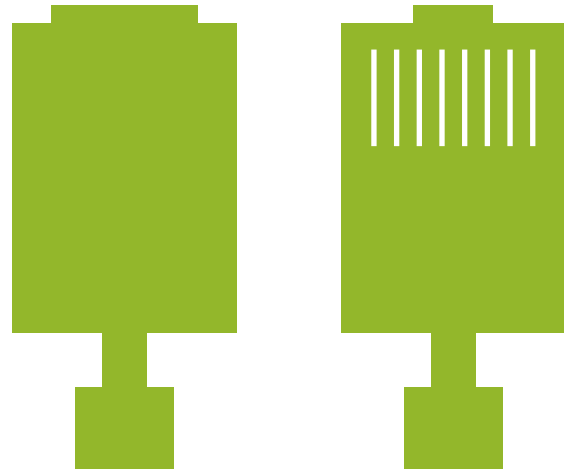
Properties

	DURAN/PYREX	KODIAL	QUARTZ
Average linear expansion coefficient (20 - 300°C, ISO 7991)	$3.3 \cdot 10^{-6} \text{ } ^\circ\text{C}^{-1}$	$5.15 \cdot 10^{-6} \text{ } ^\circ\text{C}^{-1}$	$5.5 \cdot 10^{-7} \text{ } ^\circ\text{C}^{-1}$
Refractive index ($\lambda = 587.6 \text{ nm}$)	1.473	1.487	1.4585
Density (at 20°C)	2.23 g.cm ⁻³	2.29 g.cm ⁻³	2.2 g.cm ⁻³
Thermal conductivity (20 - 100 °C)	1.16 W.m ⁻¹ .K ⁻¹	1.19 W.m ⁻¹ .K ⁻¹	1.4 W.m ⁻¹ .K ⁻¹
VISCOSITY TEMPERATURES			
Strain point (lower cooling temperature, 10 ^{14.7} dPa.s)	510°C	472°C	1070°C
Annealing point (upper cooling point, 10 ¹³ dPa.s)	560°C	512°C	1140°C
Softening temperature (10 ^{7.5} dPa.s)	820°C	718°C	1665°C
Working point (processing temperature, 10 ⁴ dPa.s)	1252°C	1058	1000°C
MECHANICAL PROPERTIES			
Elasticity modulus (Young's modulus)	64.10 ³ MPa	64.10 ³ MPa	70.10 ³ MPa
Poisson's ratio	0.20	2.21	0.17
ELECTRICAL PROPERTIES			
Log ₁₀ of volume resistivity	13-15 Ω.cm (at 20°C)	10.3 Ω.cm (at 250°C)	16 Ω.cm (at 20°C)
Dielectric constant (20°C, 1 MHz)	4.6	5.7	3.75
Dielectric loss factor tan δ	37.10 ⁻⁴	27.10 ⁻⁴	< 4.10 ⁻⁴

Vacuum Technology Standards

ISO STANDARDS: ICS 23.160 VACUUM TECHNOLOGY	
ISO 1609	Vacuum technology - Flange dimensions
ISO 2861	Vacuum technology - Dimensions of clamped-type quick-release couplings Vacuum technology - Quick-release couplings - Dimensions - Clamped type
NF ISO 3529-1	Vacuum technology - Vocabulary - Part 1: General terms
NF ISO 3529-2	Vacuum technology - Vocabulary - Part 2: Vacuum pumps and related terms
NF ISO 3529-3	Vacuum technology - Vocabulary - Part 3: Vacuum gauges
ISO 3530	Vacuum technology - Mass-spectrometer-type leak-detector calibration
ISO 3567	Vacuum gauges - Calibration by direct comparison with a reference gauge
ISO/TS 3669-2	Vacuum technology - Bakable flanges - Part 2: Dimensions of knife-edge flanges
ISO 9803-1	Vacuum technology - Mounting dimensions of pipeline fittings - Part 1: Non knife-edge flange type
ISO 9803-2	Vacuum technology - Mounting dimensions of pipeline fittings - Part 2: Knife-edge flange type
ISO 4080	Rubber and plastics hoses and hose assemblies - Determination of permeability to gas

FRENCH AND EUROPEAN STANDARDS	
NF EN 837-1	Pressure gauges. Bourdon tube pressure gauges. Dimensions, metrology, requirements and testing
NF EN 837-2	Pressure gauges. Selection and installation recommendations for pressure gauges
NF EN 837-3	Pressure gauges. Diaphragm and capsule pressure gauges. Dimensions, metrology, requirements and testing
NF EN 1330	Non-destructive testing - Terminology - Part 8: Terms used in leak tightness testing
NF EN 1779	Non-destructive testing - Leak testing - Criteria for method and technique selection
NF EN 1518	Non-destructive testing - Leak testing - Characterization of mass spectrometer leak detectors
NF EN 1593	Non-destructive testing - Bubble emission techniques



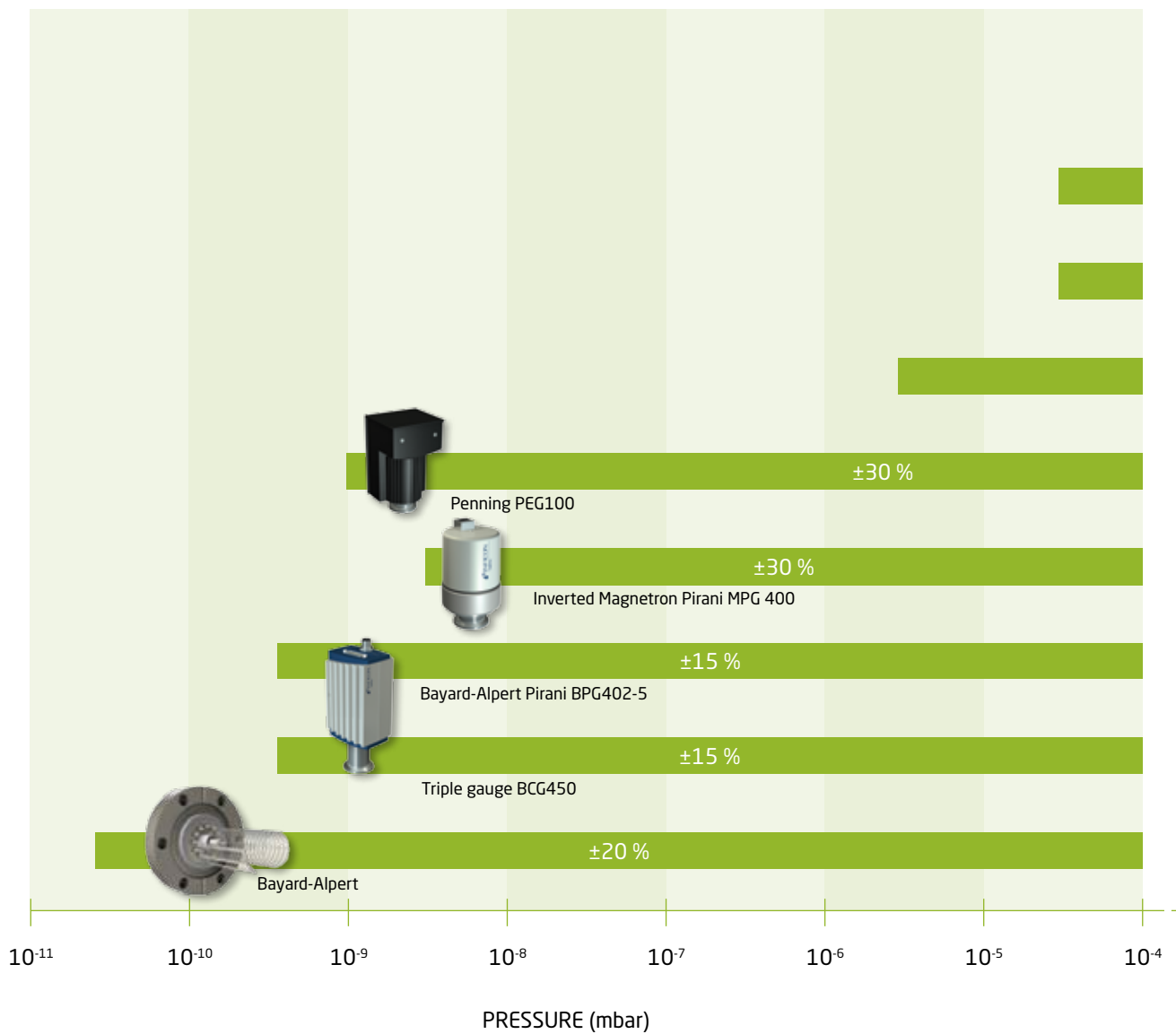
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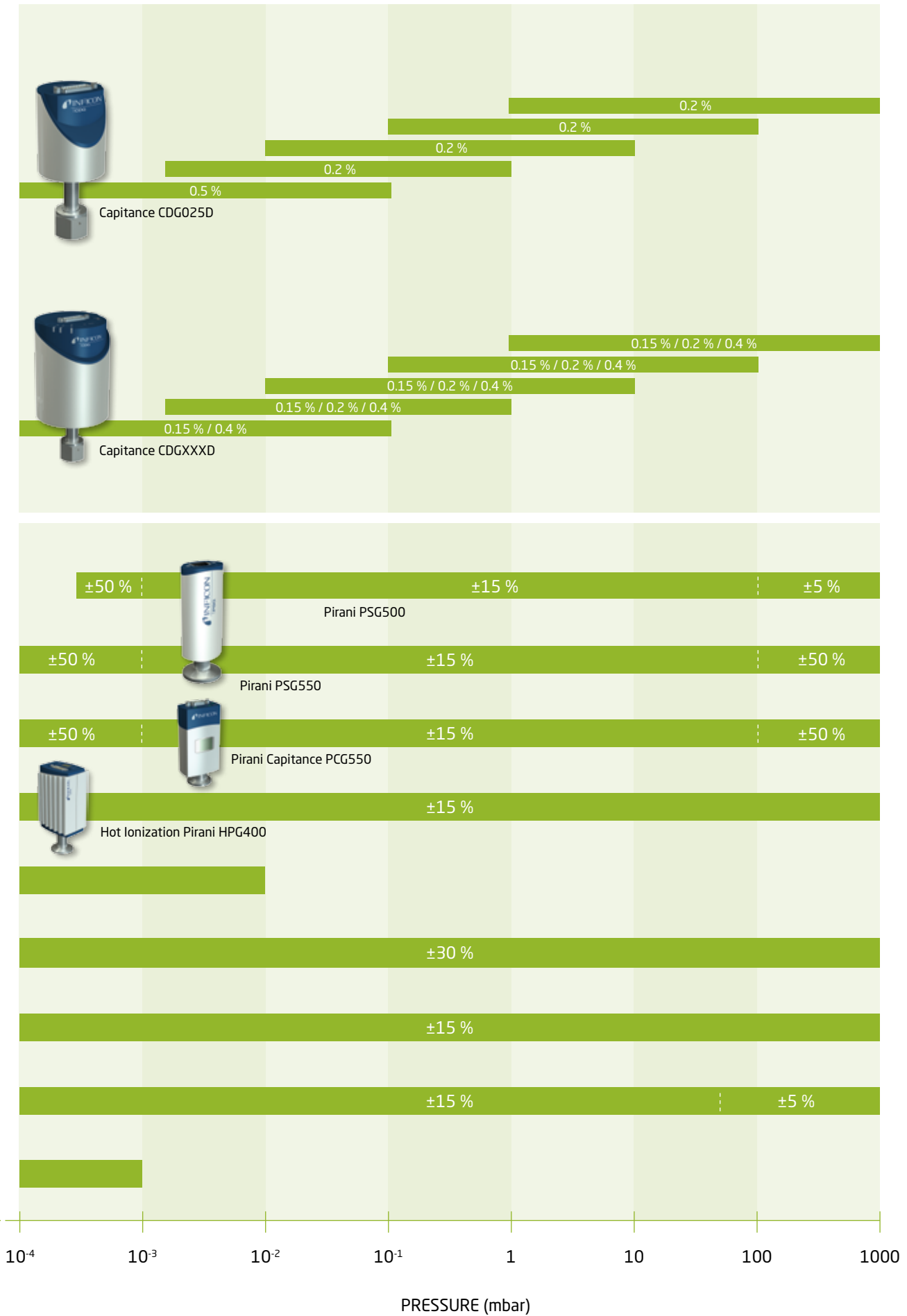
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SELECTING A VACUUM GAUGE

Accuracy (% of reading)





Capacitance Diaphragm Gauges

TEMPERATURE COMPENSATED CAPACITANCE GAUGE CDG025D SERIES

The INFICON SKY CDG025D Capacitance Diaphragm Gauge line of highly accurate temperature compensated manometers is designed for stable performance in harsh manufacturing tool environments. The corrosion resistant

ultra pure ceramic sensor provides excellent zero stability with a long life expectancy of several million pressure cycles, including atmospheric bursts. A unique sensor shielding protects the gauge from process contamination.

ADVANTAGES

- Full scale ranges from 100 mTorr to 1000 Torr.
- Fast stability after power on.
- Fast recovery from atmospheric pressure.
- Corrosion resistant ceramic sensor.
- Excellent long term signal stability.
- Temperature compensated.
- Sensor protected from contamination.
- One pushbutton zero function.
- Wide range power supply.
- Options: 2 setpoints, RS232 interface, DeviceNet™, Profibus DP.
- CDG025D-X3: clean room compliant.

Available in: DN 16 KF, DN 16 CF-R, 8 VCR, 1/2" tube.



Capacitance Diaphragm Gauge CDG025D

SPECIFICATIONS

		Units	CDG 025D
Measurement range F.S. (Full Scale)		Torr	1000 to 0.1
Accuracy ⁽¹⁾	1000/100/10/1 Torr	% of reading	0.2 %
	0.1 Torr	% of reading	0.5 %
Resolution		% F.S.	0.003 %
Temperature effect	on zero	% F.S./°C	0.005 (1000 to 10 Torr)/0.015 (1 Torr)/0.02 (0.1 Torr)
	on span	% of reading/°C	0.01 (1000 to 1 Torr)/0.03 (0.1 Torr)
Pressure max.	1000 Torr	hPa	4000
	100/10/1 Torr	hPa	2600
	0.1 Torr	hPa	1300
Lowest suggested control pressure		% F.S.	0.5
Supply voltage		V DC	+14 ... +30
Admissible temperature	operation	°C	+5 ... +50
	bakeout at flange ⁽²⁾	°C	≤ 110
Materials exposed to vacuum			Al ₂ O ₃ , Stainless Steel 316L

(1) Non-linearity, hysteresis, repeatability at 25°C ambient operating temperature without temperature effects after 2 hours operation.
 (2) Non operation.

Other flange types and full scale ranges (F.S.) on request.

TEMPERATURE CONTROLLED CAPACITANCE DIAPHRAGM GAUGES CDG045D / 100D / 160D / 200D

INFICON SKY CDG series manometers are temperature controlled at 45, 100, 160 or 200°C for superior signal stability and repeatability. They are available for full scale ranges from 100 mTorr to 1000 Torr (1 Torr to 1000

Torr for 160D and 200D), with all common flange types and fieldbus interfaces and provide a linear 0 to 10 V, gas type independent, pressure signal. They use an ultra pure alumina ceramic diaphragm which is corrosion proof. The advantages of the ceramic sensor are better signal stability, faster recovery from atmosphere, short warm up time and an extraordinary lifetime.



Capacitance Diaphragm Gauge CDG045D/100D/160D/200D

ADVANTAGES

- Standard with two set points, RS232.
- Easy one push button or remote signal zero command, zero offset adjustable.
- Diagnostic port for quick service and maintenance.
- No long term recalibration due to excellent signal stability and repeatability, even in harsh plasma applications.
- Options: DeviceNet™, Profibus DP.

Available in: DN 16 KF, DN 16 CF-R, 8 VCR, 1/2" tube.

SPECIFICATIONS

		Units	CDG 45D / 100D	CDG 160D / 200D
Measurement range F.S. (Full Scale)		Torr	1000 to 0.1	1000 to 1
Accuracy ⁽¹⁾		% of reading	0.15% (45D) 0.2% (100D) / 0.4% (100D, 0.1 Torr)	0.4%
Resolution		% F.S.	0.003%	
Temperature effect	on zero	% F.S./°C	0.0025 / 0.005 (0.1 Torr)	0.005
	on span	% of reading/°C	0.01 (45D) / 0.02 (100D)	0.02
Pressure max.	1000 Torr	hPa	4000	4000
	100 / 10 / 1 Torr	hPa	2600	2600
	0.1 Torr	hPa	1300	-
Lowest suggested control pressure		% F.S.	0.5	
Supply voltage		V DC	+14 ... +30 or ±15	+21 ... +30 or ±15
Admissible temperature	operation	°C	+10 ... +40 (+50 for 100D)	+10 ... +50
	bakeout at flange	°C	≤ 110	≤ 200
Materials exposed to vacuum			Al ₂ O ₃ , Stainless Steel 316L	

(1) Non-linearity, hysteresis, repeatability at 25°C ambient operating temperature without temperature effects after 2 hours operation.

Other flange types and full scale ranges (F.S.) on request.

Accessories: communication adapter (2 m) for PC RS232 serial port.

Pirani Gauges

INFICON PIRANI GAUGES PSG500 AND PSG550 SERIES

ADVANTAGES

PSG500 Serie

- Mounts in any orientation.
- Aluminum housing.
- Easy push button ATM and HV adjustment.
- Available with Tungsten (PSG500/510-S) or Nickel filament option for corrosive applications (PSG502-S/512-S).
- Ceramic feedthrough for extremely corrosive applications (PSG510-S & PSG512-S).
- Optional setpoints (2).

PSG550 Serie

- Mounts in any orientation.
- Available with Tungsten (PSG550) or Nickel (PSG552) filament.
- Available with a fully Ceramic coated (PSG554) sensor unit for highly corrosive applications.
- Optional display, setpoints and digital interfaces.

- Easy to exchange plug & play sensor element with on-board calibration data.
- Eligible output signal and various plug versions for easy integration.

Available in: DN 16 KF, DN 16 CF-R, 1/8" NPT, 8 VCR, 4 VCR, 1/2" tube, 7/16-20 UNF, DN 16 KF long tube, DN 16 CF-R long tube.



Pirani Gauge PSG500

SPECIFICATIONS

		Units	PSG500 Series	PSG550 Series
Measurement range		mbar	5.10 ⁻⁴ to 1000	5.10 ⁻⁵ to 1000
Accuracy (N ₂)	5.10 ⁻⁴ ... 1.10 ⁻³ mbar	% of reading	±50%	±50%
	1.10 ⁻³ ... 100 mbar	% of reading	±15%	±15%
	100 ... 1000 mbar	% of reading	±50%	±50%
Resolution at 1000 mbar		% of reading	±1%	±0.15%
Repeatability (N ₂)	1.10 ⁻³ ... 100 mbar	% of reading	±2%	±2%
Admissible pressure		bar	10, limited to inert gases	≤ 5
Supply voltage	at gauge	V DC	+14 ... +30	+15 ... +30
Power consumption		W	≤ 1	-
	without fieldbus	W	-	≤ 2.5
	DeviceNet™	W	-	≤ 3
	Profibus	W	-	≤ 3
Admissible temperature	operation	°C	+5 ... +60	+10 ... +50
	bakeout at flange ⁽¹⁾	°C	80/250 ⁽¹⁾⁽²⁾	80/250 ⁽²⁾
Materials exposed to vacuum	Tungsten filament	-	W, Ni, NiFe, glass, Stainless Steel	W, Ni, NiFe, glass, SnAg, Stainless Steel
	Nickel filament	-	Ni, NiFe, glass, Stainless Steel	Ni, NiFe, glass, SnAg, Stainless Steel
	Ceramic feedthrough	-	W (filament), Ni, FeNiCo, Al ₂ O ₃ , Stainless Steel	-
	Ceramic coated	-	-	Ceramic, Stainless Steel

(1) In horizontal mounting operation.

(2) Long tube.

Spare parts: replacement sensor for Tungsten, Nickel or Ceramic coated filament.

PIRANI CAPACITANCE DIAPHRAGM GAUGE PCG550 SERIES



Pirani Capacitance Diaphragm Gauge PCG550 Series

The INFICON Pirani Capacitance Diaphragm Gauge (PCG55x) combines the ceramic capacitance diaphragm sensor technology with the advantages of a Pirani unit in a single product.

In the measurement range between 10 mbar and atmosphere the capacitance diaphragm technology provides gas-type independent, highly accurate values for reliable pressure measurement.

ADVANTAGES

- Gas-type independent above 10 mbar - allows safe venting with any gas mixture.
- High accuracy and reproducibility at atmosphere - for reliable atmospheric pressure detection.
- Fast atmospheric detection - eliminates waiting time and shortens process cycle.
- Versatile of mounting orientation.
- Available with Tungsten (PCG550) or Nickel (PCG552) filament or with a fully ceramic coated (PCG554) sensor unit for highly corrosive applications.
- Easy to exchange plug & play sensor element with on-board calibration data.
- Eligible output signal for easy integration.
- Optional atmospheric switch, display and digital interfaces.

Available in: DN 16 KF, DN 16 CF, 1/8" NPT, 8 VCR female, 4 VCR female, 4 VCR 90° female, 7/16-20 UNF male, DN 16 KF long tube, DN 16 CF-R long tube.

SPECIFICATIONS

		Units	PCG550 Series
Measurement range		mbar	$5 \cdot 10^{-5}$ to 1500
Accuracy (N ₂)	$5 \cdot 10^{-4}$... $1 \cdot 10^{-3}$ mbar	% of reading	±50%
	$1 \cdot 10^{-3}$... 100 mbar	% of reading	±15%
	100 ... 950 mbar	% of reading	±5%
	950 ... 1050 mbar	% of reading	±2.5%
Repeatability (N ₂)	$1 \cdot 10^{-3}$... 1100 mbar	% of reading	±2%
Admissible pressure		bar	≤ 5
Supply voltage	at gauge	V DC	+15 ... +30
Power consumption	without fieldbus	W	≤ 2.5
	DeviceNet™	W	≤ 3
	Profibus	W	≤ 3
Admissible temperature	operation	°C	+10 ... +50
	bakeout at flange	°C	80 / 250 ⁽¹⁾
Materials exposed to vacuum	Tungsten filament	-	W, Ni, NiFe, glass, SnAg, Stainless Steel
	Nickel filament	-	Ni, NiFe, glass, SnAg, Stainless Steel
	Ceramic coated	-	Ceramic, Stainless Steel

(1) Long tube.

Spare parts: replacement sensor for Tungsten or Nickel filament.

Penning and Full-Range Gauges

PENNING GAUGE PEG100



Penning Gauge PEG100

The INFICON rugged Penning cold cathode sensor has no filament to burn out. Due to Titanium cathode plates and the reduced high voltage after plasma ignition, the gauge can be operated also in sputtering applications.

ADVANTAGES

- Wide measurement range from $1 \cdot 10^{-9}$ to $1 \cdot 10^{-2}$ mbar.
- All-metal cold cathode sensor (Penning) with ceramic feedthrough.
- Decreased high voltage after plasma ignition and Titanium cathode plates reduce risk of contamination, even during sputtering operations with Argon.
- The anode ring and the Titanium cathode can be cleaned or replaced easily.
- Minimal magnetic field intensity adjacent to gauge.
- LED indicator for power on and plasma ignited.
- Fieldbus interface (Profibus DB, DeviceNet) in option.

Available in: DN 25 KF, DN 40 CF-R.

SPECIFICATIONS

		Units	PCG100
Measurement range		mbar	$1 \cdot 10^{-9}$ to $1 \cdot 10^{-2}$
Accuracy	10^{-8} ... 10^{-4} mbar	% of reading	$\pm 30\%$
Admissible pressure		bar	10
Supply voltage		V DC	+14.5 ... +36
Power consumption max.		W	≤ 2
Admissible temperature	operation	$^{\circ}\text{C}$	+10 ... +50
	bakeout without electronics	$^{\circ}\text{C}$	350
	bakeout at flange	$^{\circ}\text{C}$	70
Materials exposed to vacuum		-	Stainless Steel, CrNi, Al_2O_3 , NiFe, Mo, Cu, Ni, Ti

Spare parts: replacement Titanium cathodes plates (set of 5 pieces).

INVERTED MAGNETRON PIRANI GAUGE MPG400 SERIES



Inverted Magnetron Pirani Gauge MPG400 Serie

The INFICON Inverted Magnetron Pirani Gauges, MPG400 and MPG401, measure from $5 \cdot 10^{-9}$ mbar to atmosphere. Combining technologies into one single compact unit one with logarithmic analog output signal significantly reduces the complexity of installation, setup and integration.

ADVANTAGES

- Wide measurement range from $5 \cdot 10^{-9}$ mbar to atmosphere.
- No filament to burn out.
- Excellent ignition properties.
- Mounts in any orientation.
- Easy to clean.
- FPM (MPG400) or metal-sealed (MPG401) feedthrough.
- LED indicator for high voltage on.

Available in: DN 25 KF, DN 40 KF, DN 40 CF-F.

SPECIFICATIONS

		Units	MPG400
Measurement range		mbar	$5 \cdot 10^{-9}$ to 1000
Accuracy	10^{-8} ... 100 mbar	% of reading	$\approx \pm 30\%$
Repeatability	10^{-8} ... 100 mbar	% of reading	$\approx \pm 5\%$
Admissible pressure		bar	≤ 10 , limited to inert gases
Supply voltage		V DC	+15 ... +30
Power consumption max.		W	≤ 2
Admissible temperature	operation	°C	+5 ... +55
	bakeout	°C	150 ⁽¹⁾
Materials exposed to vacuum		-	Stainless Steel, Al_2O_3 , Mo, Ni, Au, W FPM75 (FPM sealed), Ag, Cu, Sn (metal-sealed)

(1) Without electronics and magnetic shielding.

Spare parts:

- Maintenance kit: Support/centering ring, seals, ignition aid.
- Repair kit: Pirani element, anode, anode extension⁽²⁾, Cu seal⁽²⁾, screw fitting⁽²⁾, support/centering ring, seals, ignition aid.
- Ignition aid kit: Ignition aid.
- Mounting tool for ignition aid.

Accessories: magnetic shield.

(2) MPG401 only

HIGH PRESSURE HOT IONIZATION PIRANI GAUGE HPG400

INFICON HPG400 combines High Pressure Hot Ionization and Pirani sensors in a single, compact package to measure pressure from $2 \cdot 10^{-6}$ mbar to atmosphere. The HPG400 provides highly repeatable and reproducible pressure measurement for accurate sputter process pressure control.



High Pressure Hot Ionization Pirani Gauge HPG400

ADVANTAGES

- User selectable hot ion emission activation between $5 \cdot 10^{-2}$ and 1 mbar.
- Pirani interlock protects the hot filament from premature burnout.
- Automatic high vacuum Pirani adjustment reduces operator interventions.
- Options: LCD display, Profibus DP, DeviceNet™.

Available in: DN 25 KF, DN 40 CF-F.

SPECIFICATIONS

		Units	HPG400
Measurement range		mbar	$2 \cdot 10^{-6}$ to 1000
Accuracy	10^{-5} ... 1 mbar	% of reading	$\pm 15^{(1)}$ %
Repeatability	10^{-5} ... 10^{-1} mbar	% of reading	2%
	10^{-1} ... 100 mbar	% of reading	30%
Admissible pressure		bar	5
Supply voltage		V/A DC	20 ... 28/0.8
Admissible temperature	operation	°C	+5 ... +50
	bakeout	°C	80 at flange, 150 electronics removed
Materials exposed to vacuum		-	Y_2O_3 , Ir, Pt, Mo, Cu, W, NiFe, NiCr, Stainless Steel, glass

(1) Accuracy from 10^{-5} mbar to the selected hot ion emission on value.

Spare parts: replacement sensor DN 25 KF, DN 40 CF-F.

Accessories: power supply 24 V DC / RS232C line.

BAYARD-ALPERT PIRANI GAUGE BPG402-S

The INFICON Bayard-Alpert Pirani Combination Gauge, BPG402-S, functions as two gauges in a single compact unit measuring from 5.10^{-10} mbar to atmosphere. Combining technologies reduces the complexity of installation, setup, and integration. Choose the BPG402-S with dual Yttrium Oxide coated Iridium filaments for affordable and repeatable process to base pressure measurements in one economical package.



Bayard-Alpert Pirani Gauge BPG402-S

ADVANTAGES

- Excellent repeatability in the process pressure range from 10^{-8} ... 10^{-2} mbar of 5%.
- Pirani interlock protects the filament from premature burnout.
- Dual long-life Yttrium Oxide coated Iridium filament.
- Options : LCD display, Profibus DP, DeviceNet™.
- Automatic high vacuum Pirani adjustment reduces operator interventions.
- Easy to exchange sensing element with on-board calibration data guarantees high reproducibility.

Available in: DN 25 KF, DN 40 CF-R.

SPECIFICATIONS

		Units	BPG402-S
Measurement range		mbar	5.10^{-10} to 1000
Accuracy	10^{-8} ... 10^{-2} mbar	% of reading	±15 %
Repeatability	10^{-8} ... 10^{-2} mbar	% of reading	5 %
Degas ⁽¹⁾	$p < 7.2.10^{-6}$	mbar	Electron bombardment, max. 3 min
Admissible pressure		bar	2
Supply voltage		V/A DC	20 ...28 / 0.8
Admissible temperature	operation	°C	+0 ... +50
	bakeout at flange, without electronics	°C	80
Filament		-	Dual Y_2O_3 coated Ir
Materials exposed to vacuum		-	Y_2O_3 , Ir, Pt, Mo, Cu, W, NiFe, NiCr, Stainless Steel, glass

(1) Reduced accuracy during degas.

Spare parts: Replacement sensor DN 25 KF, DN 40 CF-R.

Accessories:

- Baffle: Prevents contamination of the sensor. (Easy installation into the vacuum connection - No tools required.)
- Power supply 24 V DC / RS232C line.

TRIPLEGAUGE® BCG450

The INFICON Bayard-Alpert Pirani Capacitance Diaphragm Gauge, BCG450, combines the advantages of three different technologies in a single, compact package to measure process and base pressure from $5 \cdot 10^{-10}$ to 1500 mbar. The BCG450 is designed to take the place of three sensors (hot ion, convection enhanced Pirani and vacuum switch).



TripleGauge® BCG450

ADVANTAGES

- Gas-type-independent pressure measurement above 10 Torr provides more reliable loadlock control for any gas mixture.
- Pirani interlock protects the hot filament from premature burnout.
- Automatic high vacuum Pirani adjustment reduces operator interventions.
- Differential pressure measurement at atmosphere eliminates uncertainty related to atmospheric pressure changes.
- Easy-to-exchange sensing element with on-board calibration data guarantees reproducibility.
- Options: LCD display, Profibus DP, DeviceNet™, RS485.

Available in: DN 25 KF, DN 40 CF-R.

SPECIFICATIONS

		Units	BCG450
Measurement range		mbar	$5 \cdot 10^{-10}$ to 1500
Accuracy	$10^{-8} \dots 10^{-2}$ mbar	% of reading	±15 %
	$10^{-2} \dots 50$ mbar	% of reading	±15 %
	50 ... 950 mbar	% of reading	±5 %
	950 ... 1050 mbar	% of reading	±2.5 %
Repeatability	$10^{-8} \dots 10^{-2}$ mbar	% of reading	5
Degas ⁽¹⁾	$p < 7.2 \cdot 10^{-6}$	mbar	Electron bombardment, max. 3 min
Admissible pressure		bar	5
Supply voltage		V/A DC	20 ... 28/0.8
Admissible temperature	operation	°C	+0 ... +50
	bakeout	°C	80 at flange, 150 electronics removed
Materials exposed to vacuum			Y_2O_3 , Ir, Mo, Cu, W, NiFe, NiCr, Al_2O_3 , SnAg, Stainless Steel, glass

(1) Reduced accuracy during degas.

Spare parts: replacement sensor DN 25 KF, DN 40 CF-R.

Accessories:

- Baffle: Prevents contamination of the sensor (Easy installation into the vacuum connection - no tools required).
- Centering ring with baffle.
- Power supply 24 V DC / RS232C line.

Bayard-Alpert Gauges

Neyco offers three types of Bayard-Alpert ionization gauges: glass-tubulated, nude, and nude-UHV Bayard-Alpert ionization gauges. All these gauges are specifically developed for high and ultra-high vacuum applications, and offer high performance over a pressure range $2 \cdot 10^{-10}$ to 10^{-3} mbar ($2 \cdot 10^{-11}$ mbar for nude UHV gauges).

FILAMENTS

- Twin Tungsten
- Single or twin Thoria-coated Iridium (Thoriated Ir)
- Replaceable filament assemblies

ADVANTAGES

- Dual-filament assemblies provide security against filament burnout (the second acting as a spare).
- Thoriated Iridium filament:
 - high tolerance to accidental exposure to atmosphere,
 - relatively immune to Oxygen,
 - lower reaction rate to chemical reaction.
- Closed-end cage: lower X-ray limit (the lowest pressure that can be measured).

X-RAY LIMIT

In ionization gauges, X-rays generated by the ionizing electrons hitting the grid produce a photoelectric emission at the ion collector. This causes a lower limit of pressure readings known as the X-ray limit.



Glass encapsulated BA gauge

SPECIFICATIONS

TYPE	P/N	OPERATING PRESSURE (mbar)	FILAMENT	SENSITIVITY (mbar ⁻¹ , N ₂)	BASE TYPE	X-RAY LIMIT (mbar N ₂)
Glass encapsulated	JBATIR JBAW	3.10 ⁻¹⁰ to 10 ⁻³	Thoriated Ir Twin Tungsten	10	Kovar Glass DN 25 KF DN 40 KF DN 40 CF	3.10 ⁻¹⁰
Glass encapsulated	IGH9	3.10 ⁻¹⁰ to 10 ⁻³	Twin Thoriated Ir	9	Glass on DN 40 CF	3.10 ⁻¹⁰
Nude	VIG32NTIR	3.10 ⁻¹⁰ to 10 ⁻³	Twin Thoriated Ir	13	Glass on 40 CF	3.10 ⁻¹⁰
	IGH8/IR	3.10 ⁻⁹ to 10 ⁻³	Replaceable single Thoriated Ir	8	Metal / Glass bead on 40 CF	5.10 ⁻¹⁰
	IGH8T/W	3.10 ⁻⁹ to 10 ⁻³	Replaceable twin Tungsten	8	Metal / Glass bead on CF	5.10 ⁻¹⁰
	IGH11/W	5.10 ⁻¹¹ to 10 ⁻³	Replaceable twin Tungsten	17	Ceramic on 40 CF	5.10 ⁻¹¹
Nude with pin shield	274041 274042	3.10 ⁻¹¹ to 10 ⁻³	Replaceable twin Tungsten or twin Thoriated Ir (closed-end cage)	25	40 CF	3.10 ⁻¹¹
	274043	5.10 ⁻¹⁰ to 10 ⁻³	Replaceable single Thoriated Ir (non-sag bifilar grid)	10	40 CF	5.10 ⁻¹⁰

For self-aligning
locking connector
(Granville-Phillips)



SPARE PARTS

- Replacement filament kits

ACCESSORIES

- Push-on-pins cables
- Self-aligning locking cables
for Granville-Phillips gauges

Vacuum Gauges Controllers

CONTROLLERS VGC401 / 402 / 403

The VGC 400 series controllers are compatible with four measurement principles - hot cathode, cold cathode, Pirani and capacitance diaphragm gauges. They can monitor the entire pressure range from 10^{-10} to 1500 mbar.



Controllers VGC401 / 402 / 403

ADVANTAGES

- Firmware upgrades available on-line are easily downloaded via the RS232 interface.
- Programmable 0 to 10 V chart recorder output with logarithmic / linear characteristics for each gauge or gauge combination (VGC402 / 403 only).
- High resolution - 16 Bit A/D converter.
- Automatic identification of the connected INFICON gauges.
- User selectable measurement unit (mbar, Torr, Pascal, micron).
- Up to six adjustable setpoints with adjustable hysteresis may be assigned to any channel.
- Versatile, compact bench-top model design can easily be mounted in a panel or 19" rack.
- Widerange power supply 90 to 250 V, 50 to 60 Hz.
- Degas function for Bayard-Alpert gauges.

SPECIFICATIONS

	VGC401	VGC402	VGC403
Measurement channels	1	2	3
Range (mbar)	$2 \cdot 10^{-10}$ to 1500	$5 \cdot 10^{-10}$ to 1500	$5 \cdot 10^{-10}$ to 1500
Measurement unit (selectable)	mbar, Torr, Pascal, micron		
Setpoint relays	1	4	6
Interface (digital)	RS 232 C		
Operation temperature (°C)	5 ... 50		

Accessories: cables from 3 to 30 m (specify the gauge type).

UHV IONIZATION GAUGE CONTROLLER

The 307 GRANVILLE PHILLIPS controller measures pressure, and utilizes pressure-related outputs to control a variety of vacuum system functions and processes. To fit a wide range of needs and applications, the 307 controller is available in a variety of configurations.

Pressure range: 2.10^{-11} mbar to 10^{-3} mbar.



UHV Ionization Gauge Controller

The basic controller is configured as follows:

- operates a Series 274 Bayard-Alpert ionization gauge
- 3-line display
- sequential operation of a second ionization gauge
- remote input/output interface
- resistive degas or election bombardment degas (UHV electrometer, reads to 2.10^{-11} Torr)

OPTIONS

- Interface: RS-232 / RS-485 / IEE-488 / Linear analog output
- Gauges: dual Convectron / Convectron-Capacitance Diaphragm / dual Thermocouple
- Setpoints: 2 for ion gauge / 6, 2 per channel / 6, user configurable
- Measurement units: Torr / mbar / Pa
- Mount: left mount, side-by-side with power supply for 19-inch rack / Half-rack mount, remote power supply



Gas Dosing Systems

CONTROL VALVE VDM005A-X

ADVANTAGES

- Fast response time.
- High reproducibility and repeatability.
- Stainless Steel housing.
- Closes automatically in case of power failure.
- Smooth solenoid drive.
- Optional flange connection.
- Very compact design.

Available in: M14x1, pipe 6 mm, pipe 1/4", DN 10 KF.



Control Valve VDM005A-X

SPECIFICATIONS

Control range		1... 100% FS*
Pressure range		1.10 ⁻⁸ mbar
Pressure max. in closing direction		2 bar
Actuator		Solenoid
Type (sccm)		10, 50, 100, 500, 1000, 5000
Response time		< 30 ms
Temperature		5 ... 50°C
Supply		0 ... 24 V DC
Materials	housing	Stainless Steel
	seals	FPM

* Full scale

CONTROL VALVE VDE016-X

ADVANTAGES

- Broad control range.
- Excellent reproducibility.
- Status information and commands via digital interface.
- Withstands corrosive gases - Stainless Steel / FPM.
- Combined with the VCC500-Z controller, the valve closes automatically in case of a power failure.

Available in: DN 16 KF.



Control Valve VDE016-X

SPECIFICATIONS

Gas flow, controllable	min.	5.10 ⁻⁶ mbar.l/s
	max.	1250 mbar.l/s
Pressure absolute	min.	1.10 ⁻⁶ mbar
	max.	2.5 bar
Actuator		Stepper motor
Closing / opening time		3 / 4 s
Temperature		5 ... 40°C
Supply		24 V DC / 12 VA
Materials	housing	Stainless Steel
	dosing sleeve	Fluorplastomer
	seals	FPM

CONTROLLER VCC500-Z

This controller is used with an Inficon Capacitance Diaphragm gauge and the Control valve VDE016-X to control pressure in the vacuum system.

ADVANTAGES

- 2 operating modes: pressure control or gas flow adjustment.
- Simple operation - user friendly LCD display and function key.
- Analog/digital inputs, outputs and interfaces.
- 99 PI pre-programmed control adjustments for quick and easy operation.
- Adjustable PID control algorithm.
- Wide variety of pre-programmed pressure gauges.



Controller VCC500-Z

SPECIFICATIONS

Analog input	0 ... 10 V DC nominal pressure, gas flow
Analog output	0 ... 10 V DC pressure, valve position
8 available digital inputs	Flow adjustment, opening/closing the valve, switching between pressure and gas flow control
8 available digital outputs	Valve position indication, setpoint status reached, status messages - sensor, valve, pressure control upstream and downstream
Interfaces	RS232C, RS485
Control accuracy	5 % FS* sensor
Display accuracy	0.2 % FS* sensor
Supply voltage	90 ... 250 V AC

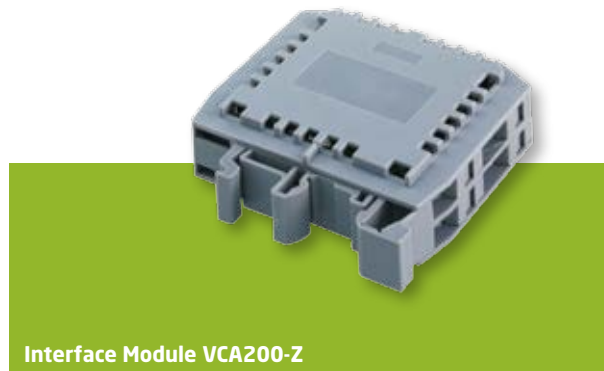
* Full scale

INTERFACE MODULE VCA200-Z

This module connects an RS232C interface (PC, IPC, PLC, MC) to the digital interface of the Control Valve VDE016-X.

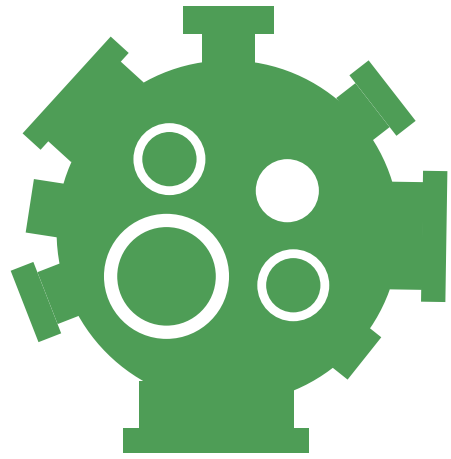
ADVANTAGES

- Easy and economic system integration.
- Inquiry of status and valve position.



SPECIFICATIONS

Interface	RS232C
Supply	24 VDC / 0.5 A
Installation	DIN mounting rail (symmetric or asymmetric)
Temperature	5 ... 50°C



VACUUM CHAMBERS

- Drawing Office C 03
- Manufacturing Capabilities C 04
- Processing and Testing C 06
- Cleaning C 07
- Assembly C 08

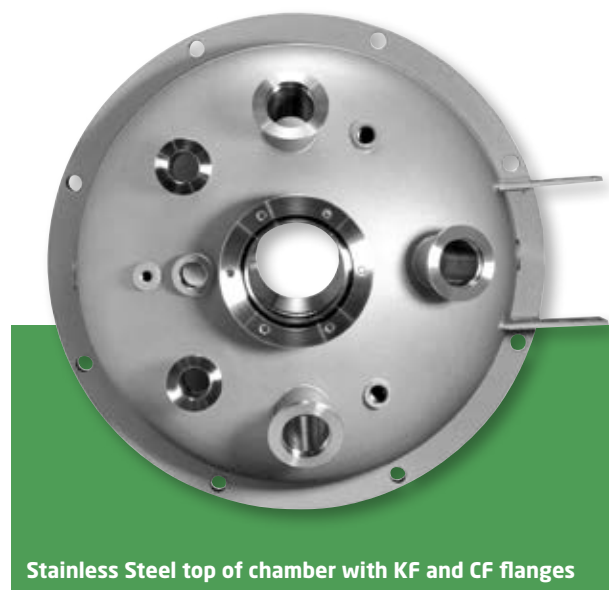
Neyco is expert in the manufacture of special components and chambers direct from:

- **your own drawings**
- **specific data**
- **verbal instructions**

Where required our Technical Support Engineer's experience is available to you, ensuring we produce the correct design for your application.

Our comprehensive manufacturing facilities means we can custom build any vacuum chamber whilst ensuring the highest quality standards. Large capacity machining centres and handling equipment are also available for the fabrication of special vacuum assemblies and chambers of up to two meters diameter.

Our factory is fully equipped to fabricate complete systems for high and ultra-high vacuum applications.



Stainless Steel top of chamber with KF and CF flanges

MATERIALS

- Stainless Steel 304L
- Stainless Steel 316L
- Aluminum alloy 6061 T6



Aluminum vacuum chamber machined from solid plate

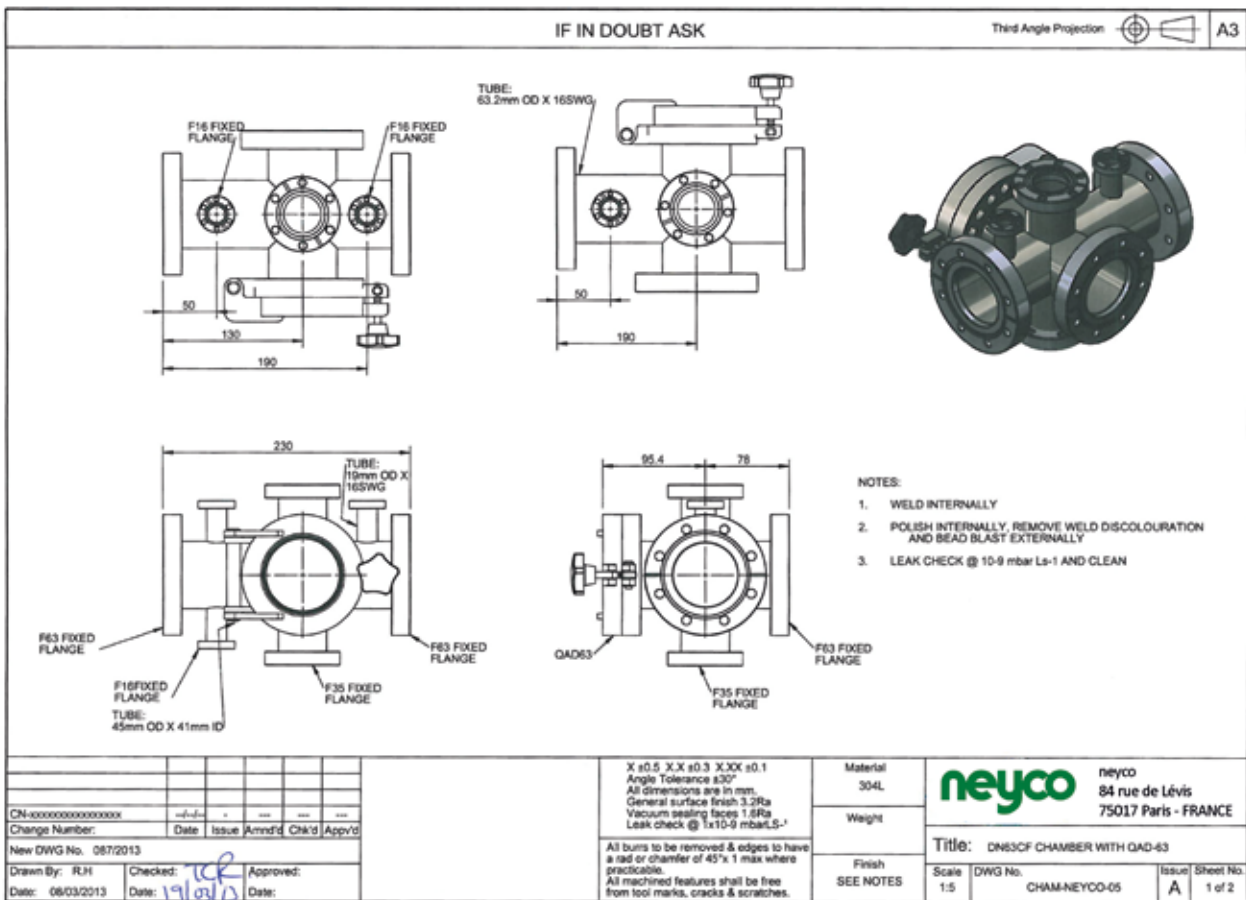


Lightweight Aluminum vacuum chamber

Drawing Office

Our highly experienced drawing office will produce engineering drawings of your proposed custom products based on your requirements and specification. Or if

available we can work from supplied drawings. An experienced vacuum system specialist will be in contact to discuss your needs on request.



Manufacturing Capabilities

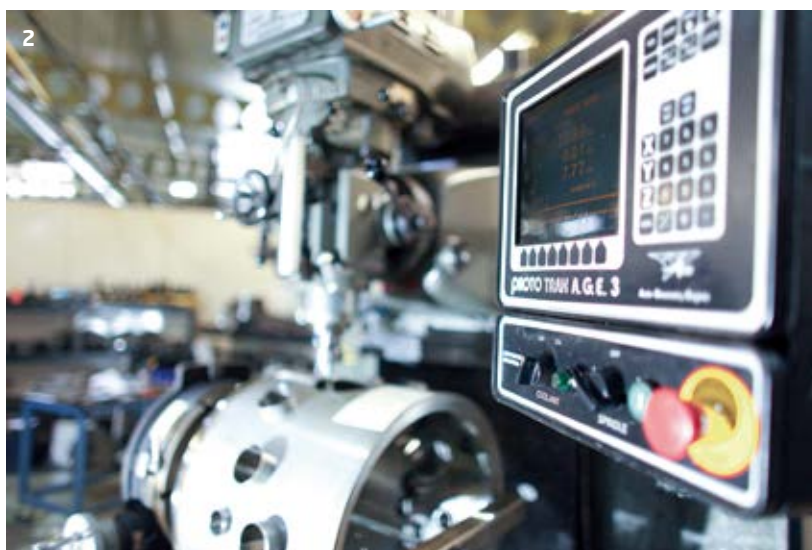
We are able to supply one off specials ranging from a standard part with an additional port configuration to multi-port chambers up to two meters diameter, utilising large capacity machining centers and handling equipment for the fabrication of special vacuum assemblies and chambers.

We can supply one off's on demand or manufacture and supply specials on a regular basis for high and ultra-high vacuum applications.

All our components and chambers are manufacturing according UHV requirements:

- Internal TIG welding
- General surface finish Ra 3.2
- Vacuum sealing faces: Ra 1.6 to 0.8
- External bead blast or electropolished
- He leak test control (down to 1.10^{-10} mbar.l.s⁻¹)

1, 2, 3 during manufacturing





→
TIG welding example

Processing and Testing

All chambers undergo thorough processing and testing during and after manufacture and are 100% independently inspected. We have the ability to produce plotted inspection reports using our measuring arm and associated software, on request.

Smaller items can be checked on our CMM, inspection printout which is also available on request.



Cleaning

Cleaned to HV or UHV application, with cleaning through our automated cleaning plants or with a hot steam wash process and air bake as standard. Baking facilities, up to two meters diameter. On request, we can blank off the chambers, pump and bake under vacuum with RGA printout supplied.

Our UHV cleaning procedure offers ready to use chambers and components with KF, ISO and CF flanges.



Stainless Steel chamber with CF flanges

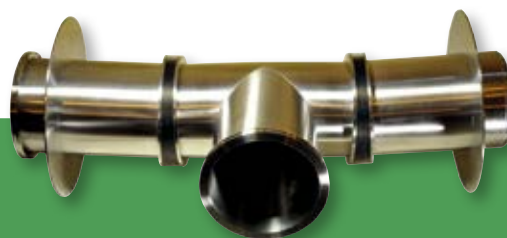
Assembly

Precision port alignment for analysis chambers, integral cooling coils and all required components, such as electrical feedthroughs, manipulation equipment and

gauges can be pre-assembled and tested. Fully pumped, tested, bench mounted chamber assemblies can be built to customer specifications.



Stainless Steel chamber with KF flanges and glass dome, external bead blast



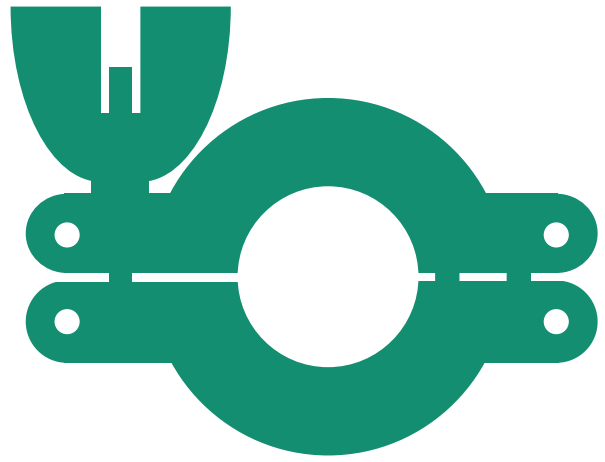
ISO flange fitting with welded bellows, external electropolished



Stainless Steel chamber with quick access door



CF flange fitting with electrical feedthrough



VACUUM KF COMPONENTS

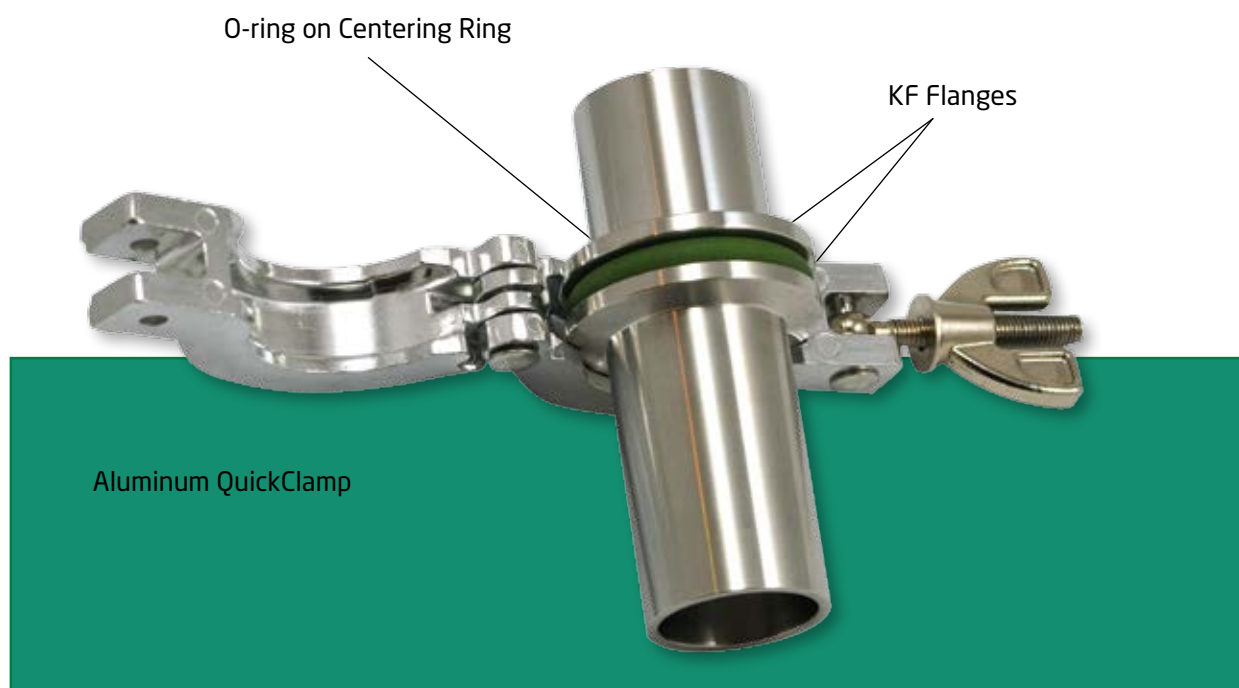
- Clamps and Seals D 03
- Flanges and Connectors D 09
- Adaptors.....D 12
- Elbows, Tees and CrossesD 20
- Bellows and Hoses.....D 24

KF flanges utilize an Aluminum clamp with a single wingnut fastener allowing frequent disassembly without tools. The vacuum seal is effected by uniform application of pressure by the clamp on the 15° surface of the flange. The mating flange surfaces compress an "O"-ring (held in place by a metal centering ring) to produce a seal that can be used in vacuum applications down to 10^{-7} mbar and baked to 200°C (sustained to 150°C), for Viton O-ring.

The KF range of flanges and fittings are manufactured from high quality 316L (1.4404) Stainless Steel*. Some items are also available in Aluminum.

All given dimensions are nominal in mm.

*304L (1.4407) available on request.

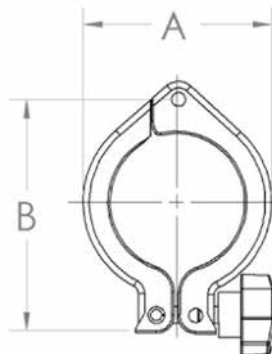


Clamps and Seals

KF QUICK CLAMP - ALUMINUM

P/N	DN	A	B
KF16C	16	40	64
KF25C	25	50	74
KF40C	40	65	89
KF50C	50	87	109

Pressure range 10 mbar to 10 bar.
 Temperature range -10 to 200°C.



KF NON MAGNETIC QUICK CLAMP

P/N	DN	TO FIT FLANGE OD
KF16ACU	16	30
KF25ACU	25	40
KF40ACU	40	55
KF50ACU	50	75

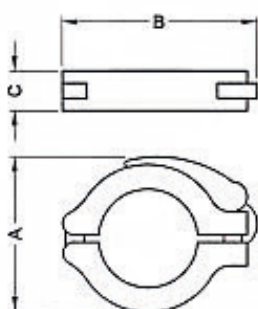
Temperature range -10 to 125°C.
 Material : Aluminum + Stainless Steel



KF RAPID FASTENING CLAMP

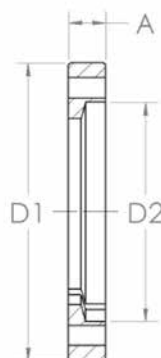
P/N	SPRING	LEVER	DN	A	B	C
KF10/16RFC KF10/16RFCS	Steel Stainless Steel	Polyamide Aluminum	10/16	52 52	70 71	16 16
KF20/25RFC KF20/25RFCS	Steel Stainless Steel	Polyamide Aluminum	20/25	61 61	81 72	16 16
KF32/40RFC KF32/40RFCS	Steel Stainless Steel	Polyamide Aluminum	32/40	75 78	98 99	16 18

Clamping ring half : aluminum.



BULKHEAD CLAMP - ALUMINUM

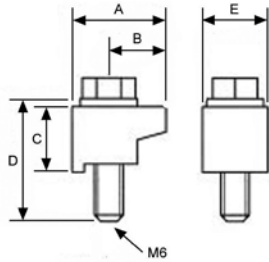
P/N	DN	A	D1	D2
BHC16	16	9.2	50.8	30
BHC25	25	9.8	60.3	40
BHC40	40	9.3	74.6	55
BHC50	50	10.3	95.2	75



KF CLAW GRIP

P/N	DN	A	B	C	D	E	SET OF
KF10/50WC	10 - 50	19.5	11.5	12.5	20	14	4 pcs

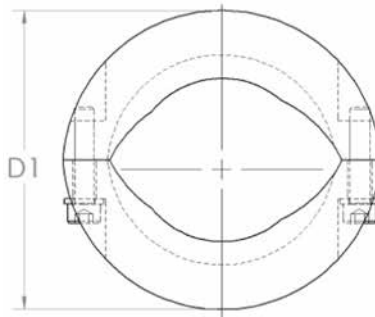
Claw: aluminum.
Screw & washer: Stainless Steel.



KF METAL SEAL CLAMP - STAINLESS STEEL

P/N	DN	D1	ID
KF10/16MSC	10/16	54	22
KF20/25MSC	20/25	64	32
KF32/40MSC	32/40	82	47
KF50MSC	50	112	62

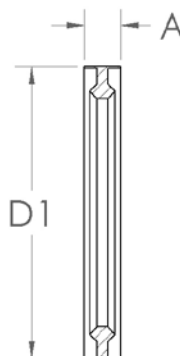
304L Stainless Steel.
Pressure range 10^{-8} mbar to 3 bar.



KF METAL SEAL - ALUMINUM

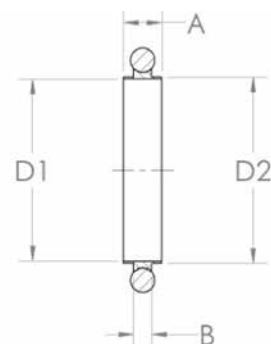
P/N	DN	D1	A
KF10/16MS	10/16	32	7
KF20/25MS	20/25	42	7
KF32/40MS	32/40	57	7
KF50MS	50	77	7

Pressure range 10^{-8} mbar to 3 bar.



KF CENTERING RINGS

P/N	DN	A	B	D1	D2
KF16--CR	16	8	3.9	16	17
KF25--CR	25	8	3.9	25	26
KF40--CR	40	8	3.9	40	41
KF50--CR	50	8	3.9	50	52



P/N	MATERIALS	TEMPERATURE RANGE
--SVCR	316L Stainless Steel / green Viton	-10 to 200°C (sustained 150°C)
--SNCR	316L Stainless Steel / Nitrile	-10 to 100°C
--AVCR	Aluminum / green Viton	-10 to 200°C (sustained 150°C)
--ANCR	Aluminum / Nitrile	-10 to 100°C



Pressure range 10^{-7} mbar to 1 bar.

KF ADAPTER CENTERING RINGS

P/N	DN	A	B	D1	D2
KF10/16--RCR	16	8	3.9	17	12
KF20/25--RCR	25	8	3.9	26	22
KF32/40--RCR	40	8	3.9	41	34



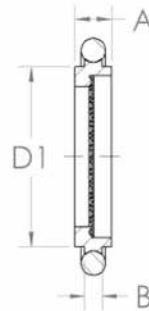
P/N	MATERIALS	TEMPERATURE RANGE
--VRCR	316L Stainless Steel / green Viton	-10 to 200°C (sustained 150°C)
--SNRCR	316L Stainless Steel / Nitrile	-10 to 100°C



Pressure range 10^{-7} mbar to 1 bar.

CENTERING RING WITH MESH SCREEN

P/N	DN	A	B	D1
KF16MCRV	16	8	3.9	17
KF25MCRV	25	8	3.9	26
KF40MCRV	40	8	3.9	41
KF50MCRV	50	8	3.9	52



Stainless Steel centering ring with 72 mesh screen (0.5 x 0.5 x 1.0mm).

Pressure range 10⁻⁷ mbar to 1 bar.

Temperature range -10 to 200°C (sustained 150°C).

CENTERING RING WITH FILTER

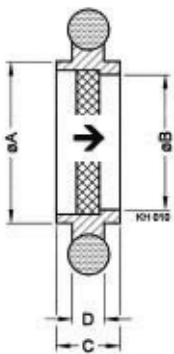
P/N	DN	A	B	C	D	Pore Size (mm)	E ⁽¹⁾ (m ³ /h)
KF10MCRF02 KF10MCRF04	10	12	8 9	8	3.9	0.02 0.004	0.5 -
KF16MCRF02 KF16MCRF04	16	17	14 13	8	3.9	0.02 0.004	1.2 -
KF25MCRF02 KF25MCRF04	25	26	23 22	8	3.9	0.02 0.004	4.2 -
KF40MCRF02 KF50MCRF04	40	41	38 35.5	8	3.9	0.02 0.004	11.3 -
KF50MCRF02 KF50MCRF04	50	52	48 45.7	8	3.9	0.02 0.004	18.1 -

(1) Air at 0°C, 20 mbar differential pressure.

Centering ring: Stainless Steel.

Seal: Viton.

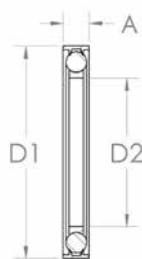
Filter: Stainless Steel 316L.



→ Recommended gas flow direction.

TRAPPED CENTERING RING

P/N	DN	A	D1	D2
KF16TCRV	16	7	31.5	16
KF25TCRV	25	7	41.5	25
KF40TCRV	40	7	56.5	40
KF50TCRV	50	7	77.5	50



Aluminum outer, Stainless Steel inner.

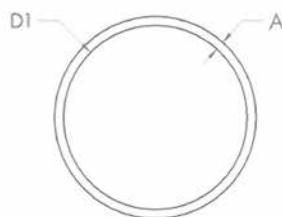
Seal: Viton.

Pressure range 10^{-7} mbar to 10 bar.

Temperature range -10 to 200°C (sustained 150°C).

O-RING - VITON / NITRILE

P/N	DN	MATERIAL	A	D1
KF16VR KF16NR	16	Viton Nitrile	5	18
KF25VR KF25NR	25	Viton Nitrile	5	28
KF40VR KF40NR	40	Viton Nitrile	5	42
KF50VR KF50NR	50	Viton Nitrile	5	55

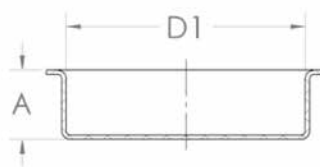


Pressure range 10^{-7} mbar to 1 bar absolute.

Flanges and Connectors

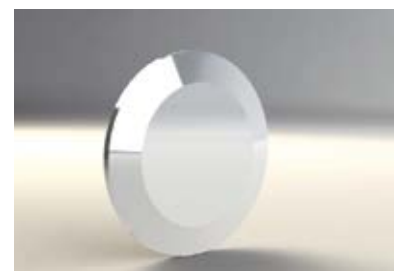
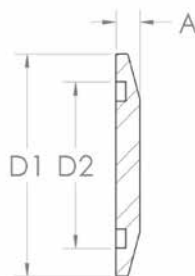
FLANGE CAPS - PLASTIC

P/N	DN	PACK SIZE	A	D1
KF16CAP	16	10	11	30
KF25CAP	25	10	11	40
KF40CAP	40	10	11	55
KF50CAP	50	10	11	75



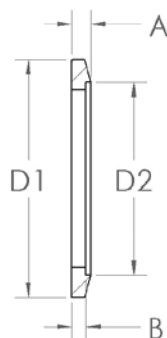
BLANK FLANGE

P/N	DN	MATERIAL	A	D1	D2
KF16BS KF16BA	16	Stainless Steel Aluminum	6	30	17.2
KF25BS KF25BA	25	Stainless Steel Aluminum	6	40	26.2
KF40BS KF25BA	40	Stainless Steel Aluminum	6	55	41.2
KF50BS KF50BA	50	Stainless Steel Aluminum	6	75	52.2



BORED FLANGE - STAINLESS STEEL

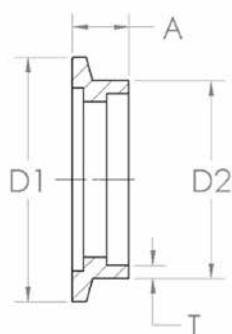
P/N	DN	A	B	D1	D2
KF16B16	16	4.3	3.3	30	20.0
KF16B19	16	4.3	3.3	30	19.05
KF25B24	25	4.6	3.5	40	28.0
KF25B25	25	4.6	3.5	40	25.4
KF40B38	40	4.4	3.3	55	38.1
KF40B41	40	4.4	3.3	55	44.5
KF50B50	50	5.4	4.4	75	50.8
KF50B51	50	5.4	4.4	75	57.0



Special bores are available on request.

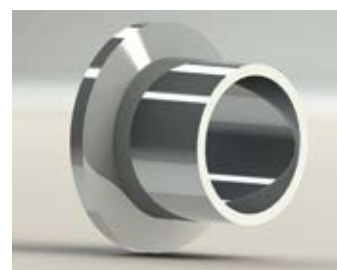
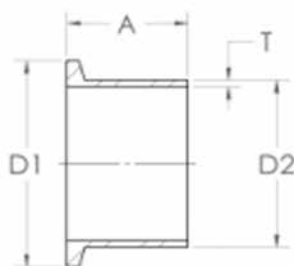
SOCKET WELD FLANGE - STAINLESS STEEL

P/N	DN	A	D1	D2	T
KF16W11	16	12.7	30	15.5	1.25
KF16W	16	12.7	30	22.1	1.40
KF25W	25	12.7	40	28.6	1.35
KF40W	40	12.7	55	44.5	2.95
KF50W	50	12.7	75	57.2	2.95



TUBULATION SHORT WELD FLANGE - STAINLESS STEEL

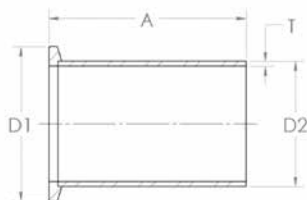
P/N	DN	A	D1	D2	T
TU16KS	16	30.0	30	20.0	2.0
TU25KS	25	30.0	40	28.0	2.0
TU40KS	40	30.0	55	44.5	1.6
TU50KS	50	30.0	75	57.0	3.0
TU16KSUS	16	12.7	30	19.1	1.7
TU25KSUS	25	12.7	40	25.4	1.7
TU40KSUS	40	19.0	55	38.1	1.7
TU50KSUS	50	19.0	75	50.8	1.7



Special lengths and diameters are available on request.

TUBULATION LONG WELD FLANGE - STAINLESS STEEL

P/N	DN	A	D1	D2	T
TU16KL	16	70	30	20.0	2.0
TU25KL	25	70	40	28.0	2.0
TU40KL	40	70	55	44.5	1.6
TU50KL	50	70	75	57.0	3.0
TU16KLUS	16	40	30	19.1	1.7
TU25KLUS	25	40	40	25.4	1.7
TU40KLUS	40	40	55	38.1	1.7
TU50KLUS	50	40	75	50.8	1.7

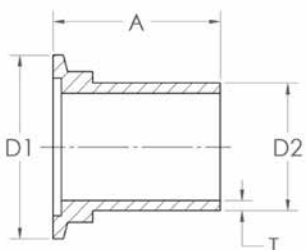


D

Special lengths and diameters are available on request.

HOSE ADAPTER - STAINLESS STEEL

P/N	DN	A	D1	D2	T
KF16TUH12	16	32.0	30	12.7	1.70
KF16TUH	16	32.0	30	19.1	1.55
KF25TUH	25	38.1	40	25.4	1.70
KF40TUH	40	50.0	55	38.1	1.70
KF50TUH	50	55.0	75	50.8	1.70



Special lengths and diameters are available on request.

➔ See Section D - KF Components
- Bellows and Hoses in this catalogue about PVC Hose.

STRAIGHT CONNECTOR - STAINLESS STEEL

P/N	DN	A	D1	D2	T
SC16K	16	80	30	20.0	2.0
SC25K	25	100	40	28.0	2.0
SC40K	40	130	55	44.5	1.6
SC50K140	50	140	75	57.0	3.0

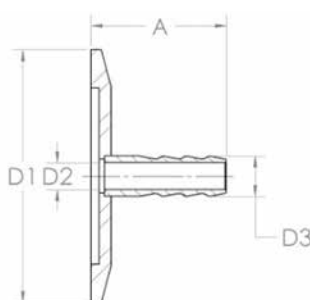


Special lengths and diameters are available on request.

Adaptors

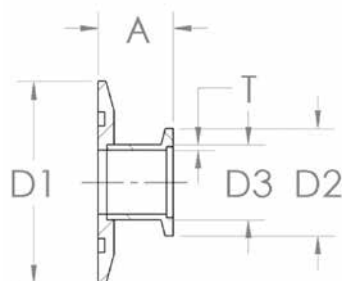
HOSE NOZZLE CONNECTOR - STAINLESS STEEL

P/N	DN	A	D1	D2	D3
KF16HNS	16	40	30	7	12
KF25HNS	16	40	40	7	12
KF40HNS	40	40	55	7	12
KF50HNS	50	40	75	7	12



REDUCER ADAPTOR - STAINLESS STEEL

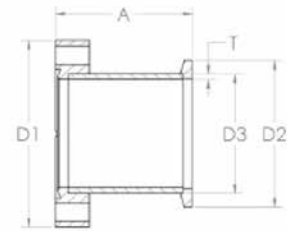
P/N	DN	A	D1	D2	D3	T
KF25R16	25/16	28	40	30	20.0	2
KF40R16	40/16	28	55	30	20.0	2
KF50R16	50/16	28	75	30	20.0	2
KF40R25	40/25	28	55	40	28.0	2
KF50R25	50/25	28	75	40	28.0	2
KF50R40	50/40	28	75	55	44.5	2



Special lengths are available on request.

KF TO CF REDUCER ADAPTOR - STAINLESS STEEL

P/N	DN	A	D1	D2	D3	T
KA1616	CF16/16	36	34	30	20.0	2
KA3516	CF35/16	36	70	30	20.0	2
KA3525	CF35/25	36	70	40	28.0	2
KA3540	CF35/40	50	70	55	44.5	2
KA6325	CF63/25	50	114	40	28.0	2
KA6340	CF63/40	50	114	55	44.5	2
KA6350	CF63/50	50	114	75	57.0	3
KA1025	CF100/25	50	152	40	28.0	2
KA1040	CF100/40	50	152	55	44.5	2
KA1050	CF100/50	50	152	75	57.0	3
KA1525	CF150/25	70	203	40	28.0	2
KA1540	CF150/40	70	203	55	44.5	2
KA1550	CF150/50	70	203	75	57.0	3

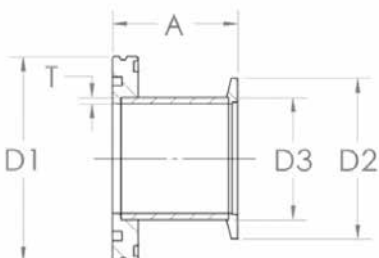


Special lengths are available on request.

ISO TO KF ADAPTOR - STAINLESS STEEL

P/N	DN	A	D1	D2	D3	T
SK6325	ISO63/25	50	95	40	28.0	2
SK6340	ISO63/40	50	95	55	44.5	2
SK6350	ISO63/50	50	95	75	57.0	3
SK1025	ISO100/25	50	130	40	28.0	2
SK1040	ISO100/40	50	130	55	44.5	2
SK1050	ISO100/50	50	130	75	57.0	3

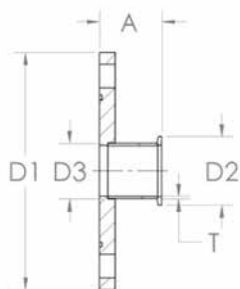
Special lengths are available on request.



ASA TO KF ADAPTOR - STAINLESS STEEL

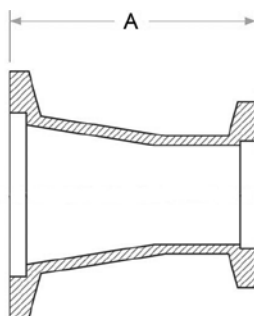
P/N	DN	A	D1	D2	D3	T
KASA4038G	ASA1.5"/40	46	127	55	44.5	2
KASA4050G	ASA2.0"/40	46	152	55	44.5	2
KASA4075G	ASA3.0"/40	46	191	55	44.5	2
KASA5038G	ASA1.5"/50	46	127	75	57.0	3
KASA5050G	ASA2.0"/50	46	152	75	57.0	3
KASA5075G	ASA3.0"/50	46	191	75	57.0	3

With O-ring groove.



CONICAL REDUCER ADAPTOR - STAINLESS STEEL

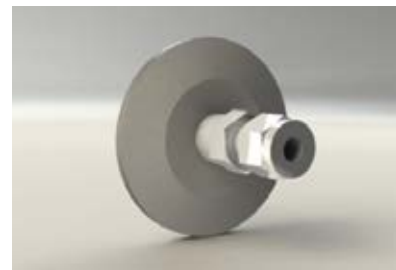
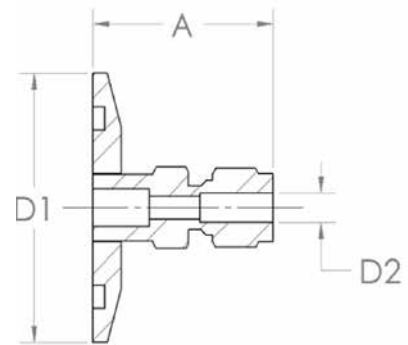
P/N	DN	A
KF25CR16	25/16	40
KF40CR16	40/16	40
KF50CR16	50/16	40
KF40CR25	40/25	40
KF50CR25	50/25	40
KF50CR40	50/40	40



Special lengths are available on request.

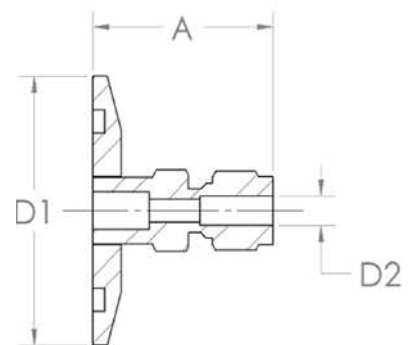
KF TO METRIC PIPE ADAPTOR - STAINLESS STEEL

P/N	DN	A	D1	D2
KSWA164	16	35	30	4
KSWA166	16	37	30	6
KSWA168	16	38	30	8
KSWA1610	16	45	30	10
KSWA1612	16	47	30	12
KSWA1616	16	53	30	16
KSWA254	25	35	40	4
KSWA256	25	37	40	6
KSWA258	25	38	40	8
KSWA2510	25	45	40	10
KSWA2512	25	47	40	12
KSWA2516	25	53	40	16
KSWA404	40	35	55	4
KSWA406	40	37	55	6
KSWA408	40	38	55	8
KSWA4010	40	45	55	10
KSWA4012	40	47	55	12
KSWA4016	40	53	55	16



KF TO IMPERIAL PIPE ADAPTOR - STAINLESS STEEL

P/N	DN	A	D1	D2
KSWA163	16	31	30	1/8"
KSWA167	16	38	30	1/4"
KSWA169	16	40	30	3/8"
KSWA1613	16	53	30	1/2"
KSWA253	25	34	40	1/8"
KSWA257	25	38	40	1/4"
KSWA259	25	40	40	3/8"
KSWA2513	25	53	40	1/2"
KSWA2519	25	54	40	3/4"
KSWA2525	25	66	40	1"
KSWA403	40	34	55	1/8"
KSWA407	40	36	55	1/4"
KSWA409	40	40	55	3/8"
KSWA4013	40	53	55	1/2"
KSWA4019	40	54	55	3/4"
KSWA4025	40	66	55	1"



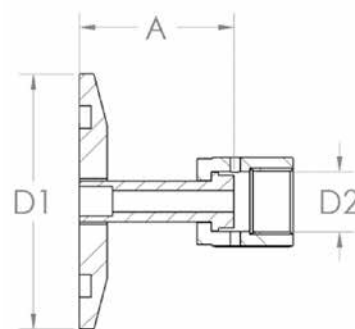
KF TO MALE VCR ADAPTOR - STAINLESS STEEL

P/N	DN	A	D1	D2	VCR
KVCR166M	16	35.6	30	4.8	1/4"
KVCR1613M	16	41.4	30	10.4	1/2"
KVCR256M	25	35.6	40	4.8	1/4"
KVCR2513M	25	40.6	40	10.4	1/2"
KVCR2519M	25	54.4	40	15.7	3/4"
KVCR406M	40	35.6	55	4.8	1/4"
KVCR4013M	40	40.6	55	10.4	1/2"
KVCR4019M	40	53.3	55	15.7	3/4"
KVCR506M	50	35.6	75	4.8	1/4"
KVCR5013M	50	40.6	75	10.4	1/2"
KVCR5019M	50	53.3	75	15.7	3/4"



KF TO FEMALE VCR ADAPTOR - STAINLESS STEEL

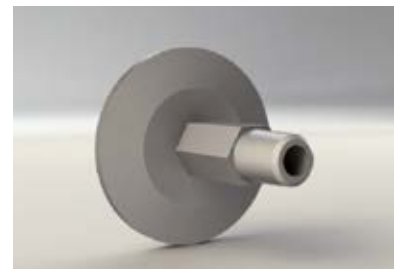
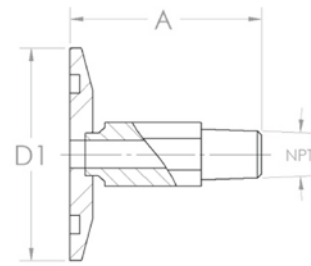
P/N	DN	A	D1	D2
KVCR166F	16	35.6	30	1/4"
KVCR1613F	16	40.5	30	1/2"
KVCR256F	25	35.6	40	1/4"
KVCR2513F	25	40.6	40	1/2"
KVCR2519F	25	54.4	40	3/4"
KVCR406F	40	35.6	55	1/4"
KVCR4013F	40	40.6	55	1/2"
KVCR4019F	40	53.3	55	3/4"
KVCR506F	50	35.6	75	1/4"
KVCR5013F	50	40.6	75	1/2"
KVCR5019F	50	53.3	75	3/4"



KF to BSP adaptors are available on request (conical or BSP-P).

KF TO MALE-NPT PIPE ADAPTOR - STAINLESS STEEL

P/N	DN	A	D1	NPT
KNPT163	16	40	30	1/8"
KNPT166	16	50	30	1/4"
KNPT253	25	40	40	1/8"
KNPT256	25	50	40	1/4"
KNPT2513	25	75	40	1/2"
KNPT2519	25	75	40	3/4"
KNPT406	40	50	55	1/4"
KNPT4013	40	75	55	1/2"
KNPT4019	40	75	55	3/4"
KNPT4025	40	75	55	1"
KNPT506	50	50	75	1/4"
KNPT5013	50	75	75	1/2"
KNPT5019	50	75	75	3/4"
KNPT5025	50	75	75	1"



DOUBLE RING FITTINGS - STAINLESS STEEL

The double ring fitting makes considerably easier all assembling of tubing which has to remain tight under extreme pressure, vacuum or vibration conditions as well as under thermal shock.

Double ring fitting consists of a body, a nut and front and rear rings (or ferrules). The pressure applied by the nut during torquing squeezes both rings one against the other and against the tube which ensures optimal tightness.

Pressure range: 2.5 bar to 10⁻⁹ mbar.

	FOR OD TUBE	
Double straight unions		
Equal elbows		
Equal tees	3 mm 4 mm 6 mm 8 mm 10 mm 1/8" 1/4" 1/2"	
Reduction		
Front and rear rings		

Tube

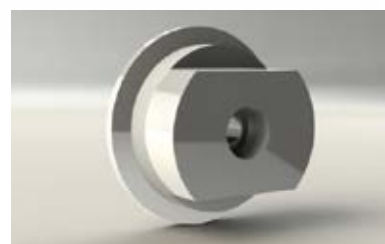
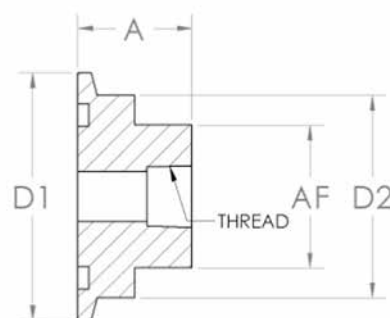
Neyco offers a large variety of Outside diameters and lengths on seamless tubes, in 304L or 316L Stainless Steel.



KF TO FEMALE-NPT PIPE ADAPTOR - STAINLESS STEEL

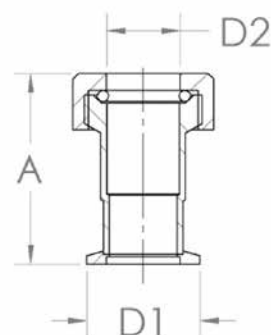
P/N	DN	A	AF	D2	D2	THREAD
KNPT163F	16	19.1	15.8	30	20	1/8"
KNPT166F	16	19.1	15.8	30	20	1/4"
KNPT253F	25	19.1	22.4	40	28	1/8"
KNPT256F	25	19.1	22.4	40	28	1/4"
KNPT403F	40	25.4	31.8	55	45	1/8"
KNPT406F	40	25.4	31.8	55	45	1/4"
KNPT503F	50	25.4	44.5	75	57	1/8"
KNPT506F	50	25.4	44.5	75	57	1/4"

AF = Across flats.



COMPRESSION FITTING - STAINLESS STEEL

P/N	DN	A	D1	D2	TUBE OD
KF16TA6	16	32	30	6.7	6.4
KF16TA12	16	50	30	13.1	12.7
KF16TA19	16	56	30	19.4	19.1
KF25TA12	25	50	40	13.4	12.7
KF25TA19	25	58	40	19.4	19.1
KF25TA25	25	62	40	25.8	25.4
KF40TA12	40	58	55	13.4	12.7
KF40TA19	40	63.5	55	19.4	19.1
KF40TA25	40	71	55	25.8	25.4
KF40TA28	40	74	55	29	28.6
KF40TA38	40	84	55	38.4	38.1
KF50TA19	50	63.5	75	19.4	19.1
KF50TA25	50	71	75	25.8	25.4
KF50TA28	50	74	75	29	28.6
KF50TA38	50	87	75	38.4	38.1
KF50TA50	50	87	75	51.1	50.8



KF LIQUID FEEDTHROUGH - STAINLESS STEEL

P/N	DN	TUBE TERMINATION	FIG.	D1	L1	L2	L3	L4
LFKF16PP	16	Plain	1	30	45	75	-	-
LFKF40PP	40	Plain	1	55	45	75	-	-
LFKF40SS	40	6mm fitting	1	55	73	103	-	-
LFKF402PP	40	Plain	2	55	75	45	45	75
LFKF402SS	40	6mm fitting	2	55	103	73	73	103

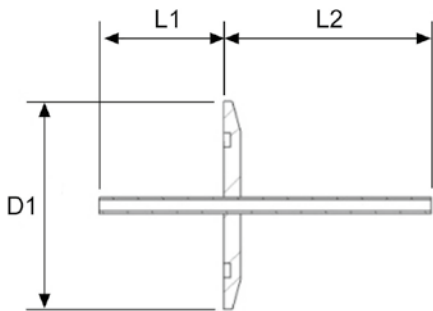


Fig. 1

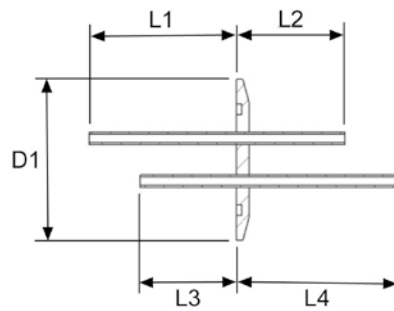


Fig. 2



KF LIQUID NITROGEN FEEDTHROUGH - STAINLESS STEEL

P/N	DN	TUBE TERMINATION	FIG.	D1	L1	L2	L3	L4
LNFKF402PP	40	Plain	1	55	45	75	75	45
LNFKF402SS	40	6mm fitting	1	55	73	103	103	73
LNFKF16PP	16	Plain (6mm - D2)	2	30	45	75	-	-
LNFKF40PPL	40	Plain (6mm - D2)	2	55	45	75	-	-

Other flange and fitting configurations are available on request.

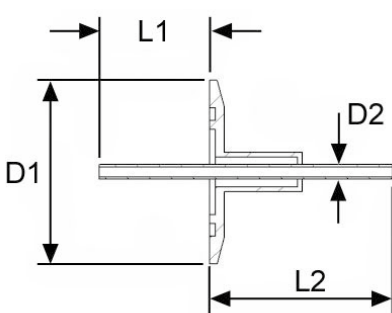


Fig. 1

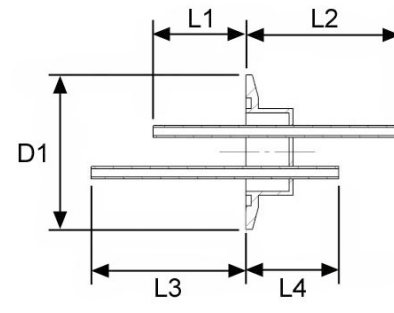


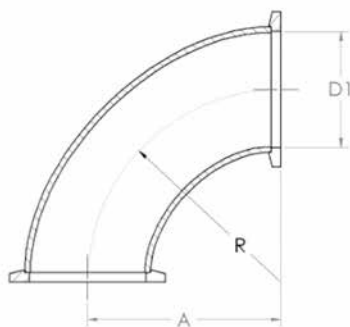
Fig. 2



Elbows, Tees and Crosses

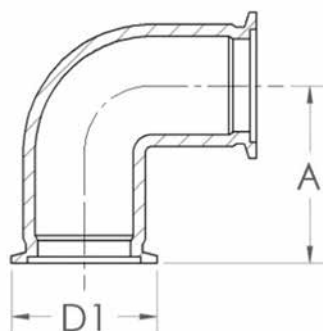
90 DEGREE RADIUS ELBOW - STAINLESS STEEL

P/N	DN	A	D1	R
EL16K	16	40	20.0	27
EL25K	25	50	28.0	37
EL40K	40	65	44.5	60
EL50K	50	70	57.0	65



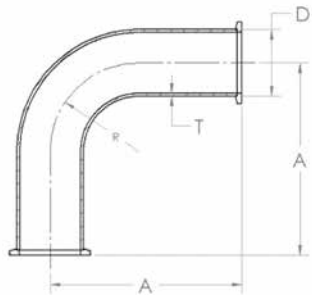
90 DEGREE RADIUS ELBOW - ALUMINUM

P/N	DN	A	D1
EL16KA	16	40	30
EL25KA	25	50	40
EL40KA	40	65	55



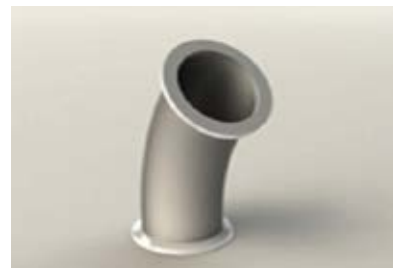
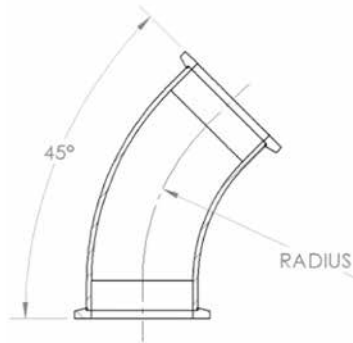
LONG RADIUS ELBOW - STAINLESS STEEL

P/N	DN	A	D1	R	T
LREL40K	40	130	44.5	60	2
LREL50K	50	140	57.0	126	3



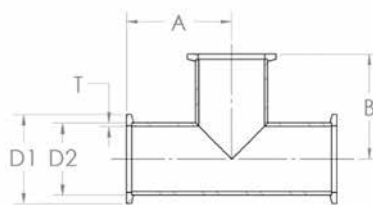
45 DEGREE RADIUS ELBOW - STAINLESS STEEL

P/N	DN	R
EL416KF	16	40
EL425KF	25	45
EL440KF	40	51
EL450KF	50	75



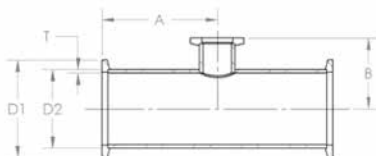
TEE - STAINLESS STEEL

P/N	DN	A	B	D1	D2	T
TE16K	16	40	40	30	20.0	2
TE25K	25	50	50	40	28.0	2
TE40K	40	65	65	55	44.5	2
TE50K	50	70	70	75	57.0	3



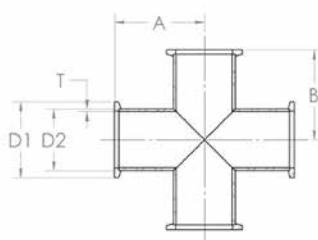
UNEQUAL TEE - STAINLESS STEEL

P/N	DN	A	B	D1	D2	T
UTE2516K	25/16	50	40	40	28.0	2
UTE4016K	40/16	65	40	55	44.5	2
UTE4025K	40/25	65	50	55	44.5	2
UTE5016K	50/16	70	50	75	57.0	3
UTE5025K	50/25	70	65	75	57.0	3
UTE5040K	50/40	70	65	75	57.0	3



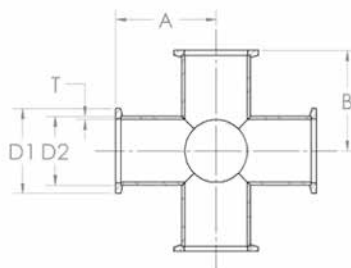
4-WAY CROSS - STAINLESS STEEL

P/N	DN	A	B	D1	D2	T
X16K	16	40	40	30	20.0	2
X25K	25	50	50	40	28.0	2
X40K	40	65	65	55	44.5	2
X50K	50	70	70	75	57.0	3



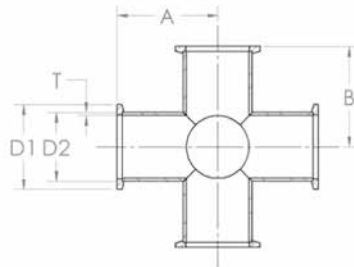
5-WAY CROSS - STAINLESS STEEL

P/N	DN	A	B	D1	D2	T
FWX16K	16	40	40	30	20.0	2
FWX25K	25	50	50	40	28.0	2
FWX40K	40	65	65	55	44.5	2
FWX50K	50	70	70	75	57.0	3



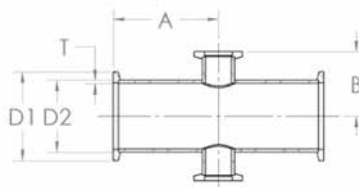
6-WAY CROSS - STAINLESS STEEL

P/N	DN	A	B	D1	D2	T
XX16K	16	40	40	30	20.0	2
XX25K	25	50	50	40	28.0	2
XX40K	40	65	65	55	44.5	2
XX50K	50	70	70	75	57.0	3



4-WAY REDUCING CROSS FIXED - STAINLESS STEEL

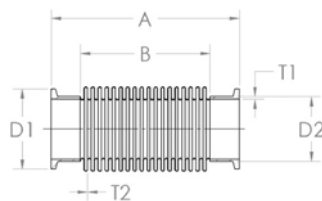
P/N	DN	A	B	D1	D2	T
X25K16	25/16	50	40	40	28.0	2
X40K16	40/16	65	40	55	44.5	2
X40K25	40/25	65	50	55	44.5	2
X50K16	50/16	70	50	75	57.0	3
X50K25	50/25	70	50	75	57.0	3
X50K40	50/40	70	65	75	57.0	3



Bellows and Hoses

FLEXIBLE BELLOWS

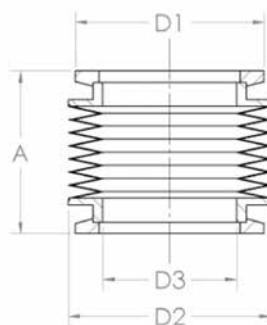
P/N	DN	A	B	D1	D2	T1	T2
KF16FXB	16	121	88.0	30	20.0	2.0	0.10
KF25FXB	25	121	85.7	40	27.0	1.5	0.15
KF40FXB	40	121	83.0	55	44.5	1.6	0.20
KF50FXB	50	110	76.0	75	57.0	3.0	0.25



Material: Stainless Steel.

EDGE WELDED BELLOWS

P/N	DN	A	D1	D2	D3
KF16EWB	16	55	30	31.5	16.0
KF25EWB	25	55	40	46.0	24.0
KF40EWB	40	55	55	59.0	40.4
KF50EWB	50	55	75	76.0	51.0

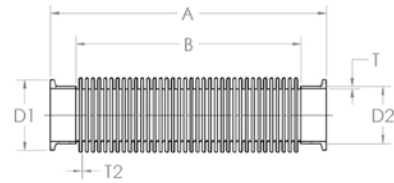


Material: Stainless Steel.

➔ See Section K - Bellows & Movement Feedthroughs / Welded Bellows in this catalogue about special welded bellows.

FLEXIBLE ANNEALED HOSE

P/N	DN	A	B	D1	D2	T	T2
FX16K25	16	250	220	30	20.0	2.0	0.23
FX16K50	16	500	470	30	20.0	2.0	0.23
FX16K75	16	750	720	30	20.0	2.0	0.23
FX16K100	16	1000	970	30	20.0	2.0	0.23
FX25K25	25	250	220	40	27.0	1.5	0.23
FX25K50	25	500	470	40	27.0	1.5	0.23
FX25K75	25	750	720	40	27.0	1.5	0.23
FX25K100	25	1000	970	40	27.0	1.5	0.23
FX40K25	40	250	220	55	44.5	1.6	0.23
FX40K50	40	500	470	55	44.5	1.6	0.23
FX40K75	40	750	720	55	44.5	1.6	0.23
FX40K100	40	1000	970	55	44.5	1.6	0.23
FX50K25	50	250	220	75	57.0	3.0	0.23
FX50K50	50	500	470	75	57.0	3.0	0.23
FX50K75	50	750	720	75	57.0	3.0	0.23
FX50K100	50	1000	970	75	57.0	3.0	0.23

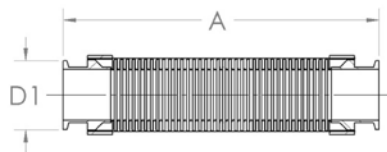


Material: Stainless Steel.

Custom lengths are available on request, standard hoses are annealed, un-annealed can be supplied if required.

BRAIDED FLEXIBLE HOSE - 5 BARS

P/N	DN	A	A
BFX25K13	25	135	40
BFX25K25	25	250	40
BFX25K50	25	500	40
BFX25K100	25	1000	40
BFX40K13	40	135	55
BFX40K25	40	250	55
BFX40K50	40	500	55
BFX40K100	40	1000	55
BFX50K13	50	135	75
BFX50K25	50	250	75
BFX50K50	50	500	75
BFX50K100	50	1000	75

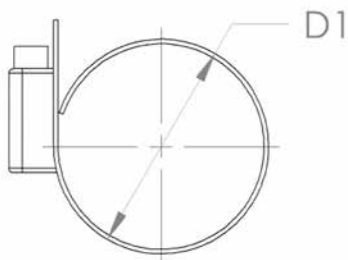


Material: Stainless Steel.

HOSE CLAMPS

P/N	DN	D1
KF16HC	10/16	25
KF25HC	25	36
KF40HC	40	50
KF50HC	50	60

Material: Stainless Steel.



WIRE REINFORCED HOSE - PVC

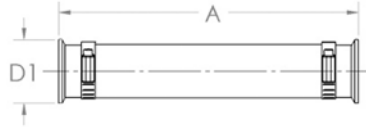
P/N	DN	A	D1 NOMINAL BORE
PVC16	16	1000	19.05
PVC25	25	1000	25.40
PVC40	40	1000	38.10
PVC50	50	1000	50.80

Length on request.



HOSE CONNECTORS - PVC / STAINLESS STEEL

P/N	DN	A	D1
KF16PVC25	16	250	30
KF16PVC50	16	500	30
KF16PVC75	16	750	30
KF16PVC100	16	1000	30
KF25PVC25	25	250	40
KF25PVC50	25	500	40
KF25PVC75	25	750	40
KF25PVC100	25	1000	40
KF40PVC25	40	250	55
KF40PVC50	40	500	55
KF40PVC75	40	750	55
KF40PVC100	40	1000	55
KF50PVC25	50	250	75
KF50PVC50	50	500	75
KF50PVC75	50	750	75
KF50PVC100	50	1000	75



D

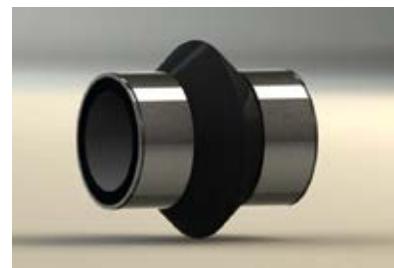
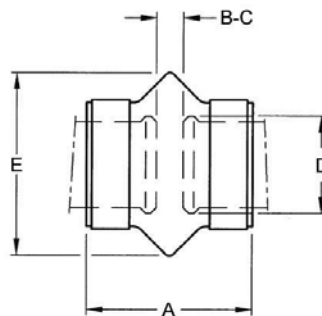
SLEEVE WITH HOSE CLAMP

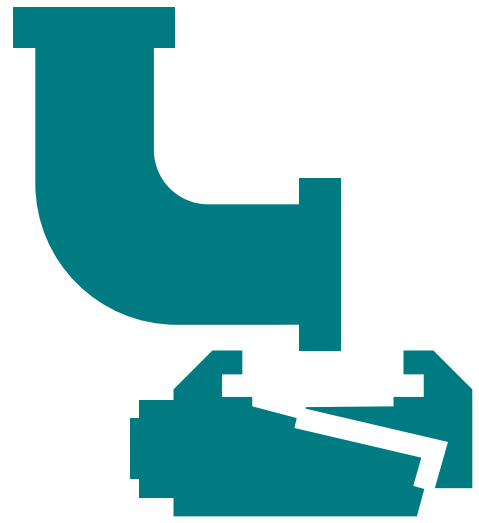
P/N	DN	A	B	C	D	E
KF16SHC	16	58	7	14	16	44
KF25SHC	25	60	9	16	25	50
KF40SHC	40	64	13	20	40	68

Hose clamp: Stainless Steel 430.

Sleeve: Elastomer.

Max. internal pressure: 1 bar.





VACUUM ISO COMPONENTS

- Clamps and SealsE 03
- Flanges and ConnectorsE 07
- Adaptors..... E 11
- Elbows, Tees and Crosses E 13
- Bellows and Hoses E 17

There are four different configurations to fit together ISO flanges.

Figure 1 illustrates the double claw-clamp assembly which is the most commonly used configuration.

Figure 2 shows the wall clamp assembly where a claw-clamp flange is mounted to a rotatable bolt ring. This assembly combines the claw-clamp flange and bolt flanges with nuts and bolts. The rotatable bolt ring and fixed bolted assembly is shown in figure 3. The rotatable bolt ring consists of a rotatable outer ring and a split retainer ring to hold the claw-clamp in place. Finally configuration 4 shows a bolted fixed flange and a tapped flange, or chamber wall for example.

All four configurations use an O-ring seal held in place by a centering ring. This is effective down to 10^{-7} mbar. With Viton O-ring assemblies bakeable to 200°C (sustained 150°C).

The ISO range of flanges and fittings are manufactured from high quality 316L (1.4404) Stainless Steel*.

All given dimensions are nominal in mm.

*304L (1.4306) available on request.



Figure 1



Figure 2



Figure 3

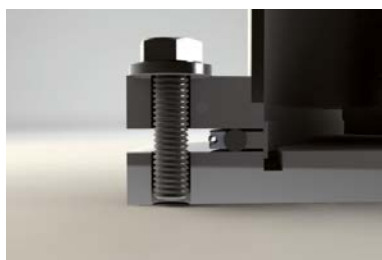
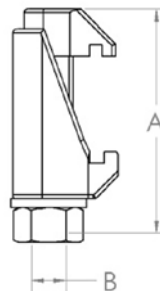


Figure 4

Clamps and Seals

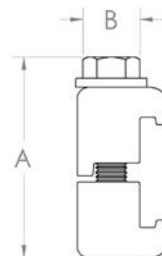
ISO DOUBLE CLAW CLAMPS - STEEL PLATED

P/N	DN	A	B	CLAMPS REQ'D
ISO63/250DC	63-250	60	M10	4
ISO320/500DC	320-500	75	M12	8
ISO630DC	630	85	M12	12



ISO DOUBLE CLAW CLAMPS - ALUMINUM

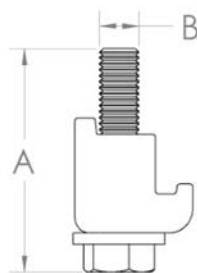
P/N	DN	A	B	CLAMPS REQ'D
ISO63/100DCA	63-100	50	M8	4
ISO160/250DCA	160-250	52	M10	8
ISO320/500DCA	320-500	68	M12	12



ISO WALL CLAMPS - STEEL

P/N	DN	A	B THREAD SIZE	CLAMPS REQ'D
ISO63/100WC	63-100	35	M8	4
ISO160/250WC	160-250	40	M10	8
ISO320/500WC	320-500	50	M12	12

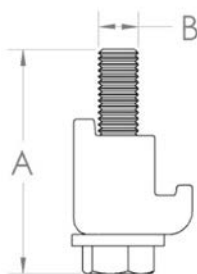
Used with blind tapped holes and centering ring.



ISO WALL CLAMPS - ALUMINUM

P/N	DN	A	B THREAD SIZE	CLAMPS REQ'D
ISO63/100WCA	63-100	35	M8	4
ISO160/250WCA	160-250	40	M10	8
ISO320/500WCA	320-500	50	M12	12

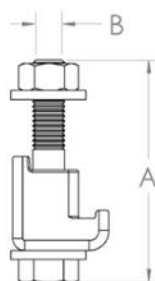
Used with blind tapped holes and centering ring.



ISO WALL CLAMPS, NUT & WASHER - STEEL

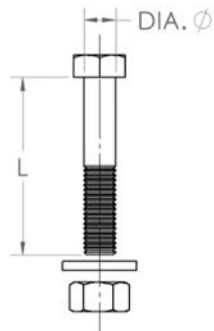
P/N	DN	A	B THREAD SIZE	CLAMPS REQ'D
ISO63/100WCN	63-100	45	M8	4
ISO160/250WCN	160-250	50	M10	8
ISO320/500WCN	320-500	60	M12	12

Used with through bolt holes and centering ring.
Also available with aluminum clamps on request.



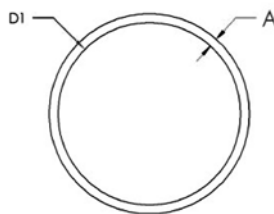
NUT BOLT WASHER SET FOR ISO F FLANGE - STAINLESS STEEL

P/N	DN	DIA	L	SET OF
NBW840	63-100	M8	40	8 PCS
NBW1050	160-250	M10	50	12 PCS
NBW1270	320-500	M12	70	16 PCS
NBW1280	630	M12	80	20 PCS



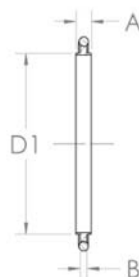
ISO O-RING - VITON / NITRILE

P/N	DN	A	D1	P/N NITRILE
ISO63VR	63	5.3	76	ISO63NR
ISO80VR	80	5.3	88	ISO80NR
ISO100VR	100	5.3	107	ISO100NR
ISO160VR	160	5.3	158	ISO160NR
ISO200VR	200	5.3	221	ISO200NR
ISO250VR	250	5.3	253	ISO250NR
ISO320VR	320	7.0	330	ISO320NR
ISO400VR	400	7.0	405	ISO400NR
ISO500VR	500	7.0	507	ISO500NR
ISO630VR	630	7.0	659	ISO630NR



ISO CENTERING RING

P/N	DN	A	B	D1	O-RING SIZE
ISO63--CR	63	8	3.9	70	5.3
ISO80--CR	80	8	3.9	83	5.3
ISO100--CR	100	8	3.9	102	5.3
ISO160--CR	160	8	3.9	153	5.3
ISO200--CR	200	8	3.9	213	5.3
ISO250--CR	250	8	3.9	261	5.3
ISO320--CR	320	14	5.6	318	7.0
ISO400--CR	400	14	5.6	400	7.0
ISO500--CR	500	14	5.6	501	7.0
ISO630--CR	630	14	5.6	651	7.0



P/N	Materials	Temperature range
SVCR	Stainless Steel 304L / Viton	-10° to 200°C (Sustained 150°C)
SNCR	Stainless Steel 304L / Nitrile	-10 to 100°C

ISO TRAPPED CENTERING RING

P/N	DN	A	B	D1	D2	O-RING SIZE
ISO63--CRT	63	8	3.9	70	94	5.3
ISO80--CRT	80	8	3.9	83	109	5.3
ISO100--CRT	100	8	3.9	102	128	5.3
ISO160--CRT	160	8	3.9	153	179	5.3
ISO200--CRT	200	8	3.9	213	239	5.3
ISO250--CRT	250	8	3.9	261	287	5.3
ISO320--CRT	320	14	5.6	318	358	7.0
ISO400--CRT	400	14	5.6	400	440	7.0
ISO500--CRT	500	14	5.6	501	541	7.0
ISO630--CRT	630	14	5.6	651	691	7.0



P/N	MATERIALS	TEMPERATURE RANGE
SVCRT	Stainless Steel ⁽¹⁾ 304L / Viton	-10 to 200°C (Sustained 150°C)
SNCRT	Stainless Steel ⁽¹⁾ 304L / Nitrile	-10 to 100°C
AVCRT	Aluminum / Viton	-10 to 200°C (Sustained 150°C)
ANCRT	Aluminum / Nitrile	-10 to 100°C

(1) Inner centering ring Stainless Steel, outer Aluminum.

ISO MESH CENTERING RING

P/N	DN	A	B	D1	D2	O-RING SIZE
ISO63MCR-	63	8	3.9	70	86.6	5.3
ISO80MCR-	80	8	3.9	83	98.6	5.3
ISO100MCR-	100	8	3.9	102	117.6	5.3
ISO160MCR-	160	8	3.9	153	168.6	5.3
ISO200MCR-	200	8	3.9	102	231.6	5.3
ISO250MCR-	250	8	3.9	153	263.6	5.3



Stainless Steel centering ring with mesh screen and replacement O-ring.

P/N	MATERIALS	TEMPERATURES
MCRV	Stainless Steel 304L / Viton	-10 to 200°C (Sustained 150°C)
MCRN	Stainless Steel 304L / Nitrile	-10 to 100°C

ISO K SEAL ALUMINUM

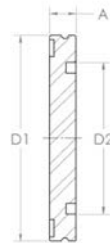
P/N	DN	A	B	C	D	E	NUMBER OF	
							CLAWS	WALL CLAWS
ISO63AS	63	85.6	83	69.8	2.6	4.5	4	
ISO100AS	100	116.6	114	101.8	2.6	4.5	6	8
ISO160AS	160	166.6	164	152.8	2.6	4.5	8	8
ISO250AS	250	276.6	274	260.8	2.6	4.5	12	12



Flanges and Connectors

ISO BLANK CLAW CLAMP FLANGE - STAINLESS STEEL

P/N	DN	A	D1	D2
ISO63BK	63	12	95	70
ISO80BK	80	12	110	83
ISO100BK	100	12	130	102
ISO160BK	160	12	180	153
ISO200BK	200	12	240	213
ISO250BK	250	12	290	261
ISO320BK	320	17	370	318
ISO400BK	400	17	450	400
ISO500BK	500	17	550	501
ISO630BK	630	17	690	651



ISO BORED CLAW CLAMP FLANGE - STAINLESS STEEL

P/N	DN	A	D1	D2	D3
ISO63B76	63	12	95	76	70
ISO80B89	80	12	110	89	83
ISO100B108	100	12	130	108	102
ISO160B159	160	12	180	159	153
ISO200B219	200	12	240	219	213
ISO250B267	250	12	290	267	261
ISO320B324	320	17	370	324	318
ISO400B406	400	17	450	406	400
ISO500B508	500	17	550	508	501
ISO630B660	630	17	690	660	651

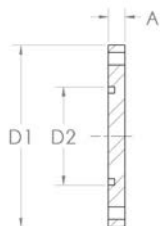


ISO320B324 has a counter bored from vacuum side, D3 = C-ring dimension.

Special bores are available on request.

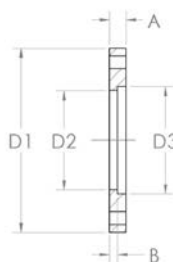
ISO F BLANK FIXED BOLTED FLANGE - STAINLESS STEEL

P/N	DN	A	D1	D2
ISO63FBK	63	12	130	70
ISO80FBK	80	12	145	83
ISO100FBK	100	12	165	102
ISO160FBK	160	12	225	153
ISO200FBK	200	12	285	213
ISO250FBK	250	12	335	261
ISO320FBK	320	17	425	318
ISO400FBK	400	17	510	400



ISO F BORED FIXED BOLTED FLANGE - STAINLESS STEEL

P/N	DN	A	B	D1	D2	D3
ISO63F76	63	12	6	130	70	76
ISO80F89	80	12	6	145	83	89
ISO100F108	100	12	6	165	102	108
ISO160F159	160	12	6	225	153	159
ISO200F219	200	12	6	285	213	219
ISO250F267	250	12	6	335	261	267
ISO320F324	320	17	6	425	318	324
ISO400F406	400	17	10	510	400	406

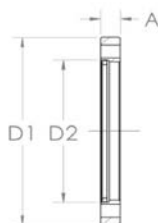


D3 = Tube diameter

Special bores are available on request.

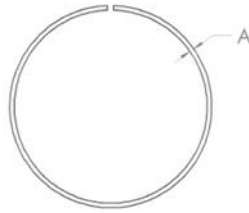
ISO K - ISO F ROTATABLE BOLT RING - STEEL

P/N	DN	A	D1	D2
ISO63R	63	12	130	98.5
ISO100R	100	12	165	133.5
ISO160R	160	16	225	185.7
ISO200R	200	16	285	245.7
ISO250R	250	16	335	295.7



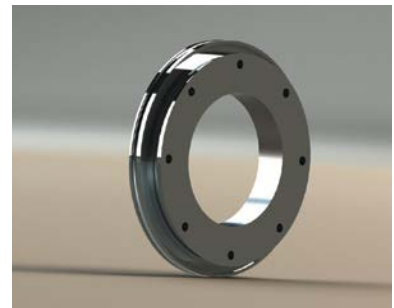
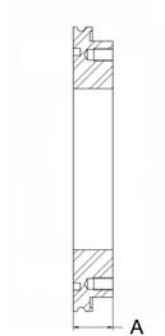
ISO K RETAINING RING - STEEL

P/N	DN	A
ISO63RR	63	3
ISO100RR	100	3
ISO160RR	160	5
ISO200RR	200	5
ISO250RR	250	5
ISO320RR	320	5
ISO400RR	400	8



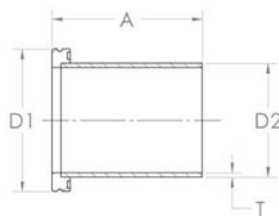
ISO K - ISO F ADAPTER FLANGE - STAINLESS STEEL

P/N	DN ISO K / ISO F	A
ISOK160F63	160/63	22
ISOK160F100	160/100	25
ISOK200F100	200/100	20
ISO200F160	200/160	25
ISO250F160	250/160	22



ISO K TUBULATION - STAINLESS STEEL

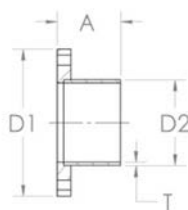
P/N	DN	A	D1	D2	T
ISO63TU	63	100	95	76	3.0
ISO80TU	80	100	110	89	5.5
ISO100TU	100	100	130	108	3.0
ISO160TU	160	100	180	159	3.0
ISO200TU	200	100	240	219	3.0
ISO250TU	250	100	290	267	3.0
ISO320TU	320	100	370	324	3.0
ISO400TU	400	100	450	406	3.0
ISO500TU	500	100	550	508	4.0
ISO630TU	630	100	690	660	5.0



Special lengths are available on request.

ISO F FIXED BOLTED TUBULATION - STAINLESS STEEL

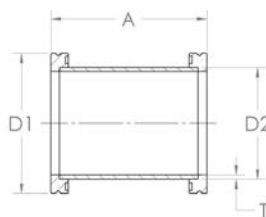
P/N	DN	A	D1	D2	T
ISO63FTU	63	100	130	76	3.0
ISO80FTU	80	100	145	89	5.5
ISO100FTU	100	100	165	108	3.0
ISO160FTU	160	100	225	159	3.0
ISO200FTU	200	100	285	219	3.0
ISO250FTU	250	100	335	267	3.0
ISO320FTU	320	100	425	324	3.0
ISO400FTU	400	100	510	406	3.0
ISO500FTU	500	100	610	508	4.0
ISO630FTU	630	100	750	660	5.0



Special lengths are available on request.

ISO K STRAIGHT CONNECTOR - STAINLESS STEEL

P/N	DN	A	D1	D2	T
ISO63SC	63	100	95	76	3.0
ISO80SC	80	100	110	89	3.0
ISO100SC	100	100	130	108	3.0
ISO160SC	160	100	180	159	3.0
ISO200SC	200	100	240	219	3.0
ISO250SC	250	100	290	267	3.0

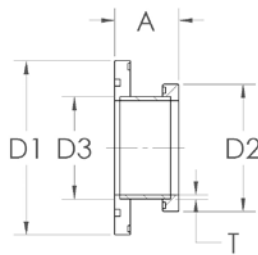


Special lengths are available on request.

Adaptors

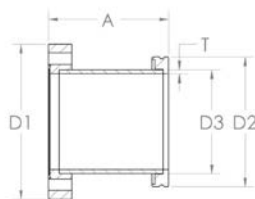
ISO K REDUCING ADAPTOR - STAINLESS STEEL

P/N	DN	A	D1	D2	D3	T
ISO80R63	63/80	50	110	95	76	3.0
ISO100R63	63/100	50	130	95	76	3.0
ISO160R63	63/160	50	180	95	76	3.0
ISO200R63	63/200	90	240	95	76	3.0
ISO100R80	80/100	50	130	110	89	5.5
ISO160R80	80/160	50	180	110	89	5.5
ISO160R100	100/160	50	180	130	108	3.0
ISO200R100	100/200	90	240	130	108	3.0
ISO200R160	160/200	90	240	180	159	3.0
ISO250R160	160/250	90	290	180	159	3.0
ISO250R200	200/250	90	290	240	219	3.0



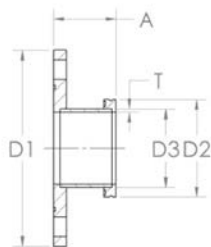
ISO K TO CF ADAPTOR - STAINLESS STEEL

P/N	DN ISO K/CF	A	D1	D2	D3	T
SA6363	63/63	90	114	95	76	3.0
SA1063	63/100	90	152	95	76	3.0
SA1010	100/100	90	152	130	108	3.0
SA1016	160/100	90	152	180	159	3.0
SA1510	100/150	90	203	130	105	3.0
SA1516	160/150	90	203	180	159	3.0



ISO K TO ASA ADAPTOR - STAINLESS STEEL

P/N	DN	A	D1	D2	D3	T
ISA632G	63/ASA2	106	152	95	76	3.0
ISA802G	80/ASA2	106	152	110	89	5.5
ISA1002G	100/ASA2	106	152	130	108	3.0
ISA633G	63/ASA3	106	190	95	76	3.0
ISA803G	80/ASA3	106	190	110	89	5.5
ISA1003G	100/ASA3	106	190	130	108	3.0

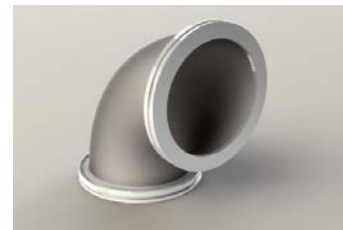
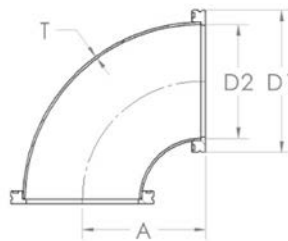


Elbows, Tees and Crosses

ISO K 90 DEGREE ELBOW - STAINLESS STEEL

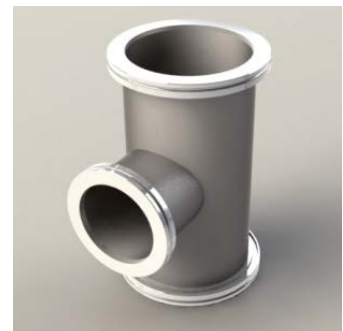
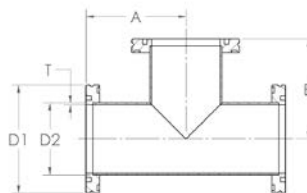
P/N	DN	A	D1	D2	T	ELBOW
ISO63E	63	88	95	70	2	R
ISO80E	80	98	110	70	2	R
ISO100E	100	108	130	108	2	R
ISO160E	160	138	180	159	3	M
ISO200E	200	178	240	219	3	M
ISO250E	250	208	290	267	3	M

R - Radius elbow
M - Mitred elbow



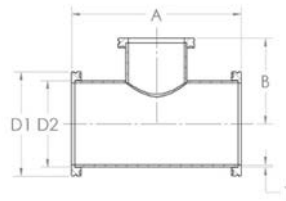
ISO K TEE - STAINLESS STEEL

P/N	DN	A	B	D1	D2	T
ISO63TE	63	88	88	95	76	3.0
ISO80TE	80	98	98	110	89	5.5
ISO100TE	100	108	108	130	108	3.0
ISO160TE	160	138	138	180	159	3.0
ISO200TE	200	178	178	240	219	3.0
ISO250TE	250	208	208	290	267	3.0



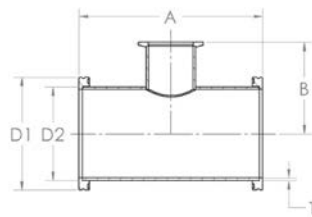
ISO K UNEQUAL TEE - STAINLESS STEEL

P/N	DN	A	B	D1	D2	T
ISO100TE63	100/63	216	107	130	108	3.0
ISO160TE63	160/63	276	130	180	159	3.0
ISO160TE100	160/100	276	131	180	159	3.0
ISO200TE63	200/63	276	160	240	219	3.0
ISO200TE100	200/100	276	161	240	219	3.0
ISO200TE160	200/160	276	168	240	219	3.0



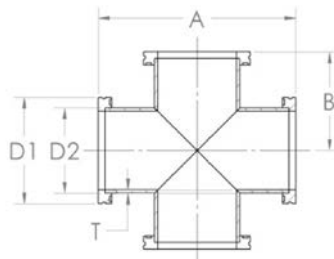
ISO K/KF UNEQUAL TEE - STAINLESS STEEL

P/N	DN ISO K/KF	A	B	D1	D2	T
ISO63TE16	63/16	204	58	95	76	3.0
ISO63TE25	63/25	204	79	95	76	3.0
ISO63TE40	63/40	204	76	95	76	3.0
ISO100TE25	100/25	260	98	130	108	3.0
ISO100TE40	100/40	260	95	130	108	3.0



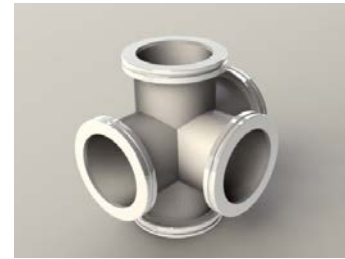
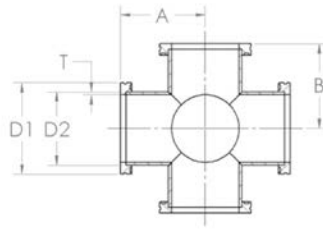
ISO K 4-WAY CROSS - STAINLESS STEEL

P/N	DN	A	B	D1	D2	T
ISO63X	63	176	88	95	76	3.0
ISO80X	80	196	98	110	89	5.5
ISO100X	100	216	108	130	108	3.0
ISO160X	160	276	138	180	159	3.0
ISO200X	200	356	178	240	219	3.0
ISO250X	250	416	208	290	267	3.0



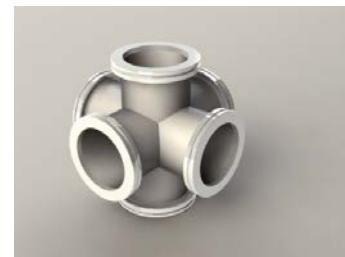
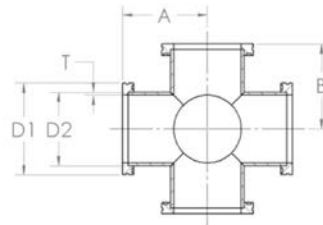
ISO K 5-WAY CROSS - STAINLESS STEEL

P/N	DN	A	B	D1	D2	T
ISO63FWX	63	88	88	95	76	3.0
ISO80FWX	80	98	98	110	89	5.5
ISO100FWX	100	108	108	130	108	3.0
ISO160FWX	160	138	138	180	159	3.0
ISO200FWX	200	178	178	240	219	3.0
ISO250FWX	250	208	208	290	267	3.0



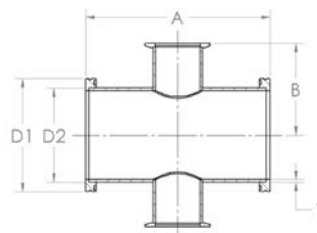
ISO K 6-WAY CROSS - STAINLESS STEEL

P/N	DN	A	B	D1	D2	T
ISO63XX	63	88	88	95	76	3.0
ISO80XX	80	98	98	110	89	5.5
ISO100XX	100	108	108	130	108	3.0
ISO160XX	160	138	138	180	159	3.0
ISO200XX	200	178	178	240	219	3.0
ISO250XX	250	208	208	290	267	3.0



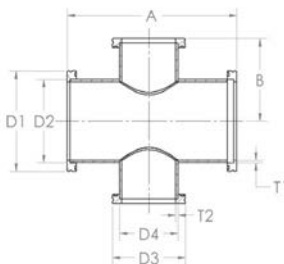
ISO K/KF REDUCING CROSS - STAINLESS STEEL

P/N	DN ISO K/F	A	B	D1	D2	T
ISO63X16	63/16	204	58	95	76	3.0
ISO63X25	63/25	204	79	95	76	3.0
ISO63X40	63/40	204	76	95	76	3.0
ISO63X50	63/50	204	92	95	76	3.0
ISO100X25	100/25	260	98	130	108	3.0
ISO100X40	100/40	260	95	130	108	3.0
ISO100X50	100/50	260	111	130	108	3.0
ISO160X40	160/40	320	121	130	159	3.0
ISO160X50	160/50	320	136	130	159	3.0



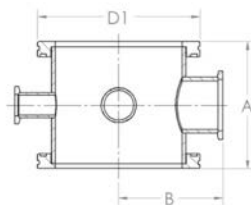
ISO K REDUCING CROSS - STAINLESS STEEL

P/N	DN	A	B	D1	D2	D3	D4	T1	T2
ISO100X63	100/63	216	107	130	108	95	76	3	3
ISO160X63	160/63	276	130	180	159	95	76	3	3
ISO160X100	160/100	276	131	180	159	130	108	3	3
ISO200X160	200/160	256	168	240	219	180	159	3	3



ISO K STRAIGHT CONNECTOR WITH KF LATERAL PORTS - STAINLESS STEEL

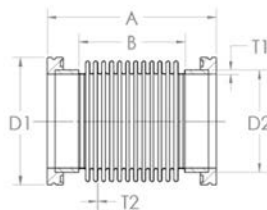
P/N	DN ISO K/KF	A	B (DN16)	D1 (DN40)	D1
ISO63SC4016K	63/40/16	88	60	80	95
ISO100SC4016K	100/40/16	108	75	75	130
ISO160SC4016K	160/40/16	138	100	100	180



Bellows and Hoses

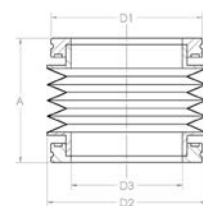
ISO FLEXIBLE BELLOWS - STAINLESS STEEL

P/N	DN	A	B	D1	D2	T1	T2
ISO63FXB	63	127	70	95	76	3.0	0.2
ISO80FXB	80	127	70	110	89	3.0	0.2
ISO100FXB	100	127	60	130	108	3.0	0.4
ISO160FXB	160	220	112	180	159	3.0	0.4
ISO200FXB	200	220	170	240	219	3.0	0.6



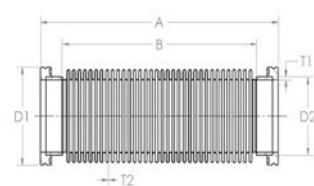
ISO EDGE WELDED BELLOWS - STAINLESS STEEL

P/N	DN	CONVOLUTIONS	STROKE	A	D1	D2	D3	BELLOWS ID
ISO63EWB	63	11	30.8	100	95	100	70	75
ISO100EWB	100	11	33.0	115	130	132	104	102
ISO160EWB	160	13	44.2	140	180	185	153	150



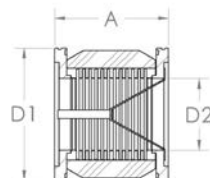
ISO FLEXIBLE HOSE - STAINLESS STEEL

P/N	DN	A	B	D1	D2	T1	T2
ISO63FX25	63	250	172	95	76	3	0.28
ISO63FX50	63	500	422	95	76	3	0.28
ISO63FX75	63	750	672	95	76	3	0.28
ISO63FX100	63	1000	922	95	76	3	0.28
ISO80FX25	80	250	166	110	89	3	0.28
ISO80FX50	80	500	416	110	89	3	0.28
ISO80FX75	80	750	666	110	89	3	0.28
ISO80FX100	80	1000	916	110	89	3	0.28
ISO100FX25	100	250	181	130	108	3	0.28
ISO100FX50	100	500	431	130	108	3	0.28
ISO100FX75	100	750	681	130	108	3	0.28
ISO100FX100	100	1000	931	130	108	3	0.28
ISO160FX25	160	250	170	180	159	3	0.38
ISO160FX50	160	500	420	180	159	3	0.38
ISO160FX75	160	750	670	180	159	3	0.38
ISO160FX100	160	1000	920	180	159	3	0.38



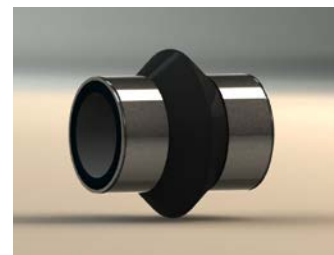
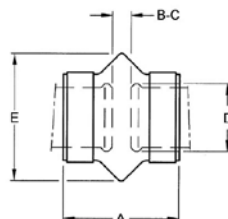
ISO VIBRATION ISOLATOR - STAINLESS STEEL

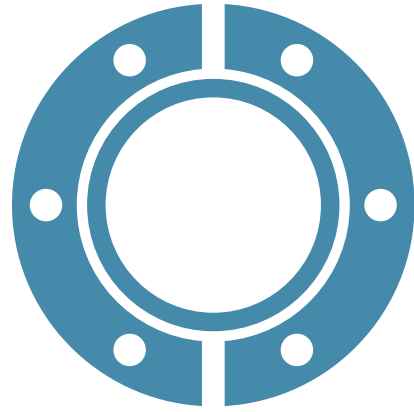
P/N	DN	A	D1	D2
ISO63VBD	63	85	95	52
ISO100VBD	100	85	130	76
ISO160VBD	160	85	180	95



SLEEVE WITH HOSE CLAMP

P/N	DN	A	B	C	D	E
ISO63SHC	63	70	14	24	75	120
ISO100SHC	100	72	8	26	106	150
ISO160SHC	160	72	8	26	155	200





VACUUM CF COMPONENTS

- Seals, Nuts and Bolts Sets.....F 03
- Flanges and ConnectorsF 08
- Adaptors..... F 13
- Elbows, Tees and Crosses F 19
- Bellows and Hoses..... F 27

The CF series flanges use the well proven captured copper gasket sealing principle which is now almost universally used in the UHV industry. The seal - an OFHC* copper gasket - is held between the knife edges of a pair of CF flanges. On tightening the retaining bolts, the knife edges cut into the gasket and force the copper both axially as well as radially outwards to the flange. The material is thus enclosed and cannot flow, even at high bakeout temperatures. This sealing method has a maximum bakeout temperature of 450°C and is suitable for vacuum applications to 10^{-12} mbar.

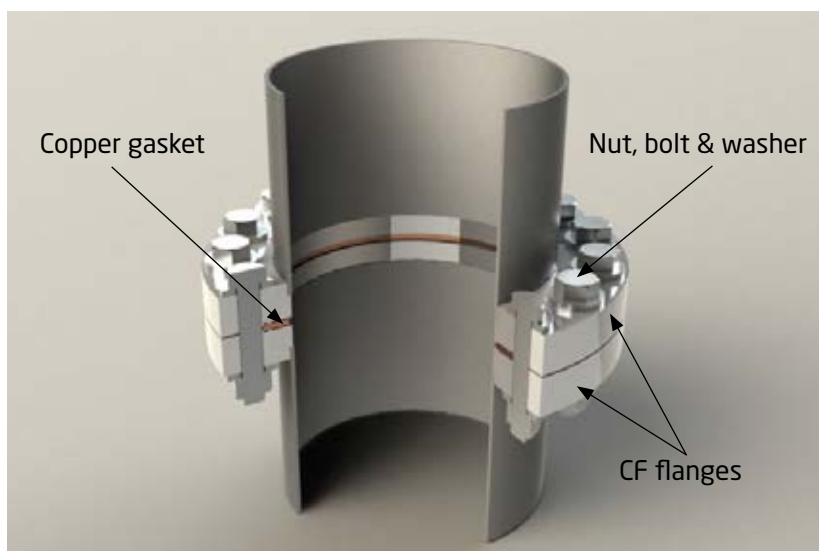
All CF flanges are manufactured from specially selected, high quality Stainless Steel - 304L** (1.4306) or the higher specification 316LN (1.4429). These materials being the accepted standards throughout the UHV vacuum industry. Both Stainless Steels are low carbon varieties designed to avoid inter-granular corrosion after welding. 316LN has the additional advantages of a lower magnetic permeability, harder knife edge, and high temperature H₂ degassing at up to 950°C. Full traceability is available on all materials used.

Protective mouldings and suitable packing ensures that the flanges reach the customer in perfect condition for use on UHV equipment. The product range includes blank, bored and rotatable flanges in all of the internationally approved sizes. Other sizes and special flanges are available to order.

All given dimensions are nominal in mm.

*OFHC: Oxygen-free high conductivity.

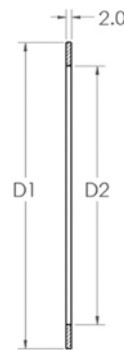
**316L (1.4404) available on request.



Seals, Nuts and Bolts Sets

CF COPPER GASKETS - OFHC COPPER

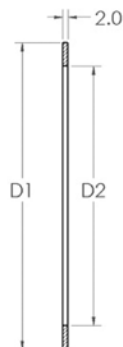
P/N	DN	FOR FLANGE OD	D1	D2	PACK SIZE
CU16	16	34	21	16	10
CU25	25	54	33	25	10
CU35	40	70	48	37	10
CU39	40	70	48	39	10
CU50	50	86	61	51	10
CU63	63	114	82	63	10
CU100	100	152	120	101	10
CU150	150	203	171	152	5
CU200	200	254	222	203	5
CU250	250	304	270	254	5
CU272	250	304	272	254	5



Oxygen free high conductivity (OFHC) copper is a suitable sealing material for bakeable UHV systems because of its good conformity with the thermal expansion coefficient of Stainless Steel as well as its essentially lower hardness (approx. 85 Brinell).

CF ANNEALED COPPER GASKETS - OFHC COPPER

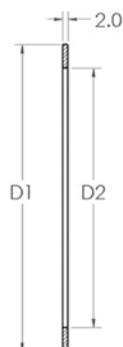
P/N	DN	FOR FLANGE OD	D1	D2	PACK SIZE
CUA16	16	34	21	16	5
CUA35	40	70	48	37	5
CUA63	63	114	82	63	5
CUA100	100	152	120	101	5
CUA150	150	203	171	152	5
CUA200	200	254	222	203	5
CUA250	250	304	270	254	5
CUA272	250	304	272	254	5



The annealed gaskets are recommended for use on viewports, feedthroughs and ionisation gauge heads with glass to metal seals (Hardness approx. 45 Brinell).

CF SILVER PLATED COPPER GASKETS - OFHC COPPER

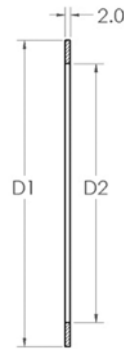
P/N	DN	FOR FLANGE OD	D1	D2	PACK SIZE
CU16SP	16	34	21	16	5
CU25SP	25	54	33	25	10
CU35SP	40	70	48	37	5
CU39SP	40	70	48	39	5
CU50SP	50	86	61	51	10
CU63SP	63	114	82	63	5
CU100SP	100	152	120	101	5
CU150SP	150	203	171	152	5
CU200SP	200	254	222	203	5
CU250SP	250	304	270	254	5
CU272SP	250	304	272	254	5



5 -7 Micron Silver Plating prevents oxidation of the parts exposed to atmosphere during baking.

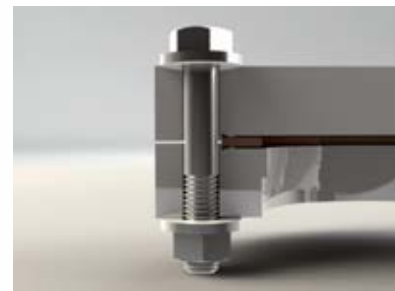
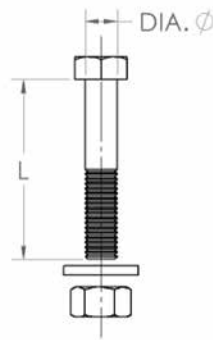
CF SILVER PLATED ANNEALED COPPER GASKETS - OFHC COPPER

P/N	DN	FOR FLANGE OD	D1	D2	PACK SIZE
CUA16SP	16	34	21	16	5
CUA35SP	40	70	48	37	5
CUA63SP	63	114	82	63	5
CUA100SP	100	152	120	101	5
CUA150SP	150	203	171	152	5
CUA200SP	200	254	222	203	5
CUA250SP	250	304	270	254	5
CUA272SP	250	304	272	254	5



CF NUT BOLT WASHER SET FOR CF FLANGE - STAINLESS STEEL

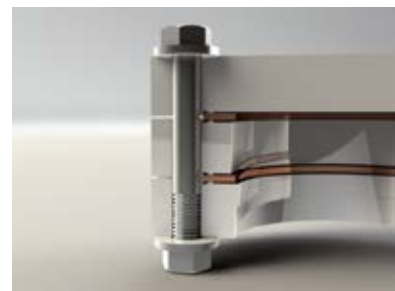
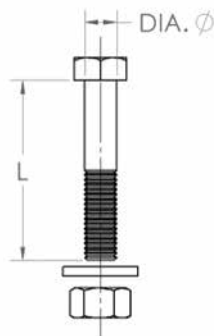
P/N	DN	DIA	L	PACK SIZE
NBW420	16	M4	20	25
NBW635	40	M6	35	25
NBW845	63	M8	45	25
NBW850	100	M8	50	25
NBW860	150	M8	60	25
NBW860	200	M8	60	25
NBW1065	250	M10	65	35



Silver plated bolts are available on request.

CF NUT BOLT WASHER SET FOR DOUBLE SIDED CF FLANGE - STAINLESS STEEL

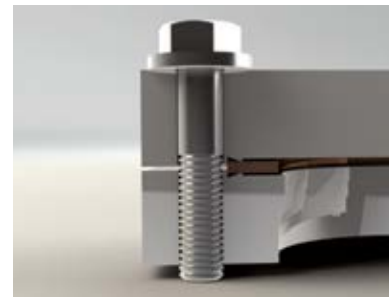
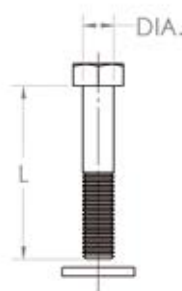
P/N	DN	DIA	L	PACK SIZE
NBW435	16	M4	35	25
NBW650	40	M6	50	25
NBW860	63	M8	60	25
NBW870	100	M8	70	25
NBW880	150	M8	80	25
NBW890	200	M8	90	25
NBW1090	250	M10	90	35



Silver plated bolts are available on request.

CF NUT BOLT WASHER SET FOR TAPPED CF FLANGE - STAINLESS STEEL

P/N	DN	DIA	L	PACK SIZE
BW416	16	M4	16	25
BW625	40	M6	25	25
BW830	63	M8	30	25
BW835	100	M8	35	25
BW835	150	M8	35	25
BW845	200	M8	45	25
BW1050	250	M10	50	35



Silver plated bolts are available on request.

CF BLANK OFF KIT OF PARTS - STAINLESS STEEL

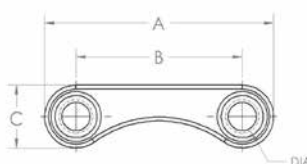
P/N	DN
F16-BLANKOFF	16
F35-BLANKOFF	35
F63-BLANKOFF	63
F100-BLANKOFF	100
F150-BLANKOFF	150
F200-BLANKOFF	200
F250-BLANKOFF	250
F272-BLANKOFF	250

Consist of:
1 x Blank, 1 x Gasket and appropriate quantity of nut, bolts and washers for blanking off ports.



CF PLATE NUT - STAINLESS STEEL

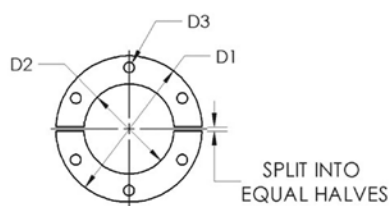
P/N	DN	A	B	C	DIA	QTY
PN16	16	20	13	7	M4	25
PN35	35	41	29	11	M6	25
PN63	63	51	35	12	M8	25
PN100	100	44	25	12	M8	25
PN150	150	44	28	12	M8	25



Used where spanner access to back of flange may be impaired.

CF HORSE SHOE PLATE NUTS - STAINLESS STEEL

P/N	DN	D1	D2	D3
PN16HS	16	34	20	M4
PN35HS	35	70	43	M6
PN63HS	63	114	65	M8
PN100HS	100	152	103	M8
PN150HS	150	203	154	M8



Used to convert a plain flange into a tapped equivalent.

Flanges and Connectors

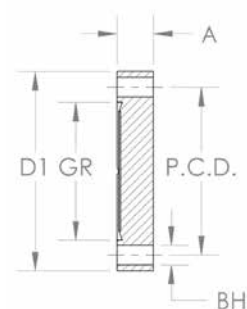
CF FIXED BLANK FLANGE - STAINLESS STEEL

CLEAR BOLT HOLES							
P/N	DN	A	D1	GR	PCD	BH	BOLT HOLES
F16	16	7.6	34	21	27	4.3	6
F35	35	12.7	70	48	58	6.7	6
F63	63	17.4	114	82	92	8.3	8
F100	100	19.9	152	120	130	8.3	16
F150	150	22.3	203	171	181	8.3	20
F200	200	24.6	254	222	231	8.3	24
F250	250	27.3	304	270	283	10.3	32
F272	250	24.6	304	273	284	8.4	32

Available in 316L and 316LN on request.

TAPPED BOLT HOLES	
P/N	THREAD DIA
F16T	M4
F35T	M6
F63T	M8
F100T	M8
F150T	M8
F200T	M8
F250T	M10
F272T	M8

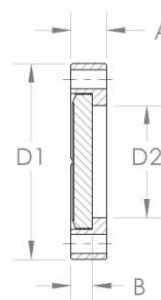
Imperial bolt holes are available on request.



CF ROTABLE BLANK FLANGE - STAINLESS STEEL

CLEAR BOLT HOLES						
P/N	DN	A	B	D1	D2	BOLT HOLES
F16R	16	7.6	5.85	34	19.3	6
F35R	35	12.7	7.05	70	41.4	6
F63R	63	17.4	12.15	114	68.0	8
F100R	100	19.9	13.75	152	104.9	16
F150R	150	22.3	15.25	203	155.7	20
F200R	200	24.6	16.55	254	206.4	24
F250R	250	27.3	19.05	304	259.5	32
F272R	250	24.6	18.00	304	250.7	32

TAPPED BOLT HOLES	
P/N	THREAD DIA
F16RT	M4
F35RT	M6
F63RT	M8
F100RT	M8
F150RT	M8
F200RT	M8
F250RT	M10
F272RT	M8



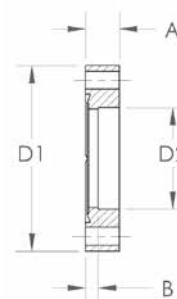
Available in 316L and 316LN on request.

Imperial bolt holes are available on request.

CF FIXED BORED FLANGE - STAINLESS STEEL

CLEAR BOLT HOLES						
P/N	DN	A	B	D1	D2	BOLT HOLES
F16B7	16	7.7	-	34	6.4	6
F16B12	16	7.7	-	34	12.7	6
F16B14	16	7.7	4.8	34	14.4	6
F16B19	16	7.7	4.8	34	19.1	6
F35B14	35	12.7	4.8	70	14.4	6
F35B25	35	12.7	4.8	70	25.5	6
F35B38	35	12.7	4.8	70	38.2	6
F35B41	35	12.7	4.8	70	41.3	6
F63B51	63	17.4	7.9	114	51.2	8
F63B63	63	17.4	7.9	114	63.6	8
F100B	100	19.9	9.5	152	101.9	16
F150B	150	22.2	9.5	203	152.6	20
F200B	200	24.6	9.5	254	203.5	24
F250B	250	27.3	9.5	304	254.4	32
F272B	250	24.6	9.5	304	254.4	32

TAPPED BOLT HOLES	
P/N	THREAD DIA
F16B7T	M4
F16B12T	M4
F16B14T	M4
F16B19T	M4
F35B14T	M6
F35B25T	M6
F35B38T	M6
F35B41T	M6
F63B51T	M8
F63B63T	M8
F100BT	M8
F150BT	M8
F200BT	M8
F250BT	M10
F272BT	M8



Other bore sizes, 316L and 316LN are available on request.

Imperial bolt holes are available on request.

CF ROTATABLE BORED FLANGE - STAINLESS STEEL

CLEAR BOLT HOLES							TAPPED BOLT HOLES	
P/N	DN	A	B	D1	D2	BOLT HOLES	P/N	THREAD DIA
F16R7	16	7.6	-	34	6.4	6	F16R7T	M4
F16R12	16	7.6	-	34	12.7	6	F16R12T	M4
F16R14	16	7.6	4.8	34	14.4	6	F16R14T	M4
F16R19	16	7.6	4.25	34	19.1	6	F16R19T	M4
F35R14	35	12.7	4.8	70	14.4	6	F35R14T	M6
F35R25	35	12.7	4.8	70	25.5	6	F35R25T	M6
F35R38	35	12.7	4.8	70	38.2	6	F35R38T	M6
F35R41	35	12.7	4.8	70	41.3	6	F35R41T	M6
F63R51	63	17.4	7.9	114	51.2	8	F63R51T	M8
F63R63	63	17.4	7.9	114	63.6	8	F63R63T	M8
F100RB	100	19.9	8.95	152	101.9	16	F100RBT	M8
F150RB	150	22.2	8.95	203	152.6	20	F150RBT	M8
F200RB	200	24.6	8.95	254	203.5	24	F200RBT	M8
F250RB	250	27.3	10.1	304	254.4	32	F250RBT	M10
F272RB	250	24.6	11.35	304	254.4	32	F272RBT	M8

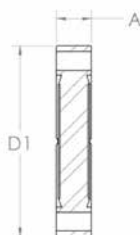


Other bore sizes, 316L and 316LN are available on request.

Imperial bolt holes are available on request.

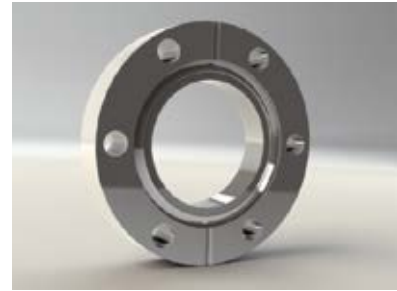
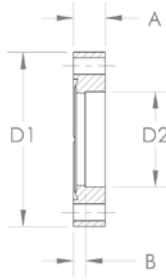
CF DOUBLE SIDED BLANK FLANGE - STAINLESS STEEL

P/N	DN	A	D1
F16DB	16	7.6	34
F35DB	35	12.7	70
F63DB	63	17.4	114
F100DB	100	19.8	152
F150DB	150	22.2	203
F200DB	200	24.6	254



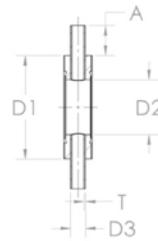
CF DOUBLE SIDED BORED FLANGE - STAINLESS STEEL

P/N	DN	A	D1	D2
F16D14	16	7.6	34	14
F35D38	35	12.7	70	38
F63D63	63	17.4	114	63
F100D100	100	19.8	152	100
F150D150	150	22.2	203	150
F200D200	200	24.6	254	200



CF DOUBLE SIDED BLANK FLANGE WITH RADIAL PORTS - STAINLESS STEEL

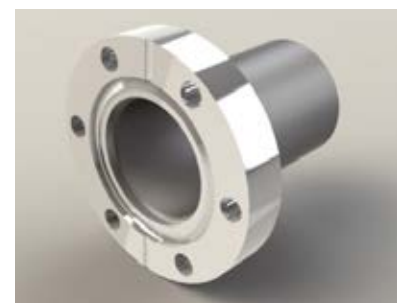
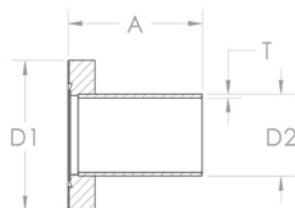
P/N	DN	A	D1	D2	D3	T	No. OF PORTS	PORT TERMINATION
F35DR1	35	20	70	37	10	1	1	Plain tube
F35DR2	35	20	70	37	10	1	2 (180°)	Plain tube
F35DR1KF	35	20	70	37	10	1	1	KF10
F35DR2KF	35	20	70	37	10	1	2 (180°)	KF10
F35DR1CF	35	20	70	37	10	1	1	F16
F35DR2CF	35	20	70	37	10	1	2 (180°)	F16



Baffle plates, accessories and other sizes are available on request.

CF TUBULATION FIXED - STAINLESS STEEL

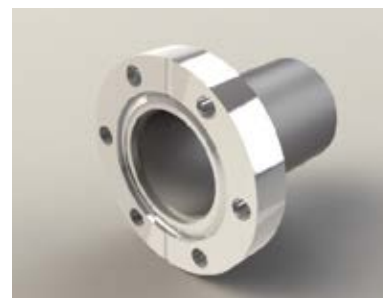
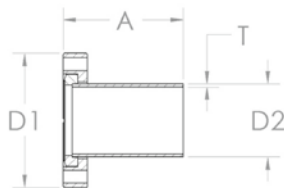
P/N	DN	D1	A	D2	T
TU16	16	34	38	19	1.6
TU35	35	70	63	38	1.6
TU63	63	114	105	64	1.6
TU100	100	152	135	102	1.6
TU150	150	203	167	152	2.0
TU200	200	254	167	203	2.0



Tapped flanges, 316L and 316LN are available on request.

CF TUBULATION ROTATABLE - STAINLESS STEEL

P/N	DN	D1	A	D2	T
TU16R	16	34	38	19	1.6
TU35R	35	70	63	38	1.6
TU63R	63	114	105	64	1.6
TU100R	100	152	135	102	1.6
TU150R	150	203	167	152	2.0
TU200R	200	254	167	203	2.0



Tapped flanges, 316L and 316LN are available on request.

CF STRAIGHT CONNECTOR - FIXED - STAINLESS STEEL

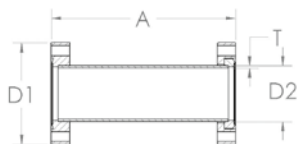
P/N	DN	D1	A	D2	T
SC16	16	76	34	19	1.6
SC35	35	126	70	38	1.6
SC63	63	210	114	64	1.6
SC100	100	270	152	102	1.6
SC150	150	334	203	152	2.0



Bolt holes in-line, straddled are available on request.

CF STRAIGHT CONNECTOR ROTATABLE - 304L STAINLESS STEEL

P/N	DN	A	D1	D2	T
SC16R	16	76	34	19	1.6
SC35R	35	126	70	38	1.6
SC63R	63	210	114	64	1.6
SC100R	100	270	152	102	1.6
SC150R	150	334	203	152	2.0



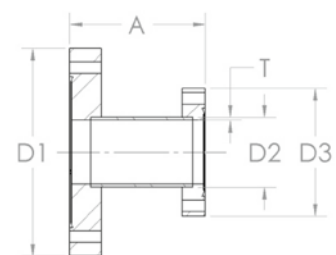
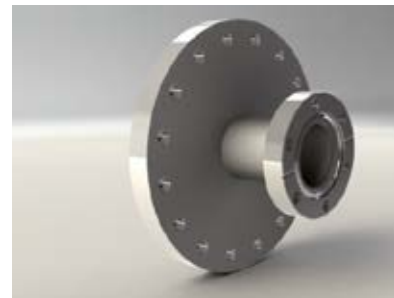
Special lengths and diameters are available on request.

Adaptors

F

CF TUBULATED REDUCER FIXED - STAINLESS STEEL

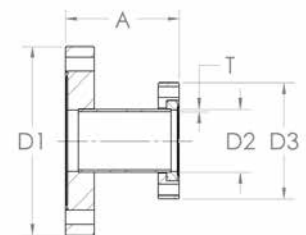
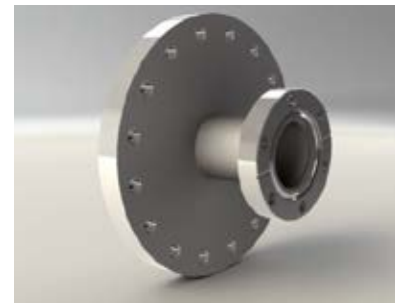
P/N	DN	A	D1	D2	D3	T
TA3516	16/35	70	70	19	34	1.6
TA6316	16/63	70	114	19	34	1.6
TA6335	35/63	70	114	38	70	1.6
TA1035	35/100	70	152	38	70	1.6
TA1063	63/100	70	152	63.5	114	1.6
TA1535	35/150	70	203	38	70	1.6
TA1563	63/150	127	203	63.5	114	1.6
TA1510	100/150	127	203	101.6	152	1.6
TA2063	63/200	127	254	63.5	114	1.6
TA2010	100/200	127	254	101.6	152	1.6
TA2015	150/200	127	254	152.4	203	2.0



Please note that certain flange combinations give you both in-line & straddled bolt holes on a single adaptor.

CF TUBULATED REDUCER ROTATABLE - STAINLESS STEEL

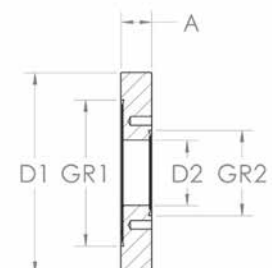
P/N	DN	A	D1	D2	D3	T
TA3516R	16/35	70	70	19	34	1.6
TA6316R	16/63	70	114	19	34	1.6
TA6335R	35/63	70	114	38	70	1.6
TA1035R	35/100	70	152	38	70	1.6
TA1063R	63/100	70	152	63.5	114	1.6
TA1535R	35/150	70	203	38	70	1.6
TA1563R	63/150	127	203	63.5	114	1.6
TA1510R	100/150	127	203	101.6	152	1.6
TA2063R	63/200	127	254	63.5	114	1.6
TA2010R	100/200	127	254	101.6	152	1.6
TA2015R	150/200	127	254	152.4	203	2.0



Special lengths and diameters are available on request.

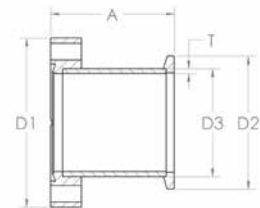
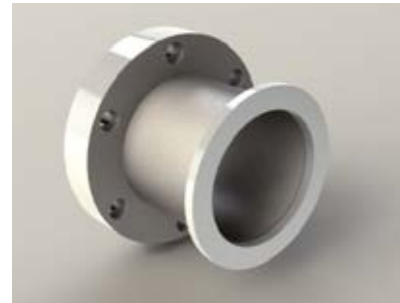
CF ZERO LENGTH REDUCER FLANGE - STAINLESS STEEL

P/N	DN	A	D1	D2	GR1	GR2
ZL3516	16/35	12.7	70	13.2	48	21
ZL6316	16/63	17.4	114	13.2	82	21
ZL6335	35/63	17.4	114	36.9	82	48
ZL1035	35/100	19.9	152	36.9	120	48
ZL1063	63/100	19.9	152	61.2	120	82
ZL1535	35/150	22.2	203	36.9	171	48
ZL1563	63/150	22.2	203	61.2	171	82
ZL1510	100/150	22.2	203	99.4	171	120
ZL2035	35/200	24.6	254	36.9	222	48
ZL2063	63/200	24.6	254	61.2	222	82
ZL2010	100/200	24.6	254	99.4	222	120
ZL2015	150/200	24.6	254	149.7	222	171
ZL2535	35/250	27.3	304	36.9	270	48
ZL2563	63/250	27.3	304	61.2	270	82
ZL2510	100/250	27.3	304	99.4	270	120
ZL2515	150/250	27.3	304	149.7	270	171
ZL2520	200/250	27.3	304	200.4	270	222



CF TO KF ADAPTOR - STAINLESS STEEL

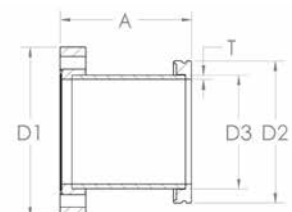
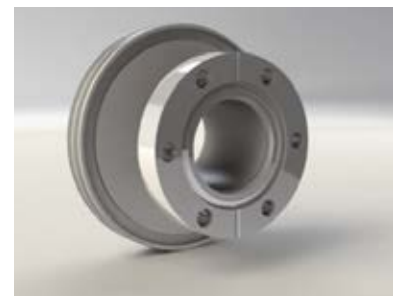
P/N	DN	A	D1	D2	D3	T
KA1616	16/16	36	34	30	20.0	2
KA3516	35/16	36	70	30	20.0	2
KA3525	35/25	36	70	40	28.0	2
KA3540	35/40	50	70	55	44.5	2
KA6325	63/25	50	114	40	28.0	2
KA6340	63/40	50	114	55	44.5	2
KA6350	63/50	50	114	75	57.0	3
KA1025	100/25	50	152	40	28.0	2
KA1040	100/40	50	152	55	44.5	2
KA1050	100/50	50	152	75	57.0	3
KA1525	150/25	70	203	40	28.0	2
KA1540	150/40	70	203	55	44.5	2
KA1550	150/50	70	203	75	57.0	3



Special lengths and diameters are available on request.

CF TO ISO ADAPTOR - STAINLESS STEEL

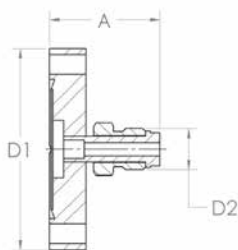
P/N	DN	A	D1	D2	D3	T
SA6363	63/63	90	114	95	63.5	1.6
SA1063	63/100	90	152	95	76.0	3.0
SA1010	100/100	90	152	130	108.0	3.0
SA1016	160/100	90	152	180	101.6	1.6
SA1510	100/150	90	203	130	108.0	3.0
SA1516	160/150	90	203	180	159.0	3.0



Special lengths and diameters are available on request.

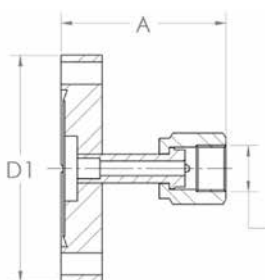
CF MALE VCR ADAPTOR - STAINLESS STEEL

P/N	DN	A	D1	D2
F16VCR6M	16	36	34	1/4"
F16VCR13M	16	41	34	1/2"
F35VCR6M	35	41	70	1/4"
F35VCR13M	35	46	70	1/2"
F35VCR19M	35	53	70	3/4"



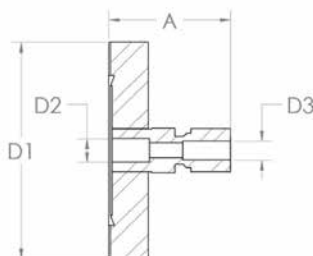
CF FEMALE VCR ADAPTOR - STAINLESS STEEL

P/N	DN	A	D1	D2
F16VCR6F	16	36	34	1/4"
F16VCR13F	16	41	34	1/2"
F35VCR6F	35	41	70	1/4"
F35VCR13F	35	46	70	1/2"
F35VCR19F	35	53	70	3/4"



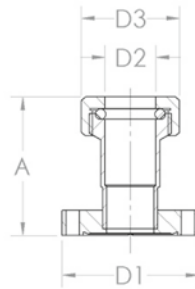
CF TO IMPERIAL PIPE ADAPTOR - STAINLESS STEEL

P/N	DN	A	D1	D2	D3
F16SWA7	16	36	34	4.8	1/4"
F16SWA13	16	41	34	10.4	1/2"
F35SWA7	35	36	70	4.8	1/4"
F35SWA13	35	48	70	10.4	1/2"



CF COMPRESSION FIT TUBING ADAPTOR - STAINLESS STEEL

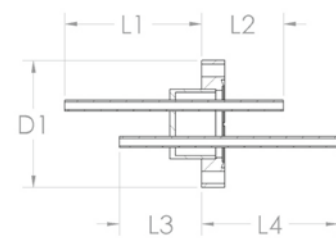
P/N	DN	A	D1	D2	D3
F16TA12	16	50	34	13.1	30
F35TA12	40	50	70	13.1	30
F35TA25	40	62	70	25.8	50
F35TA38	40	84	70	38.4	62
F63TA50	63	87	114	51.5	75



CF LIQUID NITROGEN FEEDTHROUGHS - STAINLESS STEEL

F

P/N	DN	D1	L1	L2	L3	L4	TUBE DIA.	PIPE FITTING
SINGLE FEEDTHROUGH								
LNF16PP	16	34	45	75	-	-	6	PP
LNF16SP	16	34	45	103	-	-	6	SP
LNF16SS	35	34	103	103	-	-	6	SS
LNF35PP	35	70	45	75	-	-	6	PP
LNF35SP	35	70	45	103	-	-	6	SP
LNF35SS	35	70	103	103	-	-	6	SS
2-WAY FEEDTHROUGH. FIGURE 1.								
LNF352PP	35	70	75	45	45	75	6	PP
LNF352SP	35	70	75	73	45	103	6	SP
LNF352SS	35	70	103	73	73	103	6	SS



Pipe fitting, first letter indicates termination on vacuum side, second atmosphere.
P = Plain. S = 6mm or 12mm metric fitting.

Figure 1

CF LIQUID FEEDTHROUGHS - STAINLESS STEEL

P/N	DN	D1	L1	L2	L3	L4	TUBE DIA.	PIPE FITTING
SINGLE FEEDTHROUGH								
LF16PP	16	34	45	75	-	-	6	PP
LF16SP	16	34	45	103	-	-	6	SP
LF16SS	16	34	103	103	-	-	6	SS
LF35PP	35	70	45	75	-	-	6	PP
LF35SP	35	70	45	103	-	-	6	SP
LF35SS	35	70	103	103	-	-	6	SS
DOUBLE FEEDTHROUGH. FIGURE 1.								
LF352PP	35	70	45	75	75	45	6	PP
LF352SP	35	70	45	103	75	73	6	SP
LF352SS	35	70	73	103	103	73	6	SS

Pipe fitting, first letter indicates termination on vacuum side, second atmosphere.
 P = Plain. S = 6mm or 12mm metric fitting.

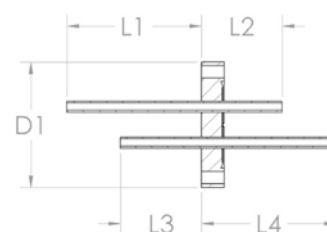
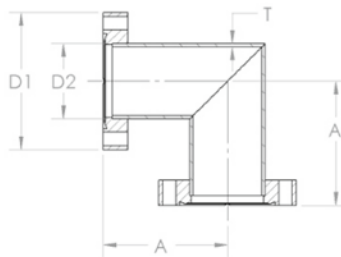


Figure 1

Elbows, Tees and Crosses

CF 90 DEGREE MITRED ELBOW FIXED - STAINLESS STEEL

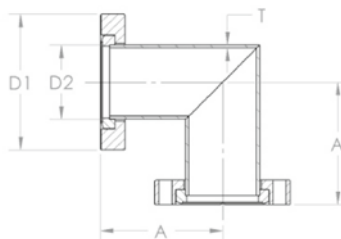
P/N	DN	A	D1	D2	T
EL16	16	38	34	19	1.6
EL35	35	63	70	38	1.6
EL63	63	105	114	64	1.6
EL100	100	135	152	102	1.6
EL150	150	167	203	152	2.0
EL200	200	203	254	203	2.0



Bolt holes in-line, straddled are available on request.

CF 90 DEGREE MITRED ELBOW ROTATABLE - STAINLESS STEEL

P/N	DN	A	D1	D2	T
EL16R	16	38	34	19	1.6
EL35R	35	63	70	38	1.6
EL63R	63	105	114	64	1.6
EL100R	100	135	152	102	1.6
EL150R	150	167	203	152	2.0
EL200R	200	203	254	203	2.0

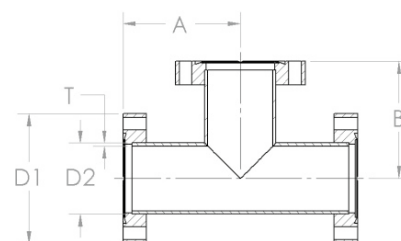


CF TEE FIXED - STAINLESS STEEL

P/N	DN	A	B	D1	D2	T
TE16	16	38	38	34	19	1.6
TE35	35	63	63	70	38	1.6
TE63	63	105	105	114	64	1.6
TE100	100	135	135	152	102	1.6
TE150	150	167	167	203	152	2.0
TE200	200	203	203	254	203	2.0

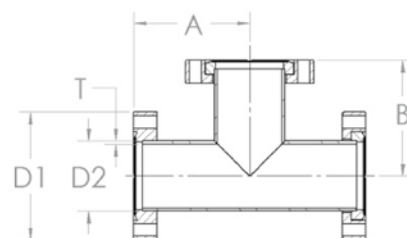


Bolt holes in-line, straddled are available on request.



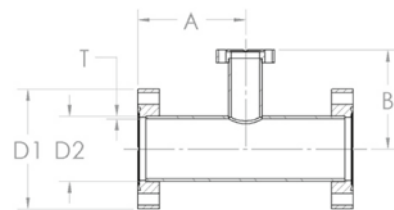
CF TEE ROTATABLE - STAINLESS STEEL

P/N	DN	A	B	D1	D2	T
TE16R	16	38	38	34	19	1.6
TE35R	35	63	63	70	38	1.6
TE63R	63	105	105	114	64	1.6
TE100R	100	135	135	152	102	1.6
TE150R	150	167	167	203	152	2.0
TE200R	200	203	203	254	203	2.0



CF UNEQUAL TEE FIXED - STAINLESS STEEL

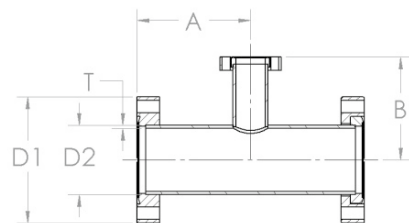
P/N	DN	A	B	D1	D2	T
UTE3516	35/16	63	60	70	38	1.6
UTE6316	63/16	105	77	114	64	1.6
UTE6335	63/35	105	77	114	64	1.6
UTE1016	100/16	135	95	152	102	1.6
UTE1035	100/35	135	95	152	102	1.6
UTE1063	100/63	135	95	152	102	1.6
UTE1516	150/16	167	120	203	152	2.0
UTE1535	150/35	167	120	203	152	2.0
UTE1563	150/63	167	120	203	152	2.0
UTE1510	150/100	167	120	203	152	2.0



Bolt holes in-line, straddled are available on request.

CF UNEQUAL TEE ROTATABLE - STAINLESS STEEL

P/N	DN	A	B	D1	D2	T
UTE3516R	35/16	63	60	70	38	1.6
UTE6316R	63/16	105	77	114	64	1.6
UTE6335R	63/35	105	77	114	64	1.6
UTE1016R	100/16	135	95	152	102	1.6
UTE1035R	100/35	135	95	152	102	1.6
UTE1063R	100/63	135	95	152	102	1.6
UTE1516R	150/16	167	120	203	152	2.0
UTE1535R	150/35	167	120	203	152	2.0
UTE1563R	150/63	167	120	203	152	2.0
UTE1510R	150/100	167	120	203	152	2.0

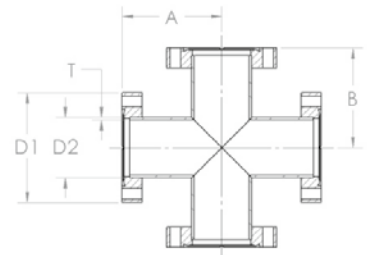


CF 4-WAY CROSS FIXED - STAINLESS STEEL

P/N	DN	A	B	D1	D2	T
X16	16	38	38	34	19	1.6
X35	35	63	63	70	38	1.6
X63	63	105	105	114	64	1.6
X100	100	135	135	152	102	1.6
X150	150	167	167	203	152	2.0
X200	200	203	203	254	203	2.0

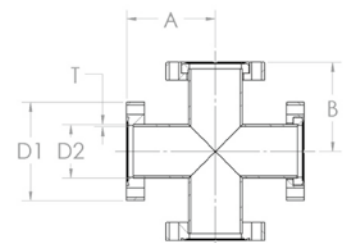


Bolt holes in-line, straddled are available on request.



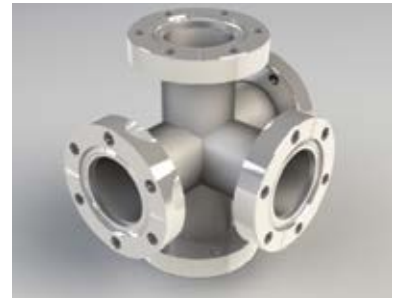
CF 4-WAY CROSS ROTATABLE - STAINLESS STEEL

P/N	DN	A	B	D1	D2	T
X16R	16	38	38	34	19	1.6
X35R	35	63	63	70	38	1.6
X63R	63	105	105	114	64	1.6
X100R	100	135	135	152	102	1.6
X150R	150	167	167	203	152	2.0
X200R	200	203	203	254	203	2.0

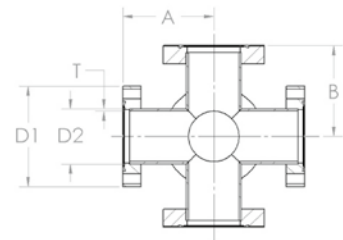


CF 5-WAY CROSS FIXED - STAINLESS STEEL

P/N	DN	A	B	D1	D2	T
FWX16	16	38	38	34	19	1.6
FWX35	35	63	63	70	38	1.6
FWX63	63	105	105	114	64	1.6
FWX100	100	135	135	152	102	1.6
FWX150	150	167	167	203	152	2.0
FWX200	200	203	203	254	203	2.0

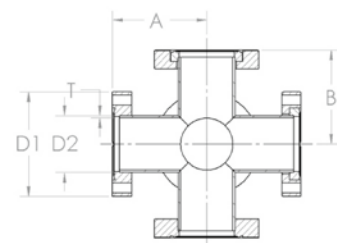


Bolt holes in-line, straddled are available on request.



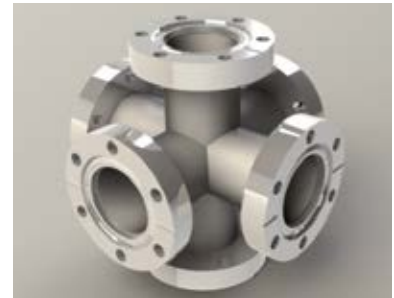
CF 5-WAY CROSS ROTATABLE - STAINLESS STEEL

P/N	DN	A	B	D1	D2	T
FWX16R	16	38	38	34	19	1.6
FWX35R	35	63	63	70	38	1.6
FWX63R	63	105	105	114	64	1.6
FWX100R	100	135	135	152	102	1.6
FWX150R	150	167	167	203	152	2.0
FWX200R	200	203	203	254	203	2.0

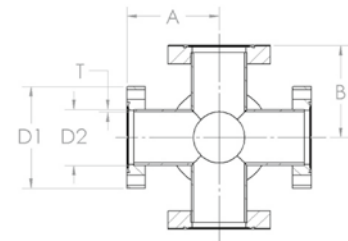


CF 6-WAY CROSS FIXED - STAINLESS STEEL

P/N	DN	A	B	D1	D2	T
XX16	16	38	38	34	19	1.6
XX35	35	63	63	70	38	1.6
XX63	63	105	105	114	64	1.6
XX100	100	135	135	152	102	1.6
XX150	150	167	167	203	152	2.0
XX200	200	203	203	254	203	2.0

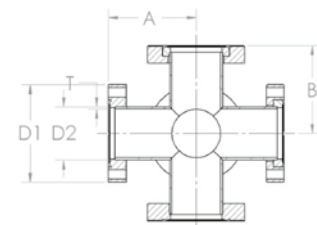
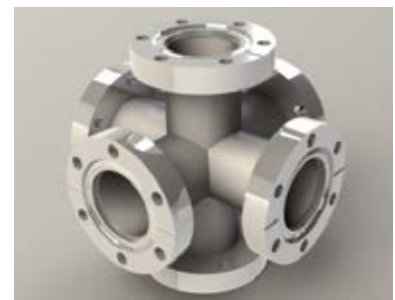


Bolt holes in-line, straddled are available on request.



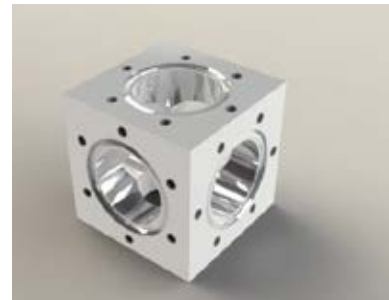
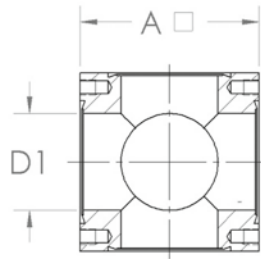
CF 6-WAY CROSS ROTATABLE - STAINLESS STEEL

P/N	DN	A	B	D1	D2	T
XX16R	16	38	38	34	19	1.6
XX35R	35	63	63	70	38	1.6
XX63R	63	105	105	114	64	1.6
XX100R	100	135	135	152	102	1.6
XX150R	150	167	167	203	152	2.0
XX200R	200	203	203	254	203	2.0



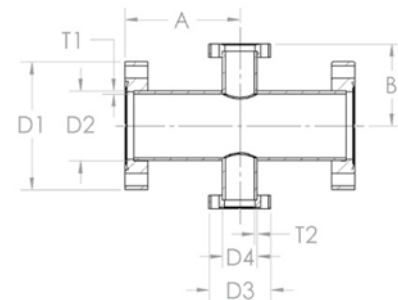
CF CUBE - STAINLESS STEEL

P/N	DN	A	D1
CUBE16	16	34.6	15.8
CUBE35	35	74.0	38.1
CUBE63	63	127.0	64.0
CUBE100	100	160.0	101.6
CUBE150	150	235.0	149.7



CF 4-WAY REDUCING CROSS FIXED - STAINLESS STEEL

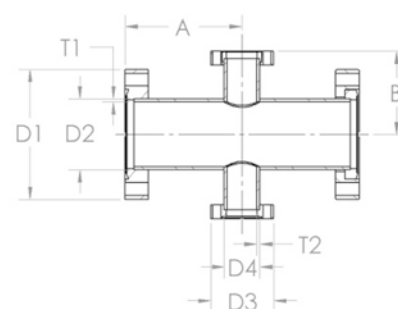
P/N	DN	A	B	D1	D2	T1	D3	D4	T2
UX3516	35/16	63	60	70	38	1.6	34	19	1.6
UX6316	63/16	105	77	114	64	1.6	34	19	1.6
UX6335	63/35	105	77	114	64	1.6	70	38	1.6
UX1016	100/16	135	95	152	102	1.6	34	19	1.6
UX1035	100/35	135	95	152	102	1.6	70	38	1.6
UX1063	100/63	135	95	152	102	1.6	114	64	1.6
UX1535	150/35	167	120	203	152	2.0	70	38	1.6
UX1563	150/63	167	120	203	152	2.0	114	64	1.6
UX1510	150/100	167	120	203	152	2.0	152	102	1.6



Bolt holes in-line, straddled are available on request.

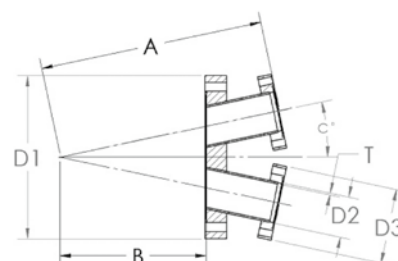
CF 4-WAY REDUCING CROSS ROTATABLE - STAINLESS STEEL

P/N	DN	A	B	D1	D2	T1	D3	D4	T2
UX3516R	35/16	63	60	70	38	1.6	34	19	1.6
UX6316R	63/16	105	77	114	64	1.6	34	19	1.6
UX6335R	63/35	105	77	114	64	1.6	70	38	1.6
UX1016R	100/16	135	95	152	102	1.6	34	19	1.6
UX1035R	100/35	135	95	152	102	1.6	70	38	1.6
UX1063R	100/63	135	95	152	102	1.6	114	64	1.6
UX1535R	150/35	167	120	203	152	2.0	70	38	1.6
UX1563R	150/63	167	120	203	152	2.0	114	64	1.6



CF CLUSTER FLANGE - STAINLESS STEEL

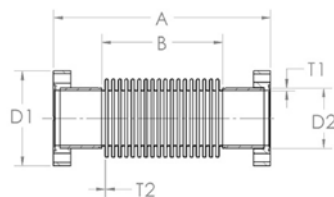
P/N	DN	No. OF PORTS	A	B	C	D1	D2	D3	T
CF3P	35	3	208	135	11.9°	152	38	70	1.6
CF4P	35	4	250	167	13.0°	203	38	70	1.6



Bellows and Hoses

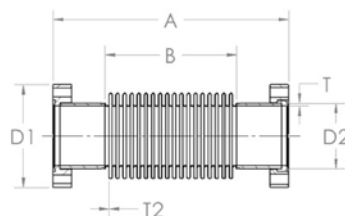
CF FLEXIBLE BELLOWS FIXED - STAINLESS STEEL

P/N	DN	A	B	D1	D2	T1	T2
FXB16	16	110	58	34	18.5	1.75	0.1
FXB35	35	160	91	70	44.5	2.00	0.2
FXB63	63	250	80	114	76.0	3.00	0.2
FXB100	100	250	143	152	108	3.00	0.4



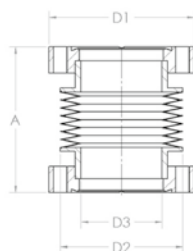
CF FLEXIBLE BELLOWS ROTATABLE - STAINLESS STEEL

P/N	DN	A	B	D1	D2	T1	T2
FXB16R	16	110	58	34	18.5	1.75	0.1
FXB35R	35	160	91	70	44.5	2.00	0.2
FXB63R	63	250	80	114	76.0	3.00	0.2
FXB100R	100	250	143	152	108	3.00	0.4



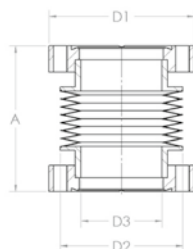
CF EDGE WELDED BELLOWS FIXED - STAINLESS STEEL

P/N	DN	CONVOLUTIONS	STROKE	A	D1	D2	D3
EWB16	16	19	23	108	34	31.5	16.0
EWB35	35	13	26	155	70	59.0	38.0
EWB63	63	13	33	200	114	90.0	60.3
EWB100	100	11	33	219	152	132.0	104.0



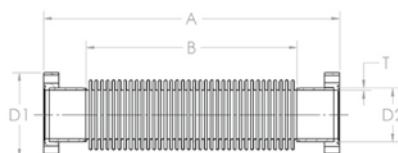
CF EDGE WELDED BELLOWS ROTATABLE - STAINLESS STEEL

P/N	DN	CONVOLUTIONS	STROKE	A	D1	D2	D3
EWB16R	16	19	23	108	34	31.5	16.0
EWB35R	35	13	26	155	70	59.0	38.0
EWB63R	63	13	33	200	114	90.0	60.3
EWB100R	100	11	33	219	152	132.0	104.0



CF FLEXIBLE HOSE - STAINLESS STEEL

P/N	DN	A	B	D1	D2	T1	P/N	DN
FX16CF25	16	250	210	34	16.0	2	FX16CF25R	16
FX16CF50	16	500	460	34	16.0	2	FX16CF50R	16
FX16CF75	16	750	710	34	16.0	2	FX16CF75R	16
FX16CF100	16	1000	960	34	16.0	2	FX16CF100R	16
FX35CF25	35	250	150	70	44.5	2	FX35CF25R	35
FX35CF50	35	500	400	70	44.5	2	FX35CF50R	35
FX35CF75	35	750	650	70	44.5	2	FX35CF75R	35
FX35CF100	35	1000	900	70	44.5	2	FX35CF100R	35
FX63CF25	63	250	126	114	76.0	3	FX63CF25R	63
FX63CF50	63	500	376	114	76.0	3	FX63CF50R	63
FX63CF75	63	750	626	114	76.0	3	FX63CF75R	63
FX63CF100	63	1000	876	114	76.0	3	FX63CF100R	63
FX100CF25	100	250	146	152	108.0	3	FX100CF25R	100
FX100CF50	100	500	396	152	108.0	3	FX100CF50R	100
FX100CF75	100	750	646	152	108.0	3	FX100CF75R	100
FX100CF100	100	1000	896	152	108.0	3	FX100CF100R	100

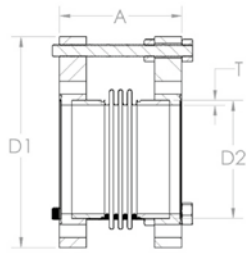


Note: both flanges fixed.

Note: one flange fixed, other rotatable.

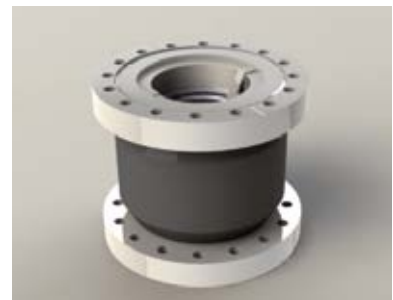
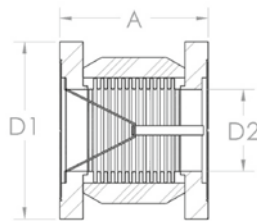
CF PORT ALIGNER - STAINLESS STEEL

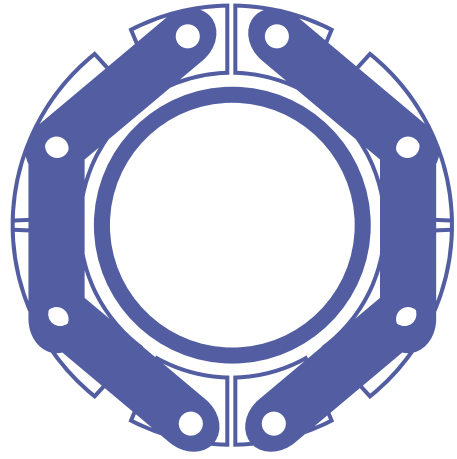
P/N	DN	A	D1	D2	T
PA3535	35	80	70	38	1.6
PA6363	63	80	114	64	1.6
PA1010	100	80	152	102	1.6



CF VIBRATION ISOLATORS - STAINLESS STEEL

P/N	DN	A	D1	D2
F35VBD	35	90	70	24
F63VBD	63	96	114	52
F100VBD	100	99	152	76





VACUUM QUICK-RELEASE VACUUM FITTINGS

G

- KF Chain Clamps, DN 16-63, light..... G 06
- KF Chain Clamps, DN 16-63, standard G 08
- ISO Chain Clamps, DN 80-250, light G 10
- ISO Chain Clamps, DN 80-250, standard G 13
- KF Elastomer Seals, DN 10/16-63, UHV..... G 15
- KF Metal Seals, DN 16-63, UHV..... G 18
- ISO Elastomer Seals, DN 80-250, UHV G 21
- ISO Aluminum Metal Seals
for Tapered Flanges, DN 80-250, UHV..... G 23
- ISO Aluminum Metal Seals
for ISO K Flanges, DN 80-250, UHV G 25
- ISO-Tapered Components, DN 63-250 G 27
- KF Reducers, DN 16-63, UHV..... G 31
- ISO-Tapered Metal Bellows / Metal Hoses,
DN 63-250, UHV G 32
- CeFiX Chain Clamps, DN 16-63, UHV..... G 34
- CeFiX Chain Clamps, DN 80-250, UHV..... G 36
- CeFiX Seals, DN 16-63, DN 80-250, UHV G 37
- CeFiX Components, DN 16-63,
DN 80-250, UHV G 39

CHAIN CLAMPS

These are chains for quick connection of two tubes by means of tapered flanges. The tubes are centered by means of the inserted seals and a tight vacuum is ensured.

Due to the sturdy design, high compression strengths can be achieved and various types of metal seals used. A decisive aspect in many applications, tightening can be done evenly, with just one or two screws. Tightness is guaranteed once a certain tightening torque has been reached. When opening the chains, just one screw needs to be loosened to remove the chain - swift work ensured.

Since suitable materials are used, such connections are usually not any larger - and above all, they are lighter - than fixed flange couplings. There are various standard designs. The entire system is designed for a wide range of diameters and forces so that corresponding combination of standardized parts can cater to many special demands regarding to sealing force, excess pressure and materials.

The main advantages of this system

- High tightening forces
- Even distribution of force
- Simple and swift assembly and removal
- Assembly possible even in places that is difficult to access
- Great flexibility of design
- Versatile use of various seals

Range of applications

These chains are the preferred choice for:

- Vacuum technology and applications demanding the highest sealing tightness (metal seals)
- Locations subject to radiation (nuclear industry, accelerators, etc.) where radiation-proof seals and quick assembly are essential
- Connections that have to withstand high temperatures or baking (UHV connections, furnaces, etc.)
- Chemical industry (corrosion resistant design), petrochemical industry
- Cryogenics
- Generally for connections with medium to large diameters
- Customized designs for critical applications (restricted space, pressure, etc.)
- Securing of units or assemblies with or without sealing but respective center rings (securing of filters, valves, etc.)

The application range is virtually limitless. The maximum diameter depends on requirements and is between 500 and 700 mm.

There are various materials for various purposes, such as antimagnetic systems made from Aluminum and Stainless Steel.

MATERIALS	RANGE OF APPLICATIONS
Plastic high-temperature	-20... +100°C, (150°C short time), antimagnetic, only for elastomer seals, electric insulation, suitable for cleanrooms, for glass and metal flanges
Plastic ultra high-temperature	-20... +200°C, (220°C short time), only for elastomer seals, electric insulation, antimagnetic, suitable for cleanrooms, for glass and metal flanges
Aluminum BX Type* with knob (1 catch)	-271... +150°C, suitable for cleanrooms, antimagnetic, only for elastomer seals
Stainless Steel (1 catch)	-271... +350°C, cryogenics, antimagnetic, radiation resistant, only elastomer seals
Stainless Steel (2 screws)	-271... +350°C, cryogenics, antimagnetic, radiation resistant, metal and elastomer seals
Plastic standard	-20... +60°C, (80°C short time), antimagnetic, only for elastomer seals, electric insulation, suitable for cleanrooms, for glass and metal flanges
Cast Aluminum	-20... +100°C, antimagnetic, only for elastomer seals, suitable for cleanrooms
Forged Aluminum	-271... +150°C, cryogenics, antimagnetic, for metal and elastomer seals, radiation resistant
Nickel plated Steel	-271... +350°C, cryogenics, pressure, radiation resistant, for metal and elastomer seals
Stainless Steel (CeFiX)	-271... +350°C, cryogenics, pressure, antimagnetic, radiation resistant, for elastomer and metal seals

*BX Type (4 contact per link) patented.

SEALS

Neyco provides several types of seals, as following:

- Seals with center rings on the inside or outside made from various elastomer materials
- Seals with center rings on the inside or outside as Aluminum edge seals with various cross-sections
- Moulded seals in various shapes and sizes, Aluminum
- CeFiX seals for UHV applications in Aluminum, Copper or Nickel
- CeFiX seals in various shapes and sizes, Aluminum

MATERIALS	RANGE OF APPLICATIONS
Teflon/Viton	Suitable for cleanrooms, electric insulation, leak rate: $<1.10^{-9}$ mbar.l.s ⁻¹ , antimagnetic, -20... +200°C
Teflon/FEP	Suitable for cleanrooms, electrical insulation, leak rate: $<1.10^{-6}$ mbar.l.s ⁻¹ , antimagnetic, chem./corrosion, -50... +200°C
Aluminum/Viton	Suitable for cleanrooms, pressure, antimagnetic, leak rate: $<1.10^{-9}$ mbar.l.s ⁻¹ , -20... +200°C
Stainless Steel/Viton	Pressure, suitable for cleanrooms, leak rate: $<1.10^{-9}$ mbar.l.s ⁻¹ , antimagnetic, -20... +200°C
Stainless Steel/Kalrez	Excellent chem. /corrosion, suitable for cleanrooms, antimagnetic, leak rate: $<1.10^{-9}$ mbar.l.s ⁻¹ , -10... +315°C
Aluminum	Antimagnetic, radiation resistant, cryogenics, temperature range: -271... +150°C leak rate: $<1.10^{-11}$ mbar.l.s ⁻¹
OFS* Copper/ OFS* Copper Silver plated	Radiation resistant, antimagnetic, pressure, temperature range: -271... +350°C, cryogenics, leak rate: $<1.10^{-11}$ mbar.l.s ⁻¹
Nickel	Antimagnetic, radiation resistant, cryogenics, temperature range: -271... +150°C leak rate: $<1.10^{-11}$ mbar.l.s ⁻¹

*OFS: Oxygen-free, silver-alloyed copper for higher thermal stability.

FLANGES

Flanges can be used with chain clamps and elastomer seals or with metal seals for UHV applications.

Neyco provides several systems: KF, ISO-Tapered™, CeFiX

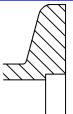


- Temperature: -271°C to +300°C (304), -271°C to +350°C (316L)
- Leak rate: $<1.10^{-9}$ mbar.l.s⁻¹
- Antimagnetic, cryogenics

KF / ISO-Tapered™ Systems (metal)

- Materials: Stainless Steel 304/ Stainless Steel 316L

Advantages

- Space-saving, quick connections
- Exceedingly high vacuum tightness
- Temperature- and radiation-resistant designs
- Antimagnetic designs
- Even distribution of force
- Rotary connection

DRAWING	FLANGE TYPE	FLANGE MATERIAL	SEALS	SEALING SURFACE	CLAMPING MEANS
	KF DN 10 to 63	Aluminum Stainless Steel Glass	Elastomer Aluminum (Copper)	Unprotected	Chain clamps (1 screw)
	ISO-Tapered DN 80 to 250	Aluminum Stainless Steel Glass	Elastomer Aluminum	Unprotected	Chain clamps (1 or 2 screws)
	EVAC-CeFiX DN 80 to 250	Aluminum Stainless Steel	Elastomer Aluminum Copper Nickel	Protected No cutting edge	Chain clamps

CeFiX systems

The most striking feature of the CeFiX flange compared to the CF flange is the lack of a cutting edge. The edge is easily damaged and requires high sealing forces and has therefore been omitted with the CeFiX system.

The seals are designed in such a way that they seal on the 20 degree taper of the flange, thereby reducing the necessary sealing force by up to 50 %. Since the dimensions of the

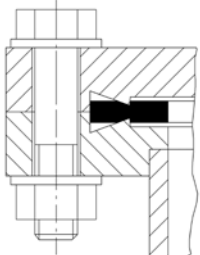
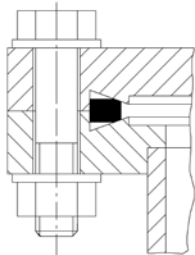
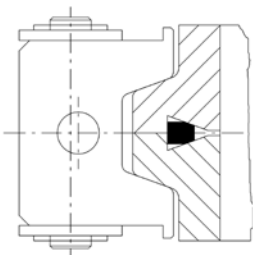
sealing groove of both systems are absolutely identical, the CeFiX seal can also be used for standard CF flanges. So the seal can also be used for flanges with slightly damaged flange edges.

Thanks to the reduced sealing force, Nickel alloys can also be used, but just for CeFiX flanges, since standard CF flanges could be damaged.

Comparison of sealing force (N/mm sealing length)

	CeFiX	STANDARD
Aluminum	70	100
Copper	220	410
Nickel	400	680

- Materials: Stainless Steel 316L
- Temperature: -271°C to +350°C
- Leak rate: <math> < 1.10^{-11} \text{ mbar.l.s}^{-1} </math>
- Antimagnetic, cryogenics, suitable for UHV, excess pressure, resistant to chemicals

STANDARD CF CONNECTION	CeFiX SEAL WITH CF FLANGES	CeFiX SEAL CHAIN CLAMP WITH SPECIFIC FLANGES
Sealing force 100%	Sealing force 50%	Sealing force 50%
		

BELLOWS AND HOSES

Advantages

- Highly flexible, without annealing
- Highest bending and torsion strength
- Can be used for ultra-high vacuum to slight pressure
- Bakeable, suitable for cryogenics
- Radiation resistant, antimagnetic
- Perfect to clean (ultrasound)
- Optimum corrosion resistance
- Minimum outgassing

Behaviour under pressure

Metal bellows and tubes are used for vacuum, excess pressure and on both sides.

If subjected to excess pressure, the bellows and tubes tend to elongate or - in the case of tightly clamped flanges - to buckle.


Applications

- Compensation of axial, lateral or angular set-offs
- Prevention of vibration transfer
- Substitute for elastomer compensators
- Compensate thermal expansion

Metal bellows and hoses

- Materials: Stainless Steel 304 (flanges), Stainless Steel 316Ti (bellows), Stainless Steel 316L (hoses)
- Temperature: -200°C to +350°C
- Leak rate: $<1.10^{-9}$ mbar.l.s⁻¹
- Antimagnetic, cryogenics, radiation resistant, suitable for clean rooms, usable with metal or elastomer seals

Teflon bellows

 See Section H - Glass & Quartz Components in this catalogue.

All given dimensions are nominal in mm.



Chain clamps



Metal bellows

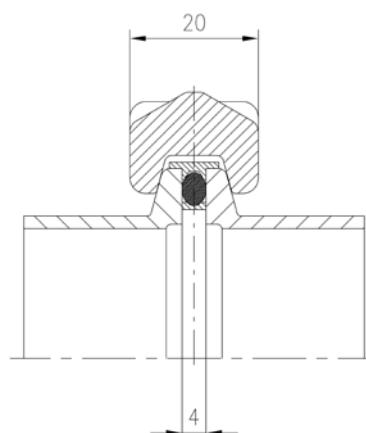
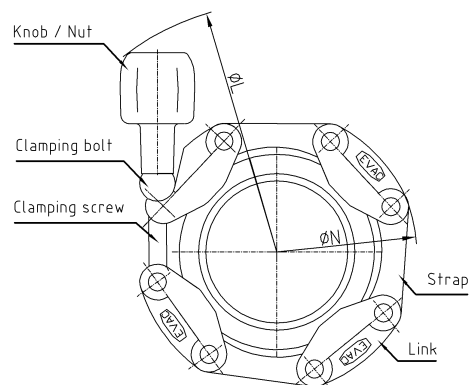
KF Chain Clamps, DN 16-63, light



DN	L	N	TORQUE (Nm)	No. OF LINKS
10/16	122	60	1.0	3
20/25	127	70	1.5	4
32/40	141	85	2.0	4
50	156	105	2.5	5
63	170	120	2.5	6

APPLICATIONS

- Cryogenics applications (Aluminum version with nut)
- Heated use (up to 200°C U-High-temperature version)
- Use of elastomer seals only
- Cost effective for use in Solar, LPCVD, and similar
- Vacuum up to 10^{-9} mbar



	TYPE	COMPOSITE/STEEL	COMPOSITE/SS	COMPOSITE HIGH-TEMP./SS	COMPOSITE U-HIGH-TEMP./SS
	DN	P/N			
	10/16	30.016009.111.716	30.016010.111.816	30.016012.131.916	30.016094.100.000
	20/25	30.025009.111.725	30.025010.111.825	30.025012.131.925	30.025094.100.000
	32/40	30.040009.111.740	30.040010.111.840	30.040012.131.940	30.040094.100.000
	50	30.050009.111.750	30.050010.111.850	30.050012.131.950	30.050094.100.000
	63	30.063009.111.763	30.063010.111.863	30.063012.131.963	30.063094.100.000
	Materials	Links	Composite Black	Composite Black	Composite Gray
Straps		Steel Zn Plated	Stainless Steel	Stainless Steel	Stainless Steel
Knob/Hex Nut		Composite Knob	Composite Knob	Composite Knob	Composite Knob
Bolt M5		Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
Clamping piece		Composite	Composite	Composite	Composite
Tightening		By hand	By hand	By hand	By hand
Range of Application	Vacuum	Rough/High	Rough/High	Rough/High	Rough/High
	Temperature range	-20... 60°C (80°C, 5h)	-20... 60°C (150°C, 12h)	-20... 100°C (150°C, 12h)	-20... 200°C
	Cryogenics	-	-	-	-
	Pressure	-	-	-	-
	Antimagnetic	-	Yes	Yes	Yes
	Radiation resistant	-	-	-	-
	Chemistry/Corrosion	-	Depends ¹	Depends ¹	Depends ¹
	Cleanroom suitable	Yes	Yes	Yes	Yes
	Electrical isolation	Yes	Yes	Yes	Yes
	Seals	Only elastomer	Only elastomer	Only elastomer	Only elastomer

M5 = Metric thread size 5 mm, Zn = Zinc, ¹ Composite parts, SS = Stainless Steel

	TYPE	ALUMINUM/STEEL	ALUMINUM/SS	ALUMINUM/STEEL WITH HEX NUT	ALUMINUM/SS WITH HEX NUT
	DN	P/N			
	10/16	30.016002.111.216	30.016015.111.516	30.016002.114.216	30.016015.114.516
	20/25	30.025002.111.225	30.025015.111.525	30.025002.114.225	30.025015.114.525
	32/40	30.040002.111.240	30.040015.111.540	30.040002.114.240	30.040015.114.540
	50	30.050002.111.250	30.050015.111.550	30.050002.114.250	30.050015.114.550
	63	30.063002.111.263	30.063015.111.563	30.063002.114.263	30.063015.114.563
	Materials	Links	Cast Aluminum	Cast Aluminum	Cast Aluminum
StrapS		Steel Zn plated	Stainless Steel	Steel Zn plated	Stainless Steel
Knob/Hex Nut		Composite Knob	Composite Knob	Hex Nut Stainless Steel	Hex Nut Stainless Steel
Bolt M5		Stainless Steel	Stainless Steel	Stainless Steel (Molykote)	Stainless Steel (Molykote)
Clamping piece		Aluminum	Aluminum	Aluminum	Aluminum
Tightening		By hand	By hand	By hand/Hex Key	By hand/Hex Key
Range of Application	Vacuum	Rough/High	Rough/High	Rough/High	Rough/High
	Temperature range	-20... 100°C	-20... 100°C	-271... 100°C	-271... 100°C
	Cryogenics	-	-	Yes	Yes
	Pressure	-	-	-	-
	Antimagnetic	-	Yes	-	Yes
	Radiation resistant	-	-	Yes	Yes
	Chemistry/Corrosion	-	-	-	-
	Cleanroom suitable	yes	Yes	Depends ²	Depends ²
	Electrical isolation	-	-	-	-
	Seals	Only elastomer	Only elastomer	Only elastomer	Only elastomer

M5 = Metric thread size 5 mm, Zn = Zinc, ² Bolt coating, SS = Stainless Steel

KF Chain Clamps, DN 16-63, standard

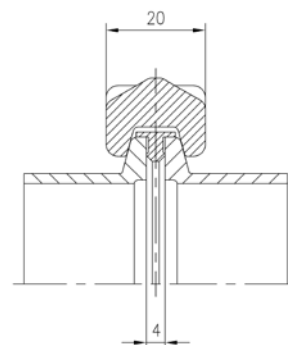
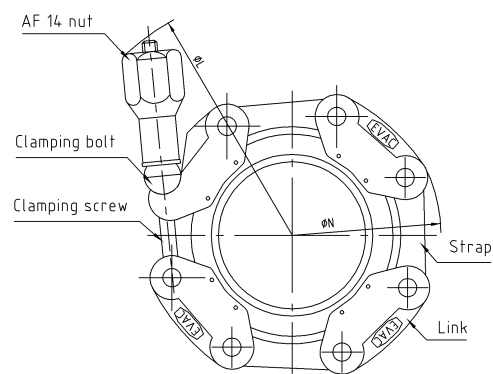


DN	L	TORQUE (Nm)		No. OF LINKS	P max* [bar]
		ELAST.	METAL		
10/16	115	1.0	2.5	3	100
20/25	125	1.5	3.0	3	80
32/40	135	2.0	4.5	4	40
50	152	2.5	5.0	5	20
63	160	2.5	5.0	6	10

*Max pressure only with chain clamp 30.xxx005.151.4xx and 30.xxx006.151.6xx

APPLICATIONS

- Food and beverage applications (Stainless Steel)
- Cryogenics applications (all versions)
- Heated use (up to 350°C with Nickel and Steel)
- Use of elastomer and metal seals
- Especially for UHV applications
- Vacuum up to 10^{-11} mbar



	TYPE	ALUMINUM / STEEL	ALUMINUM / SS	ALU TEFLON COATED / SS
	DN	P/N		
	10/16	30.016002.151.216	30.016015.151.516	30.016019.159.516
	20/25	30.025002.151.225	30.025015.151.523	30.025019.159.523
	32/40	30.040002.151.240	30.040015.151.540	30.040019.159.540
	50	30.050002.151.250	30.050015.151.550	30.050019.159.550
	63	30.063002.151.263	30.063015.151.563	30.063019.159.563
Materials	Links	Alu (forged)	Alu (forged)	Alu (forged)
	Straps	Steel Zn plated	Stainless Steel	Stainless Steel
	Hex Nut	Stainless Steel	Stainless Steel	Stainless Steel
	Bolt (Molykote)	Stainless Steel M5	Stainless Steel M5	Stainless Steel M5
	Clamping piece	Aluminum	Aluminum	Aluminum
	Tightening	Hex Key	Hex Key	Hex Key
Range of Application	Vacuum	Rough / High	Rough / High	Rough / High
	Temperature range	-271... 150°C	-271... 150°C	-271... 150°C
	Cryogenics	Yes	Yes	Yes
	Pressure	-	-	-
	Antimagnetic	-	Yes	Yes
	Radiation resistant	Yes	Yes	-
	Chemistry / Corrosion	-	-	Yes
	Cleanroom suitable	Depends ²	Depends ²	Depends ²
	Electrical isolation	-	-	-
	Seals	Metal / Elastomer	Metal / Elastomer	Metal / Elastomer

Chain clamp with 5 links for Aluminum flanges or special conditions, ² Bolt coating, M5 = Metric thread size 5 mm

	TYPE	STEEL NICKEL PLATED	STAINLESS STEEL
	DN	P/N	
	10/16	30.016006.151.616	30.016005.151.416
	20/25	30.025006.151.623	30.025005.151.423
	32/40	30.040006.151.640	30.040005.151.440
	50	30.050006.151.650	30.050005.151.450
	63	30.063006.151.663	30.063005.151.463
Materials	Links	Steel Nickel plated	Stainless Steel
	Straps	Stainless Steel	Stainless Steel
	Hex Nut	Stainless Steel	Stainless Steel
	Bolt (Molykote)	Stainless Steel M6	Stainless Steel M6
	Clamping piece	Stainless Steel	Stainless Steel
	Tightening	Hex Key	Hex Key
Range of Application	Vacuum	Rough / High / UHV	Rough / High / UHV
	Temperature range	-271... 150°C	-271... 350°C
	Cryogenics	Yes	Yes
	Pressure	Yes	Yes
	Antimagnetic	-	Yes
	Radiation resistant	Yes	Yes
	Chemistry / Corrosion	Depends ⁴	Yes
	Cleanroom suitable	Depends ²	Depends ²
	Electrical isolation	-	-
	Seals	Metal / Elastomer	Metal / Elastomer

Chain clamp with 5 links for Aluminum flanges or special conditions, ² Bolt coating, ⁴Nickel plating, M6 = Metric thread size 6 mm

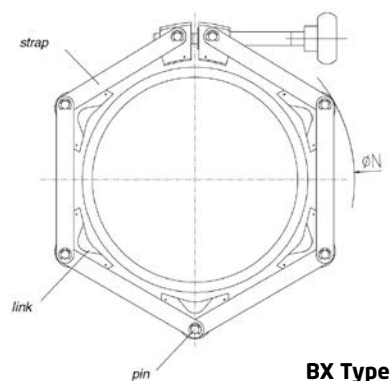
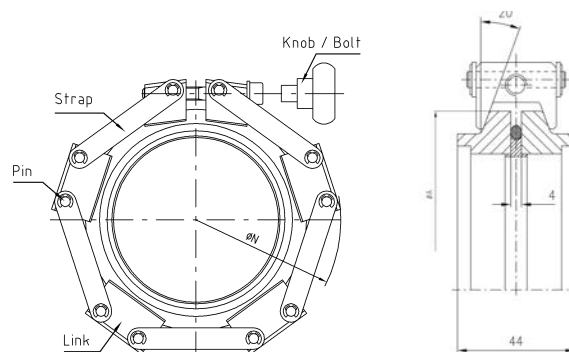
ISO Chain Clamps, DN 80-250, light



APPLICATIONS

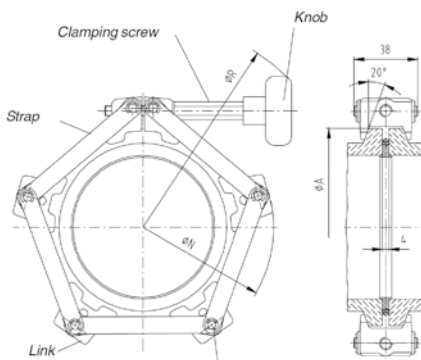
- Cryogenics applications (Aluminum version with nut)
- Heated use (up to 200°C U-High temp. version)
- Use of elastomer seals only
- Cost effective for use in Solar, LPCVD, and similar
- Vacuum up to 10^{-9} mbar

DN	A	N	TORQUE (Nm)
80	114	165	3.5
100	134	185	4.0
125	161	210	5.0
160	190	235	7.0
200	252	300	9.5
250	301	350	12



TYPE	ALU/SS (DN 80... 125 WITH PLASTIC KNOB)	ALU/SS WITH BOLT	STAINLESS STEEL	BX TYPE		
				ALUMINUM (DN 80... 125 WITH PLASTIC KNOB)	ALUMINUM/SS	
DN	P/N					
80	30.080015.211.508	30.080015.213.408	30.080003.211.308	30.080015.212.408	30.080015.211.408	
100	30.100015.211.510	30.100015.213.410	30.100003.211.310	30.100015.212.410	30.100015.211.410	
125	30.125015.211.512	30.125015.213.412	30.125003.211.312	30.125015.212.412	30.125015.211.412	
160	30.160015.211.516	-	30.160003.211.316	30.160015.212.416	30.160015.211.416	
200	30.200015.211.520	-	30.200003.211.320	-	-	
250	30.250015.211.525	-	30.250003.211.325	-	-	
Materials	Links	Aluminum Teflon coated	Aluminum Teflon coated	304	Aluminum Teflon coated	Aluminum Teflon coated
	Straps	316L	316L	316L	316L	316L
	Knob/Hex Nut	Composite (DN 80... 125)	-	-	GRP	-
	Bolt M5	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
	Pin	304	304	304	304	304
	Tightening	By hand/Hex key	Hex Key	Hex Key	By hand/Hex key	Hex Key
Range of Application	Vacuum	Rough/High	Rough/High	Rough/High	Rough/High	Rough/High
	Temperature range	-20... 100°C	-271... 150°C	-271... 315°C	-20... 100°C	-271... 150°C
	Cryogenics	-	Yes	Yes	-	Yes
	Pressure	-	-	Yes	-	-
	Antimagnetic	Yes	Yes	Yes	Yes	Yes
	Radiation resistant	-	-	yes	-	-
	Chemistry/ Corrosion	Depends ¹	Depends	Yes	Limited	Depends ²
	Cleanroom suitable	Yes	Yes	Depends ²	Yes	Yes
	Electrical isolation	-	-	-	-	-
Seals	Only elastomer	Only elastomer	Only elastomer	Only elastomer	Only elastomer	

GRP = Glass-fibre reinforced plastic, ¹ Aluminum parts, ² Bolt coating



DN	A	N	R	TORQUE (Nm)
80	122	154	244	3.5
100	127	172	256	4.0
125	141	200	278	5.0
160	156	220	360	7.0

	TYPE	COMPOSITE / SS	COMPOSITE / SS HIGH-TEMP.	COMPOSITE / SS U-HIGH-TEMP.
	DN	P/N		
	80	30.080010.221.808	30.080012.221.908	30.080094.200.000
	100	30.100010.221.810	30.100012.221.910	30.100094.200.000
	125	30.125010.221.812	30.125012.221.912	30.125094.200.000
	160	30.160010.221.816	30.160012.221.916	30.160094.200.000
Materials	Links	Composite	Composite	Composite
	Straps	316L	316L	316L
	Knob/Hex Nut	Composite	Composite	Composite
	Bolt	-	-	-
	Pin	304	304	304
	Tightening	By hand	By hand	By hand
Range of Application	Vacuum	Rough/High	Rough/High	Rough/High
	Temperature range	0... 60°C (80°C, 5h)	0... 100°C (150°C, 12h)	0... 200°C
	Cryogenics	-	-	-
	Pressure	-	-	-
	Antimagnetic	Yes	Yes	Yes
	Radiation resistant	-	-	-
	Chemistry/Corrosion	Depends	Depends	Depends
	Cleanroom suitable	Yes	Yes	Yes
	Electrical isolation	Yes	Yes	Yes
Seals	Only elastomer	Only elastomer	Only elastomer	

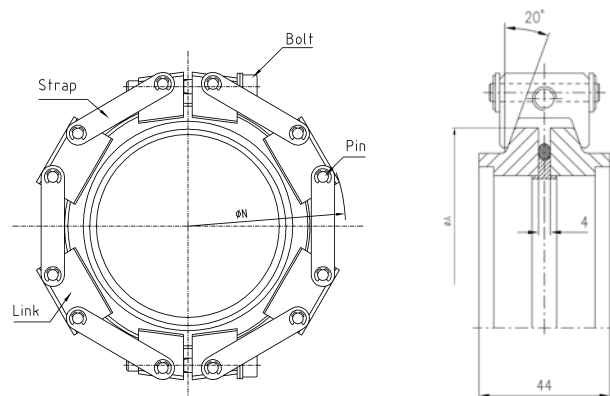
ISO Chain Clamps, DN 80-250, standard



APPLICATIONS

- High performance applications
- Cryogenics applications (Aluminum version with nut)
- Heated use (up to 350°C Stainless Steel version)
- Use in CVD applications, UHV, Accelerator, LPG, LNG, and similar
- Vacuum up to 10^{-11} mbar with metal seals

DN	A	N	TORQUE (Nm)	
			ELAST.	METAL
80	114	160	3.5	8.5
100	134	180	4.0	10
125	161	205	5.0	12.5
160	190	250	7.0	18
200	252	310	9.5	24
250	301	355	12	30



	TYPE	ALU/SS	ALU TEFLON COATED/SS	STAINLESS STEEL	ALU TEFLON COATED / SS, BX TYPE
	DN	P/N			
	80	30.080015.242.508	30.080019.249.508	30.080003.242.308	30.080015.242.408
	100	30.100015.242.510	30.100019.249.510	30.100003.242.310	30.100015.242.410
	125	30.125015.242.512	30.125019.249.512	30.125003.242.312	30.125015.242.412
	160	30.160015.242.516	30.160019.249.516	30.160003.242.316	30.160015.242.416
	200	30.200015.242.520	30.200019.249.520	30.200003.242.320	-
	250	30.250015.242.525	30.250019.249.525	30.250003.242.325	-
Materials	Links	Aluminum	Aluminum	Stainless Steel	Aluminum
	Straps	316L	316L	316L	316L
	Bolts (2x)	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
	Pins	304	304	304	304
	Tightening	Hex Key	Hex Key	Hex Key	Hex Key
Range of Application	Vacuum	Rough-/High-/UHV	Rough-/High-/UHV	Rough-/High-/UHV	Rough-/High-/UHV
	Temperature range	-271... 150°C	-271... 150°C	-271... 350°C	-271... 150°C
	Cryogenics	Yes	Yes	Yes	Yes
	Pressure	-	-	Yes	-
	Antimagnetic	Yes	Yes	Yes	Yes
	Radiation resistant	Yes	-	Yes	-
	Chemistry / Corrosion	Depends	Yes	Yes	Yes
	Cleanroom suitable	Depends	Depends	Depends	Depends
Electrical isolation	-	-	-	-	
	Seals	Metal/2mm	Metal/2mm	Metal/2mm	Metal/4-4.5mm

KF Elastomer Seals, DN 10/16-63, UHV

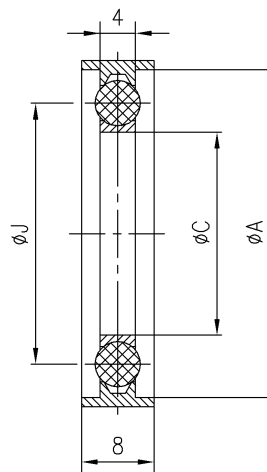
OUTER CENTER RING



APPLICATIONS

- Carriers made of Teflon, Aluminum or Stainless Steel 316L
- FEP multilayer material (Teflon with silicone core)
- FEP O-ring material for low temperatures down to -50°C
- High temperature Viton up to 200°C available
- Outer center ring for overpressure up to 20 bar
- Inner support ring for UHV applications
- Vacuum up to 10^{-9} mbar
- Inner support ring and outer center ring with intrinsic torque stop

DN	A	C	J
10/16	30	16	23
20/25	40	24	33
32/40	55	40	48
50	75	50	59
63	87	68	77



	TYPE	TEFLON / FEP	TEFLON / VITON	ALU / VITON	ALU / SS / VITON	STAINLESS STEEL / VITON
	DN	P/N				
	Centering	Outside				
	10/16	-	34.016035.121.616	34.016037.121.816	34.016034.121.516	34.016032.121.316
	20/25	34.025031.121.225	34.025035.121.625	34.025037.121.825	34.025034.121.525	34.025032.121.325
	32/40	34.040031.121.240	34.040035.121.640	34.040037.121.840	34.040034.121.540	34.040032.121.340
	50	34.050031.121.250	34.050035.121.650	34.050037.121.850	34.050034.121.550	34.050032.121.350
	63	34.063031.121.263	34.063035.121.663	34.063037.211.806	-	34.063032.211.306
Materials	Inner Ring	Teflon	Teflon	Aluminum	316L	316L
	Outer Ring	Teflon	Teflon	Aluminum	Aluminum	316L
	O-Ring	FEP	Viton	Viton	Viton	Viton
Range of Application	Vacuum	Rough- / High-	Rough- / High-	Rough- / High-	Rough- / High-	Rough- / High-
	Temperature range	-50... 200°C	-20... 200°C	-20... 200°C	-20... 200°C	-20... 200°C
	Cryogenics	-	-	-	-	-
	Leak rate (mbar.l.s ⁻¹)	<1.10 ⁻⁹	<1.10 ⁻⁹	<1.10 ⁻⁹	<1.10 ⁻⁹	<1.10 ⁻⁹
	Pressure	Yes	Yes	Yes	Yes	Yes
	Antimagnetic	Yes	Yes	Yes	Yes	Yes
	Radiation resistant	-	-	-	-	-
	Chemistry / Corrosion	Very good	Good	Good	Good	Good
	Cleanroom suitable	Yes	Yes	Yes	Yes	Yes
	Electrical isolation	Yes	Yes	-	-	-

FEP = Silicone O-Ring seamlessly coated with Teflon

Other material combinations are available on request.

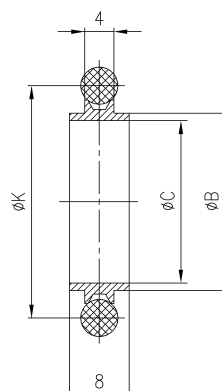
INNER CENTER RING



DN	B	C	K
16	17	16	25
25	26	24	35
40	41	40	49
50	52	50	61.5
63	70	68	80

APPLICATIONS

- Carriers made of Aluminum or Stainless Steel 316L
- Kalrez O-ring for high temperature up to 315°C
- High temperature Viton up to 200°C available
- Outer center ring for overpressure up to 20 bar
- Vacuum up to 10⁻⁹ mbar
- Inner center ring with intrinsic torque stop



	TYPE	STAINLESS STEEL / KALREZ	ALU / VITON	STAINLESS STEEL / VITON
	DN	P/N		
	Centering	Inside		
	10/16	34.016043.121.F16-iz	34.016037.121.816-iz	34.016032.121.316-iz
	20/25	34.025043.121.F25-iz	34.025037.121.825-iz	34.02032.121.325-iz
	32/40	34.040043.121.F40-iz	34.040037.121.840-iz	34.040032.121.340-iz
	50	34.050043.121.F50-iz	34.050037.121.850-iz	34.050032.121.350-iz
	63	-	34.063037.211.806	34.063032.211.306
Materials	Inner Ring	316L	Aluminum	316L
	O-Ring	Kalrez	Viton	Viton
Range of Application	Vacuum	Rough- /High-	Rough- /High-	Rough- /High-
	Temperature range	-10... 315°C	-20... 200°C	-20... 200°C
	Cryogenics	-	-	-
	Leak rate (mbar.l.s ⁻¹)	<1.10 ⁻⁹	<1.10 ⁻⁹	<1.10 ⁻⁹
	Pressure	-	-	-
	Antimagnetic	Yes	Yes	Yes
	Radiation resistant	-	-	-
	Chemistry / Corrosion	Excellent	Good	Good
	Cleanroom suitable	Yes	Yes	Yes
Electrical isolation	-	-	-	

Other material combinations are available on request.

KF Metal Seals, DN 16-63, UHV

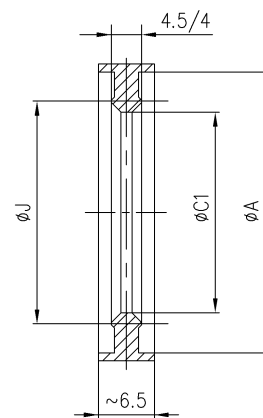
APPLICATIONS

- UHV applications up to 10^{-11} mbar
- Pressurized applications up to 20 bar
- Cryogenics applications down to -270°C
- Maximum temperature up to 150°C
- Flange seals reusable up to 10 times
- Radiation tolerant and nuclear applications
- Cleanroom compatible

KF ALUMINUM EDGE SEALS - OUTER CENTER RING



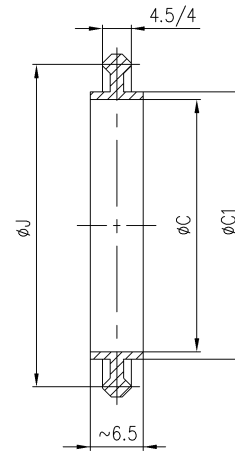
DN	A	C1	J
10/16	30	20	23
20/25	40	32	33
32/40	55	45	48
50	75	65	68
63	87	77	80



KF ALUMINUM EDGE SEALS - INNER CENTER RING



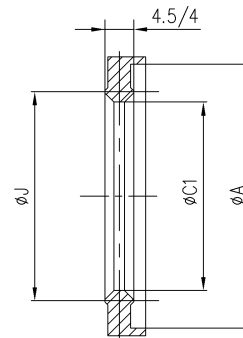
DN	C	C1	J
10/16	15	17	21
20/25	24	26	30
32/40	39	41	47
50	50	52	59
63	68	70	77



KF ALUMINUM EDGE SEALS - ONE-SIDE OUTER CENTER RING



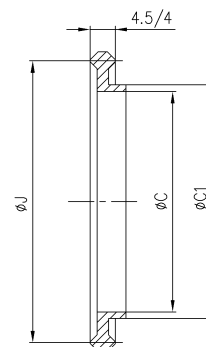
DN	A	C1	J
10/16	30	20	23
20/25	40	32	33
32/40	55	45	48
50	75	65	68
63	87	77	80



KF ALUMINUM EDGE SEALS - ONE-SIDE INNER CENTER RING



DN	C	C1	J
10/16	15	17	21
20/25	24	26	30
32/40	39	41	47
50	50	52	59
63	68	70	77



	TYPE	OUTSIDE CENTERING	INSIDE CENTERING	ONE-SIDE OUTER CENTERING	ONE-SIDE INNER CENTERING
	DN	P/N			
	10/16	34.016001.142.116-az	34.016001.142.116-iz	34.016001.142.116az1	34.016001.142.116iz1
	20/25	34.025001.142.125-az	34.025001.142.125-iz	34.025001.142.125az1	34.025001.142.125iz1
	32/40	34.040001.142.140-az	34.040001.142.140-iz	34.040001.142.140az1	34.040001.142.140iz1
	50	34.050001.142.150-az	34.050001.142.150-iz	34.050001.142.150az1	34.050001.142.150iz1
	63	34.063001.142.163-az	34.063001.142.163-iz	34.063001.142.163az1	34.063001.142.163iz1
Materials	Seal	Aluminum	Aluminum	Aluminum	Aluminum
Range of Application	Vacuum	Rough-/High-/UHV	Rough-/High-/UHV	Rough-/High-/UHV	Rough-/High-/UHV
	Temperature range	-271... 150°C	-271... 150°C	-271... 150°C	-271... 150°C
	Cryogenics	Yes	Yes	Yes	Yes
	Leak rate (mbar.l.s ⁻¹)	<1.10 ⁻¹¹	<1.10 ⁻¹¹	<1.10 ⁻¹¹	<1.10 ⁻¹¹
	Pressure	Yes	Yes	Yes	Yes
	Antimagnetic	Yes	Yes	Yes	Yes
	Radiation resistant	Yes	Yes	Yes	Yes
	Chemistry/Corrosion	Limited	Limited	Limited	Limited
	Cleanroom suitable	Yes	Yes	Yes	Yes
Electrical isolation	-	-	-	-	

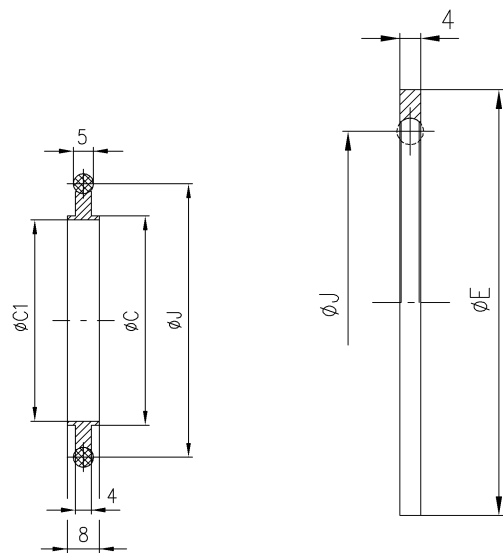
Other material combinations are available on request.

ISO Elastomer Seals, DN 80-250, UHV



APPLICATIONS

- Carriers made of Aluminum, or Stainless Steel 316L
- Kalrez O-ring for high temperature up to 315°C
- High temperature Viton up to 200°C available
- Vacuum up to 10^{-9} mbar
- Inner center ring with intrinsic torque stop



With inside center ring

Outer ring required for pressure applications

DN	C	C1	J	E
80	83	81	98	112
100	102	100	118	132
125	127	125	144	157
160	153	151	167	182
200	213	211	227	242
250	261	259	275	292

	TYPE	ALU/VITON	STAINLESS STEEL/ VITON	TEFLON/VITON	TEFLON/FEP
	DN	P/N			
	80	34.080037.211.808	34.080032.211.308	34.080035.211.508	34.080031.211.208
	100	34.100037.211.810	34.100032.211.310	34.100035.211.510	34.100031.211.210
	125	34.125037.211.812	34.125032.211.312	34.125035.211.512	34.125031.211.212
	160	34.160037.211.816	34.160032.211.316	34.160035.211.516	34.160031.211.216
	200	34.200037.211.820	34.200032.211.320	34.200035.211.520	34.200031.211.220
	250	34.250037.211.825	34.250032.211.325	34.250035.211.525	34.250031.211.225
Materials	Inner Ring	Teflon	Teflon	Aluminum	316L
	Outer Ring	Teflon	Teflon	Aluminum	Aluminum
	O-Ring	FEP	Viton	Viton	Viton
Range of Application	Vacuum	Rough-/High-	Rough-/High-	Rough-/High-	Rough-/High-
	Temperature range	-50... 200°C	-20... 200°C	-20... 200°C	-20... 200°C
	Cryogenics	-	-	-	-
	Leak rate (mbar.l.s ⁻¹)	<1.10 ⁻⁹	<1.10 ⁻⁹	<1.10 ⁻⁹	<1.10 ⁻⁹
	Pressure	Yes	Yes	Yes	Yes
	Antimagnetic	Yes	Yes	Yes	Yes
	Radiation resistant	-	-	-	-
	Chemistry/Corrosion	Very good	Good	Good	Good
	Cleanroom suitable	Yes	Yes	Yes	Yes
Electrical isolation	Yes	Yes	-	-	

FEP = Silicone O-Ring seamlessly coated with Teflon

	TYPE	STAINLESS STEEL/ KALREZ	OUTER RING (OPTIONAL*)
	DN	P/N	
	80	34.080043.211.F08	34.080001.289.108
	100	34.100043.211.F10	34.100001.289.110
	125	34.125043.211.F12	34.125001.289.112
	160	34.160043.211.F16	34.160001.289.116
	200	34.200031.211.F20	34.200001.289.120
	250	34.250043.211.F25	34.250001.289.125
Materials	Centering Ring	316L	-
	O-Ring	Kalrez	-
	Outer Ring	-	Aluminum
Range of Application	Vacuum	Rough-/High-	Rough-/High-
	Temperature range	-10... 315°C	-50... 200°C
	Cryogenics	-	-
	Leak rate (mbar.l.s ⁻¹)	<1.10 ⁻⁹	-
	Pressure	With Outer Ring	With Outer Ring
	Antimagnetic	Yes	Yes
	Radiation resistant	-	-
	Chemistry/Corrosion	Excellent	-
	Cleanroom suitable	Yes	Yes
Electrical isolation	-	-	

*Optional: with outer suitable for pressure applications

Other material combinations are available on request.

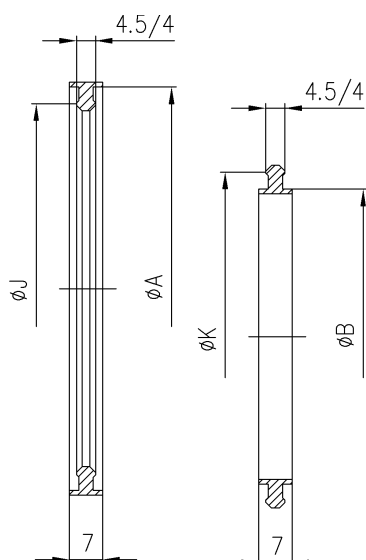
ISO Aluminum Metal Seals for Tapered Flanges, DN 80-250, UHV



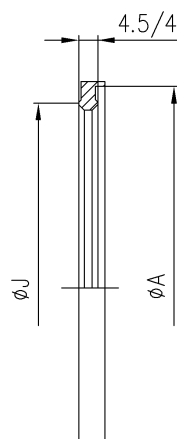
APPLICATIONS

- UHV applications up to 10^{-11} mbar
- Pressurized applications up to 20 bar
- Cryogenics applications down to -270°C
- Maximum temperature up to 150°C
- Flange seals reusable up to 10 times
- Radiation tolerant and nuclear applications
- Cleanroom compatible

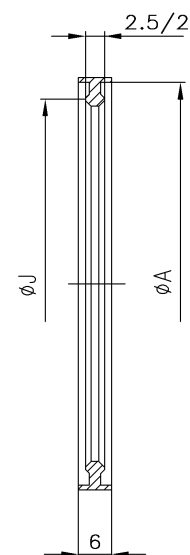
DN	A	J (4 mm)	J (2 mm)	B	K
80	114	107	108	83	90
100	134	127	128	102	109
125	161	154	155	127	134
160	190	183	184	153	160
200	252	245	246	213	220
250	301	294	295	261	268



**Outer and Inner center ring
(edge seal 4 mm)**



**One-side center ring
(4 mm)**



**Outer center ring
(edge seal 2 mm)**

These Aluminum seals must be used only with EVAC flanges.

DN	ALUMINUM OUTER CENTER RING* (4 mm)	ALUMINUM INNER CENTER RING** (4 mm)	ALUMINUM ONE-SIDE CENTERING* (4 mm)	ALUMINUM OUTER CENTER RING (2 mm)
80	34.080001.272.108	34.080001.342.108	34.080001.272.108az1	34.080001.271.108
100	34.100001.272.110	34.100001.342.110	34.100001.272.110az1	34.100001.271.110
125	34.125001.272.112	34.125001.342.112	34.125001.272.112az1	34.125001.271.112
160	34.160001.272.116	34.160001.342.116	34.160001.272.116az1	34.160001.271.116
200	34.200001.272.120	34.200001.342.120	34.200001.272.120az1	34.200001.271.120
250	34.250001.272.125	34.250001.342.125	34.250001.272.125az1	34.250001.271.125

*Only for chain clamp BX type

**Can also be used with ISO-F flanges

ISO Aluminum Metal Seals for ISO K Flanges, DN 80-250, UHV

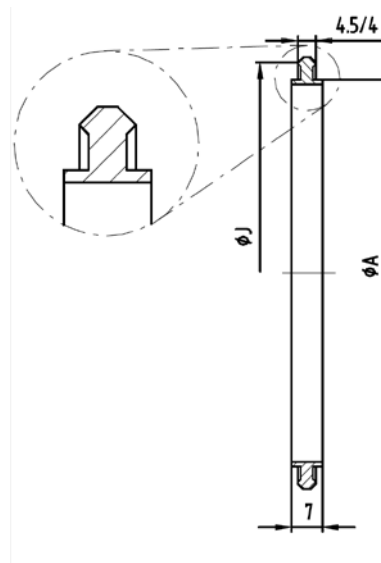


APPLICATIONS

- UHV applications up to 10^{-11} mbar
- Cryogenics applications down to -270°C
- Maximum temperature up to 150°C
- Flange seals reusable up to 10 times
- Radiation tolerant and nuclear applications
- Cleanroom compatible

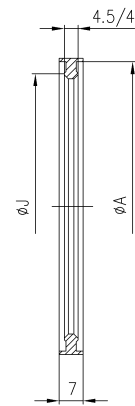
DN	A	J	ALUMINUM INNER CENTER RING** (4 mm)
63	70	77	34.063001.342.106
80	83	103	34.080001.342.108
100	102	123	34.100001.342.110
125	127	148	34.125001.342.112
160	153	160	34.160001.342.116
200	213	220	34.200001.342.120
250	261	268	34.250001.342.125
320	318	325	34.320001.342.132

**Can also be used with ISO-F flanges



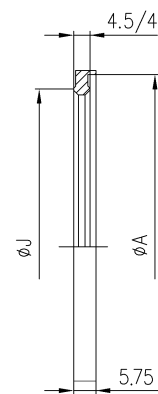
USE WITH CLAMPS SCREWS

DN	A	J	ALUMINUM OUTER CENTERED (BOTH SIDES CENTERING)
63	95	88	34.063001.341.106
80	110	103	34.080001.341.108
100	130	123	34.100001.341.110
125	155	148	34.125001.341.112
160	180	173	34.160001.341.116
200	240	233	34.200001.341.120
250	290	283	34.250001.341.125
320	370	363	34.320001.341.132
400	450	443	34.400001.341.140
500	550	543	34.500001.341.150
630	690	683	34.630001.341.163



USE WITH WALL CLAMPS

DN	A	J	ALUMINUM ONE-SIDE CENTERING (4 mm)
63	95	88	34.063001.341.106-Z1
80	110	103	34.080001.341.108-Z1
100	130	123	34.100001.341.110-Z1
125	155	148	34.125001.341.112-Z1
160	180	173	34.160001.341.116-Z1
200	240	233	34.200001.341.120-Z1
250	290	283	34.250001.341.125-Z1
320	370	363	34.320001.341.132-Z1
400	450	443	34.400001.341.140-Z1
500	550	543	34.500001.341.150-Z1
630	690	683	34.630001.341.163-Z1



ISO-Tapered Components, DN 63-250

TAPERED FLANGES, BLANKING PLATES, WELD STUBS, VIEWPORTS

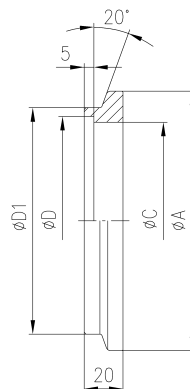
APPLICATIONS

- UHV applications up to 10^{-11} mbar
- Temperature range: -271°C to 300°C
- Temperature range Viewports: -30°C to 280°C
- Antimagnetic versions on request
- Radiation tolerant and cryogenics applications
- Cleanroom compatible
- Suitable for metal and elastomer type seals
- Extreme surface precision and flatness even under high bending

ISO-TAPERED FLANGES, STAINLESS STEEL

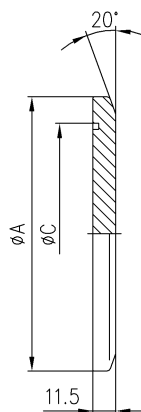
DN	A	C	D	D1	P/N
63*	87	70	-	76	32.063003.111.563
80	114	83	88.9	97	32.080003.210.308
100	134	102	108	117	32.100003.210.310
125	161	127	133	144	32.125003.210.312
160	190	153	159	168	32.160003.210.316
200	252	213	219.1	230	32.200003.210.320
250	301	261	273	279	32.250003.210.325

*total length = 30 mm



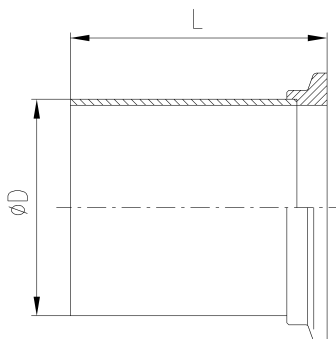
ISO-TAPERED BLANKING PLATES, STAINLESS STEEL

DN	A	C	P/N
63	87	70	32.063003.120.563
80	114	83	32.080003.220.308
100	134	102	32.100003.220.310
125	161	127	32.125003.220.312
160	190	153	32.160003.220.316
200	252	213	32.200003.220.320
250	301	261	32.250003.220.325



ISO-TAPERED WELD STUBS, STAINLESS STEEL

DN	D	L	P/N
63	76	60	32.063003.112.563
80	88.9	100	33.080003.222.308
100	108	100	33.100003.222.310
125	133	100	33.125003.222.312
160	159	100	33.160003.222.316
200	219.1	100	33.200003.222.320
250	273	100	33.250003.222.325



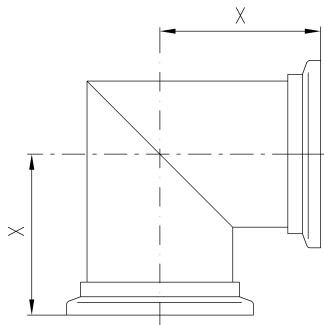
TAPERED FITTINGS

APPLICATIONS

- Extreme UHV up to 10^{-11} mbar
- Stainless Steel (304) for hassle free operations
- Temperature range: -270 to 350°C
- Antimagnetic
- Radiation tolerant and cryogenics applications
- Cleanroom compatible
- Suitable for metal and elastomer type seals
- Extreme surface precision, and flatness even under high bending

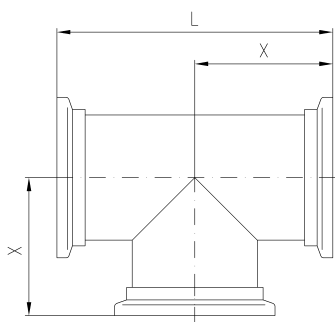
ISO-TAPERED ELBOWS, STAINLESS STEEL

DN	X	P/N
63	88	33.063003.150.563
80	98	33.080003.250.308
100	108	33.100003.250.310
125	118	33.125003.250.312
160	138	33.160003.250.316
200	178	33.200003.250.320
250	208	33.250003.250.325



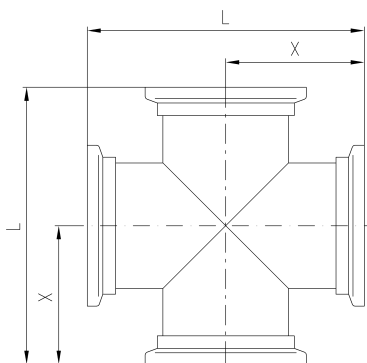
ISO-TAPERED TEES, STAINLESS STEEL

DN	X	L	P/N
63	88	176	33.063003.160.563
80	98	196	33.080003.260.308
100	108	216	33.100003.260.310
125	118	136	33.125003.260.312
160	138	276	33.160003.260.316
200	178	356	33.200003.260.320
250	208	416	33.250003.260.325



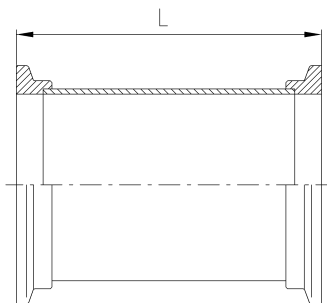
ISO-TAPERED CROSSES, STAINLESS STEEL

DN	X	L	P/N
63	88	176	33.063003.170.563
80	98	196	33.080003.270.308
100	108	216	33.100003.270.310
125	118	136	33.125003.270.312
160	138	276	33.160003.270.316
200	178	356	33.200003.270.320
250	208	416	33.250003.270.325



ISO-TAPERED TUBES, STAINLESS STEEL

DN	L	P/N
63	176	33.063003.111.563
80	196	33.080003.244.308
100	216	33.100003.244.310
125	136	33.125003.244.312
160	276	33.160003.244.316
200	356	33.200003.244.320
250	416	33.250003.244.325



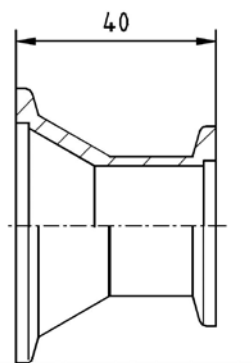
KF Reducers, DN 16-63, UHV



APPLICATIONS

- Extreme UHV up to 10^{-11} mbar
- Temperature range Aluminum: -271°C to 150°C
- Temperature range Stainless: -271°C to 350°C
- Cryogenics application
- Antimagnetic
- Radiation resistant
- Cleanroom compatible
- Suitable for metal and elastomer type seals

DN	P/N ALUMINUM	P/N SS 304
25/16	33.025001.140.121	33.025003.140.321
40/16	33.040001.140.141	33.040003.140.341
40/25	33.040001.140.142	33.040003.140.342
50/16	33.050001.140.151	33.050003.140.351
50/25	33.050001.140.152	33.050003.140.352
50/40	33.050001.140.154	33.050003.140.354
63/50	33.063001.140.165	33.063003.140.365



ISO-Tapered Metal Bellows / Metal Hoses, DN 63-250, UHV

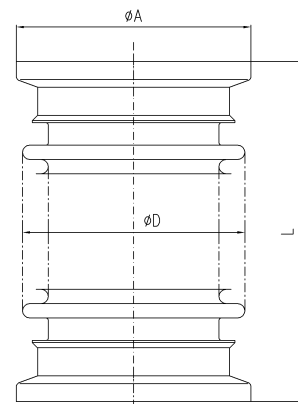


APPLICATIONS

- Extreme UHV up to 10^{-11} mbar
- Pressure max for tapered metal hoses DN 63: 0.5 bar (Only with chain clamps 30.xxx005.151.4xx and 30.xxx005.6 and outer centered seals)
- Temperature range: -200°C to 350°C
- Cryogenics applications
- Antimagnetic
- For radiation hardened
- Stainless Steel for hassle free operation
- Extreme surface precision and flatness even under high bending

ISO-TAPERED METAL BELLOWS, STAINLESS STEEL

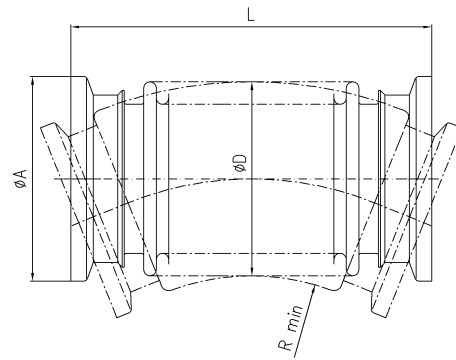
DN	A	D	L	AXIAL TRAVEL (± mm)	LATERAL TRAVEL (± mm)	MAX. ANGLE (±°)	P/N
63	87	84	100	17.0	6.5	26.0	35.063089.103.363
80	114	101	120	16.0	4.1	20.2	35.080089.221.308
100	134	120	120	15.0	3.0	15.0	35.100089.221.310
125	161	154	120	15.7	2.1	12.9	35.125089.221.312
160	190	173	200	27.5	8.0	20.0	35.160089.223.316



ISO-TAPERED METAL HOSES, STAINLESS STEEL

DN	A	D	L	Rmin	P/N
63	87	79	250	100	35.063086.111.363
63	87	79	500	180	35.063086.112.363
63	87	79	750	180	35.063086.113.363
63	87	79	1000	180	35.063086.114.363
80	114	96	250	150	35.080086.271.308
100	134	127	250	550	35.100086.271.310
125	161	152	250	850	35.125086.271.312
160	190	174	500	1150	35.160086.272.316

Other lengths are available on request.



CeFiX Chain Clamps, DN 16-63, UHV

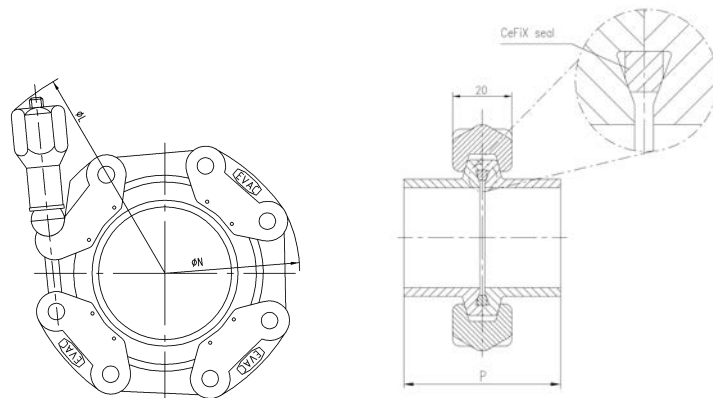


APPLICATIONS

- Food and beverage applications (Stainless Steel)
- Cryogenics applications (all versions)
- Heated use (up to 350°C with Nickel and Steel)
- Oven applications (seals: Al: -271°C to 150°C, Cu: -271°C to 350°C, Ni: -271°C to 450°C)
- Radiation tolerant
- Especially for UHV applications
- Vacuum up to 10⁻¹¹ mbar
- Pressure up to 300 bar (Steel with CeFiX metal seals)
- For antimagnetic requirements (Stainless Steel only)

DN	L	N	P	TORQUE (Nm)			No. OF LINKS
				ALU.	COPPER	NICKEL	
16	110	60	44	2.0	3.5	6.0	3
25	125	70	44	2.5	5.0	8.0	4
40	140	85	54	3.0	6.0	10.0	5
50	152	105	60	4.5	8.5	-	5
63	162	112	60	6.0	10.0	-	6*

*2 catches

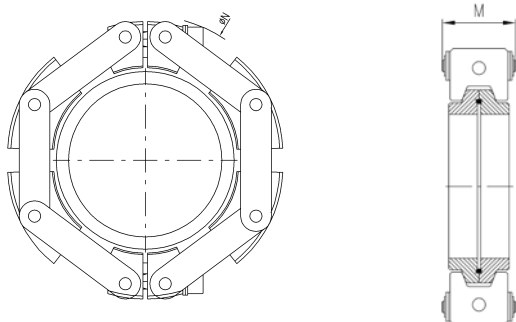


DN 63 chain clamps
(2 catches)

DN 16-50 chain clamps
(1 catch)

	TYPE	STAINLESS STEEL	NICKEL PLATED STEEL
	DN	P/N	
	16	30.016005.151.416	30.016006.151.616
	25	30.025005.151.425	30.025006.151.625
	40	30.040005.151.441	30.040006.151.641
	50	30.050005.151.450	30.050006.151.650
	63	30.063005.151.463	30.063006.151.663
Range of Application	Vacuum	Rough- /High- /UHV	Rough- /High- /UHV
	Temperature range	-271... 350°C	-271... 450°C
	Cryogenics	Yes	Yes
	Leak rate (mbar.l.s ⁻¹)	<1.10 ⁻¹¹	<1.10 ⁻¹¹
	Pressure	Yes	Yes
	Antimagnetic	Yes	Yes
	Radiation resistant	Yes	Yes
	Chemistry / Corrosion	Yes	Yes
	Cleanroom suitable	Depends	Depends
Electrical isolation	-	-	

CeFiX Chain Clamps, DN 80-250, UHV



DN	N	M	TORQUE (Nm)			No. OF LINKS
			ALU.	COPPER	NICKEL	
80	155	45	9	18	30	5
100	192	50	18	36	60	6
160	256	64	27	54	90	6
200	310	68	36	72	120	10
250	360	68	36	84	140	10

APPLICATIONS

- Extreme performance application (nuclear, space, hydraulics...)
- Ultra wide temperature range (-270°C to +450°C, Ni seal)
- Cryogenics applications (all metal seals)
- Oven applications (seals: Cu +350°C, Ni +450°C, Al +150°C)
- Use for UHV and overpressure (up to 100 bar with Ni seal)
- Custom versions up to 300 bar
- CeFiX seals reusable up to 10 times

	TYPE	STAINLESS STEEL
	DN	P/N
	80	30.080005.522.308
	100	30.100005.522.310
	160	30.160005.522.316
	200	30.200005.522.320
	250	30.250005.522.325
Range of application	Vacuum	Rough- /High- /UHV
	Temperature range	-271... 150°C
	Cryogenics	Yes
	Leak rate (mbar.l.s ⁻¹)	<1.10 ⁻¹¹
	Pressure	Yes
	Antimagnetic	Yes
	Radiation resistant	Yes
	Chemistry / Corrosion	Yes
	Cleanroom suitable	Limited
Electrical isolation	-	

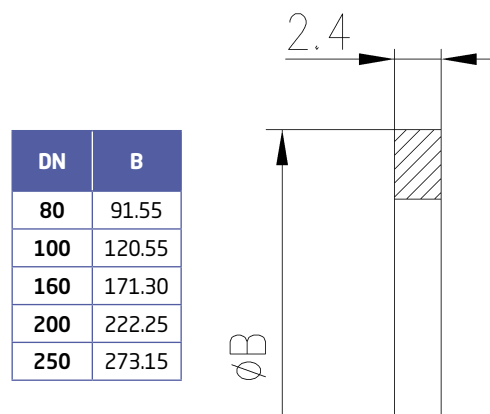
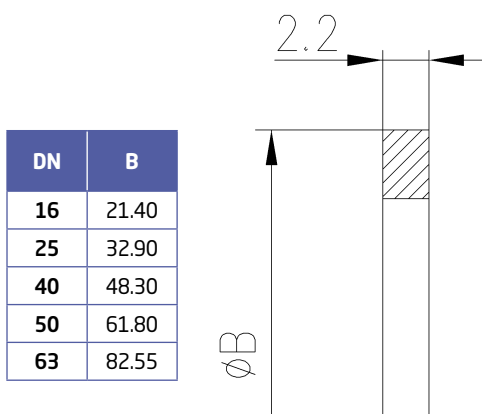
CeFiX Seals, DN 16-63, DN 80-250, UHV



APPLICATIONS

- Seals reusable up to 10 times
- Use for cryogenics applications down to -271°C
- Use for high temperature applications
- Radiation tolerant
- Use for overpressure applications

G



TYPE	ALUMINUM	OFS COPPER	OFS COPPER SILVER-PLATED	NICKEL
DN	P/N			
16	34.016001.663.101	34.016070.663.401	34.016073.663.901	34.016068.663.601
25	34.025001.663.102	34.025070.663.402	34.025073.663.902	34.025068.663.602
40	34.040001.663.104	34.040070.663.404	34.040073.663.904	34.040068.663.604
50	34.050001.663.105	34.050070.663.405	34.050073.663.905	-
63	34.063001.663.106	34.063070.663.406	34.063073.663.906	-

TYPE	ALUMINUM	OFS COPPER	OFS COPPER SILVER-PLATED	NICKEL
DN	P/N			
80	34.080001.563.108	34.080070.563.408	34.080073.563.908	34.080068.563.608
100	34.100001.563.108	34.100070.563.410	34.100073.563.910	34.100068.563.610
160	34.160001.563.116	34.160070.563.416	34.160073.563.916	34.160068.563.616
200	34.200001.563.120	34.200070.563.420	34.200073.563.920	34.200068.563.620
250	34.250001.563.125	34.250070.563.425	34.250073.563.925	34.250068.563.625
Vacuum	Rough- /High- /UHV	Rough- /High- /UHV	Rough- /High- /UHV	Rough- /High- /UHV
Temperature range	-271... 150°C	-271... 350°C	-271... 350°C	-271... 450°C
Cryogenics	Yes	Yes	Yes	Yes
Leak rate (mbar.l.s ⁻¹)	<1.10 ⁻¹¹	<1.10 ⁻¹¹	<1.10 ⁻¹¹	<1.10 ⁻¹¹
Pressure	Yes	Yes	Yes	Yes
Antimagnetic	Yes	Yes	Yes	Yes
Radiation resistant	Yes	Yes	Yes	Yes
Chemistry / Corrosion	Yes	Yes	Yes	Yes
Cleanroom suitable	Limited	Limited	Limited	Limited
Electrical isolation	-	-	-	-

Other material combinations are available on request.

CeFiX Components, DN 16-63, DN 80-250, UHV

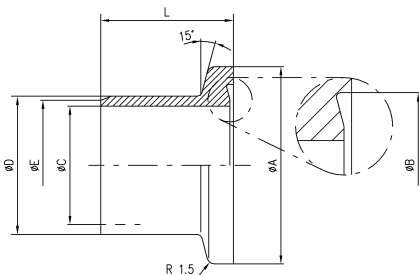
CeFiX FLANGES, CeFiX BLANKING PLATES

APPLICATIONS

- UHV applications up to 10^{-11} mbar
- Pressurized applications up to 100 bar
- Cryogenics applications down to -270°C
- Oven applications up to 350°C (Cu seals), 450°C (Ni seals)
- Flange seals reusable up to 10 times (provided no scratches)
- 316L Stainless Steel for nuclear and military applications

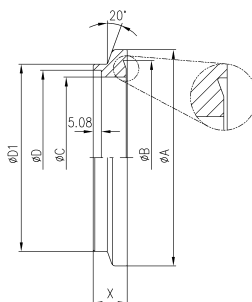
CeFiX FLANGES, DN 16-63, STAINLESS STEEL 316L

DN	A	B	C	D	L	P/N
16	30	21.4	16	20	22	32.016005.631.316
25	40	32.9	24	28	22	32.025005.631.325
40	55	48.3	40	44.5	27	32.040005.631.340
50	75	61.8	50	57	30	32.050005.637.350
63	87	82.5	70	76	30	32.063005.631.363



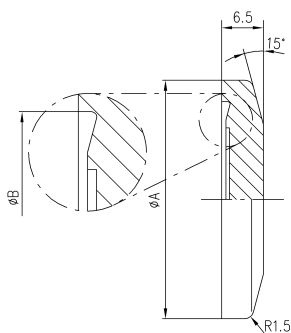
CeFiX FLANGES, DN 80-250, STAINLESS STEEL 316L

DN	A	B	C	D	D1	X	P/N
80	104.8	91.60	76.5	82.6	86	20	32.080005.531.308
100	134.0	120.65	100	108.4	117	20	32.100005.531.310
160	190.0	171.45	150	159.3	168	20	32.160005.531.316
200	242.0	222.30	200	205.3	218	25	32.200005.531.320
250	292.0	273.15	250	256.3	270	30	32.250005.531.325



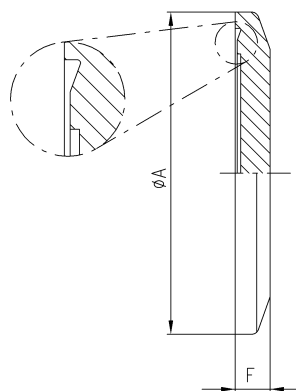
CeFiX BLANKING PLATES, DN 16-63, STAINLESS STEEL 316L

DN	A	B	P/N
16	30	21.4	32.016005.640.316
25	40	32.9	32.025005.640.325
40	55	48.3	32.040005.640.340
50	75	61.8	32.050005.640.350
63	87	82.5	32.063005.640.363



CeFiX BLANKING PLATES, DN 80-250, STAINLESS STEEL 316L

DN	A	F	P/N
80	104.8	9.0	32.080005.540.308
100	134.0	12.5	32.100005.540.310
160	190.0	13.5	32.160005.540.316
200	242.0	13.5	32.200005.540.320
250	292.0	14.0	32.250005.540.325



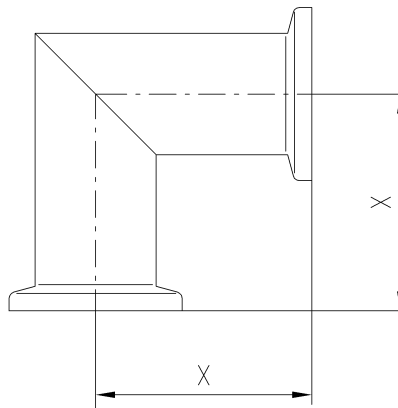
CeFiX FITTINGS

APPLICATIONS

- UHV applications up to 10^{-11} mbar
- Pressurized applications up to 100 bar
- Cryogenics applications down to -270°C
- Oven applications up to 350°C (Cu seals), 450°C (Ni seals)
- Flange seals reusable up to 10 times (provided no scratches)

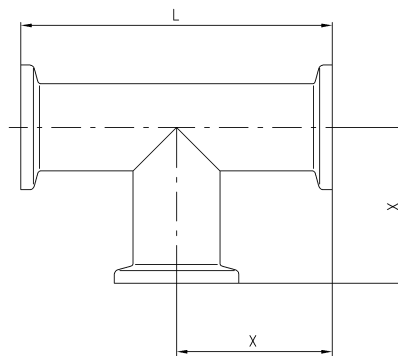
CeFiX ELBOWS, DN 16-63, STAINLESS STEEL 316 L

DN	X	P/N
16	38	33.016005.651.316
25	52	33.025005.651.325
40	63	33.040005.651.340
50	82	33.050005.651.350
63	105	33.063005.651.363



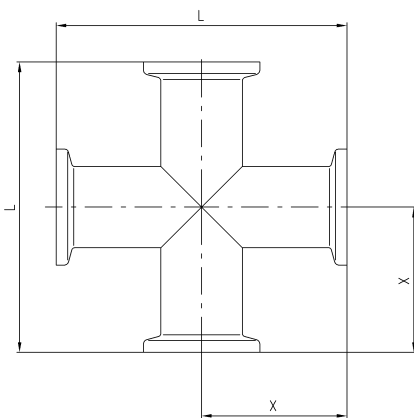
CeFiX TEES, DN 16-63, STAINLESS STEEL 316 L

DN	X	L	P/N
16	38	76	33.016005.661.316
25	52	104	33.025005.661.325
40	63	126	33.040005.661.340
50	82	164	33.050005.661.350
63	105	210	33.063005.661.363



CeFiX CROSSES, DN 16-63, STAINLESS STEEL 316 L

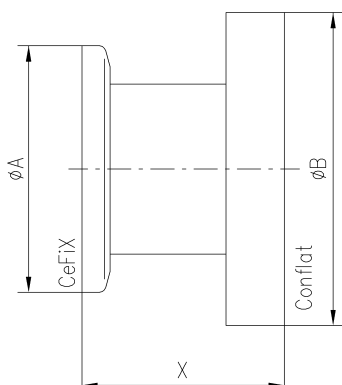
DN	X	L	P/N
16	38	76	33.016005.671.316
25	52	104	33.025005.671.325
40	63	126	33.040005.671.340
50	82	164	33.050005.671.350
63	105	210	33.063005.671.363



CeFiX TO CF ADAPTORS, DN 16-63, STAINLESS STEEL*

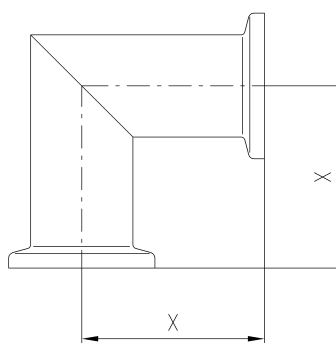
DN	A	B	X	P/N
16	30	34	30	33.016003.68A.301/01
25	40	54	45	33.025003.68A.302/02
40	55	70	45	33.040003.68A.304/04
50	75	86	50	33.050003.68A.305/05
63	87	114	60	33.063003.58A.306/06

*304/316 L



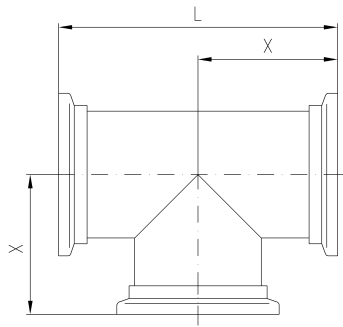
CeFiX ELBOWS, DN 80-250, STAINLESS STEEL 316 L

DN	X	P/N
80	110	33.080005.552.308
100	135	33.100005.552.310
160	167	33.160005.552.316
200	210	33.200005.552.320
250	254	33.250005.552.325



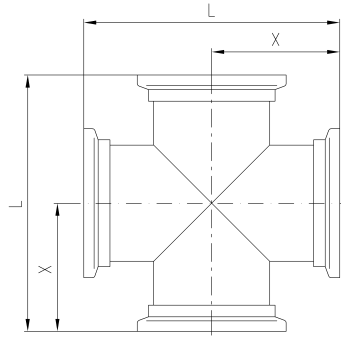
CeFiX TEES, DN 80-250, STAINLESS STEEL 316 L

DN	X	L	P/N
80	110	220	33.080005.562.308
100	135	270	33.100005.562.310
160	167	334	33.160005.562.316
200	210	420	33.200005.562.320
250	254	508	33.250005.562.325



CeFiX CROSSES, DN 80-250, STAINLESS STEEL 316 L

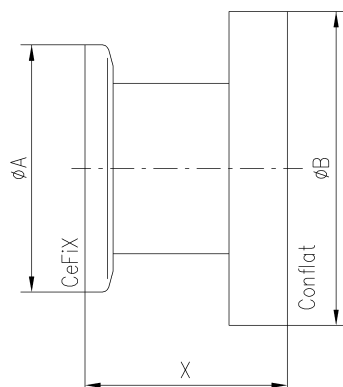
DN	X	L	P/N
80	110	220	33.080005.572.308
100	135	270	33.100005.572.310
160	167	334	33.160005.572.316
200	210	420	33.200005.572.320
250	254	508	33.250005.572.325



CeFiX TO CF ADAPTORS, DN 80-250, STAINLESS STEEL*

DN	A	B	X	P/N
100	134	152	80	33.100003.58A.310/10
160	190	203	86	33.160003.58A.316/16
200	242	254	90	33.200003.58A.320/20
250	292	305	90	33.250003.58A.325/25

*304 / 316 L





VACUUM GLASS & QUARTZ COMPONENTS

- KF Chain Clamps
for Glass Components DN 10/16-63 H 04
- ISO Chain Clamps
for Glass Components DN 80-160..... H 06
- KF Elastomer Seals
for Glass Components DN 10/16-63 H 08
- ISO Elastomer Seals
for Glass Components DN 80-160..... H 10
- KF/ISO-Tapered Glass
& Quartz Components DN 10-63, DN 80-160..... H 13
- KF Teflon Bellows DN 10/16-63 H 19
- KF, ISO K, CF Glass to Metal Adaptors H 20

Neyco provides glass components for ultra-pure processes. Glass is highly resistant to water and most chemicals and can be thoroughly cleaned and sterilized, which ensures that your processes are cleaner than with Stainless Steel or Aluminum.



Several qualities are available according to the kind of component:

- Duran (standard or optical quality)
- Kodial
- Pyrex
- Quartz (standard or optical quality)

 **See Section A - Vacuum Guide** in this catalogue about technical properties of the different Glasses.

The transition from glass to metal is no longer a problem but simply a matter of connecting two flanges. Vacuum measuring devices can, for example, easily be connected to glass systems by means of metal flanges.

Blank flanges can be used as inspection glasses. Optical blank flanges (parallel ϕ , level $< 3\mu\text{m}$) are available. This allows measurements with IR, UV or visible light.

In metal systems, adapters made from glass can be used for electric insulation.

Applications

- CVD and PVD processes
- Plasma etching and cleaning processes
- UV, IR and laser measurement
- High frequency and microwave supported processes
- Physical / chemical experiments
- Inspection glasses, flow rate observation



Properties

- Antimagnetic
- Radiation resistant
- Suitable for cleanrooms
- Useable only with elastomer seals

KF GLASS FLANGES

The flange dimensions are identical to the KF flanges, with the exception of the side width on the outside diameter, which is 4 mm instead of 3 mm. The larger dimension makes the glass flanges stronger to prevent cracking when the chain is tightened. The (compressed) seal ring width is therefore only 2 mm. Connection to a standard KF flange is always possible with the aid of a wider seal (3 mm).

ISO-TAPERED GLASS FLANGES

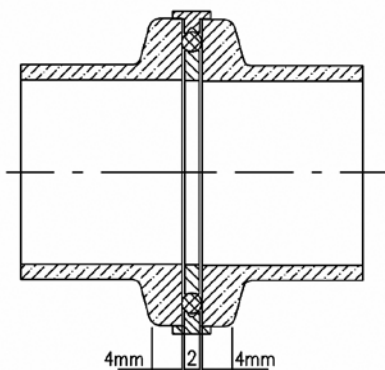
ISO-Tapered glass flanges can be directly mounted on ISO-Tapered metal flanges. DN 80 to 125 can be directly mounted on ISO F metal flanges (with plastic wall clamps).

ELASTOMER SEALS FOR KF AND ISO-TAPERED GLASS FLANGES

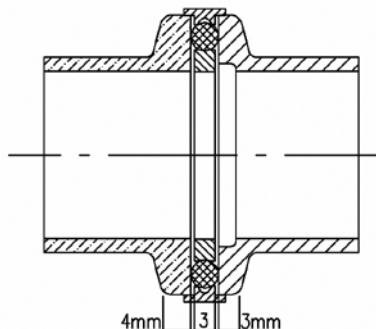
Two sealing widths are available: 2mm and 3mm. Since the glass flanges have a 1 mm thicker flange, the sealing width (compressed) is no longer 4 mm (for metal to metal connection) but 2 mm. For connections between a standard KF metal flange and a glass flange, a 3 mm wide seal is used.

The total width of two flanges and one seal is always 10 mm:

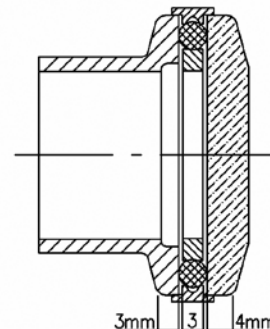
- $4+2+4=10$ for glass to glass connections
- $4+3+3=10$ for glass to metal connections
- $3+4+3=10$ for metal to metal connections



Glass to glass connection



Glass to metal connection



KF flange with glass blank flange

TEFLON BELLOWS

Properties

- Flanges: Teflon GRP* / Bellows: Teflon
- Temperature range: -50 ... +200°C
- Leak rate: $< 1.10^{-6}$ mbar.l.s⁻¹

Advantages

- High flexibility
- Excellent corrosion resistance
- Suitable for glass and metal systems
- GRP* reinforced flanges
- Machined from one piece
- Electrical insulation
- Antimagnetic

Applications

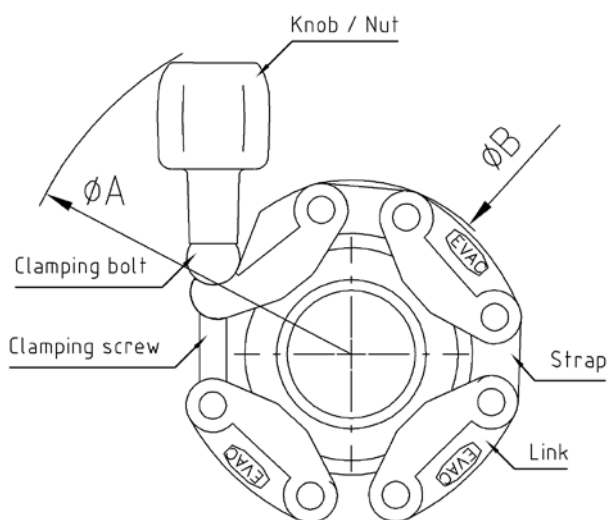
- Compensation of axial, lateral or angular set-offs
- Prevention of vibration transfer
- Substitute for elastomer compensators
- Compensate thermal expansion

* Glass-Reinforced Plastic (also called fiberglass)

KF Chain Clamps for Glass Components DN 10/16-63

APPLICATIONS

- Moderate overpressure (up to 2 bar)
- Heated use (up to 200°C High & U-High temp. versions)
- Use of elastomer seals with special carriers
- Easy tightening by hand
- Vacuum down to 10^{-9} mbar
- For ultra clean applications



DN	A	B
10/16	122	60
20/25	127	70
32/40	141	85
50	156	105
63	170	120

Dimensions in mm.

	DN	STANDARD	HIGH-TEMPERATURE	STANDARD WITH TORQUE LIMITATION	HIGH-TEMP. WITH TORQUE LIMITATION	PLASTIC ULTRA-HIGH-TEMPERATURE
		P/N				
	10 / 16	30.016010.131.816	30.016012.131.916	30.016010.132.816	30.016012.132.916	30.016094.100.000
	20 / 25	30.025010.131.825	30.025012.131.925	30.025010.132.825	30.025012.132.925	30.025094.100.000
	32 / 40	30.040010.131.840	30.040012.131.940	30.040010.132.840	30.040012.132.940	30.040094.100.000
	50	30.050010.131.850	30.050012.131.950	30.050010.132.850	30.050012.132.950	30.050094.100.000
	63	30.063010.131.863	30.063012.131.963	30.063010.132.863	30.063012.132.963	30.063094.100.000
MATERIALS	Links	Composite white	Composite grey	Composite white	Composite grey	Composite
	Straps	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
	Knob	Composite	Composite	Composite	Composite	Composite
	Bolt M5	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
	Clamping piece	Composite	Composite	Composite	Composite	Composite
	Tightening	By hand	By hand	By hand	By hand	By hand
RANGE OF APPLICATIONS	Vacuum	Rough / High	Rough / High	Rough / High	Rough / High	Rough / High
	Temperature range	-20...60°C (80°C, 5h)	-20...100°C (150°C, 12h)	-20...60°C (80°C, 5h)	-20...100°C (80°C, 5h)	-20...200°C
	Cryogenics	-	-	-	-	-
	Pressure	2 bar	2 bar	2 bar	2 bar	2 bar
	Pressure DN 63	1.5 bar	1.5 bar	1.5 bar	1.5 bar	1.5 bar
	Antimagnetic	Yes	Yes	Yes	Yes	Yes
	Radiation resistant	-	-	-	-	-
	Chemistry / Corrosion	Yes	Yes	Yes	Yes	Yes
	Cleanroom suitable	Yes	Yes	Yes	Yes	Yes
	Electrical isolation	Yes	Yes	Yes	Yes	Yes
Seals	Elastomer	Elastomer	Elastomer	Elastomer	Elastomer	

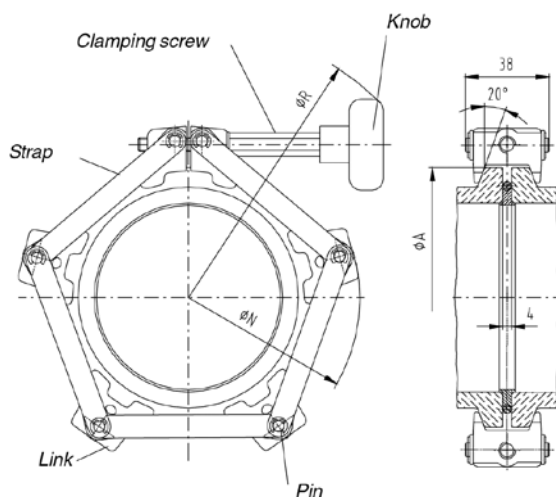
The tightening stop prevents an overtightening of the chain clamp protecting the glass flanges.

ISO Chain Clamps for Glass Components DN 80-160

APPLICATIONS

- No damage of glass flanges
- Links with two pressure points (patented)
- Load on GRP* links only upon pressure
- Minimum space required

*GRP: glass-fiber reinforced plastic



DN	A	N	R
80	114	154	244
100	134	172	256
125	161	200	278
160	190	220	360

Dimensions in mm.

	DN	PLASTIC / STAINLESS STEEL	PLASTIC HIGH TEMPERATURE
		P/N	
	80	30.080010.221.808	30.080012.221.908
	100	30.100010.221.810	30.100012.221.910
	125	30.125010.221.812	30.125012.221.912
	160	30.160010.221.816	30.160012.221.916
Materials	Links	GRP* black	GRP* grey
	Straps	Stainless Steel	Stainless Steel
	Knob	GRP*	GRP*
	Clamping screw	Stainless Steel M6	Stainless Steel M6
	Tightening	By hand	By hand
Range of Application	Vacuum	Rough- / High- / UHV	Rough- / High- / UHV
	Temperature range	-20...60°C (80°C, 5h)	-20...100°C (150°C, 12h)
	Cryogenics	-	-
	Pressure	-	-
	Antimagnetic	Yes	Yes
	Radiation resistant	-	-
	Chemistry / Corrosion	Yes	Yes
	Cleanroom suitable	Yes	Yes
	Electrical isolation	Yes	Yes
Seals	Elastomer only	Elastomer only	

*GRP: glass-fiber reinforced plastic

The chain clamps can be sterilized with hot water.

KF Elastomer Seals for Glass Components DN 10/16-63

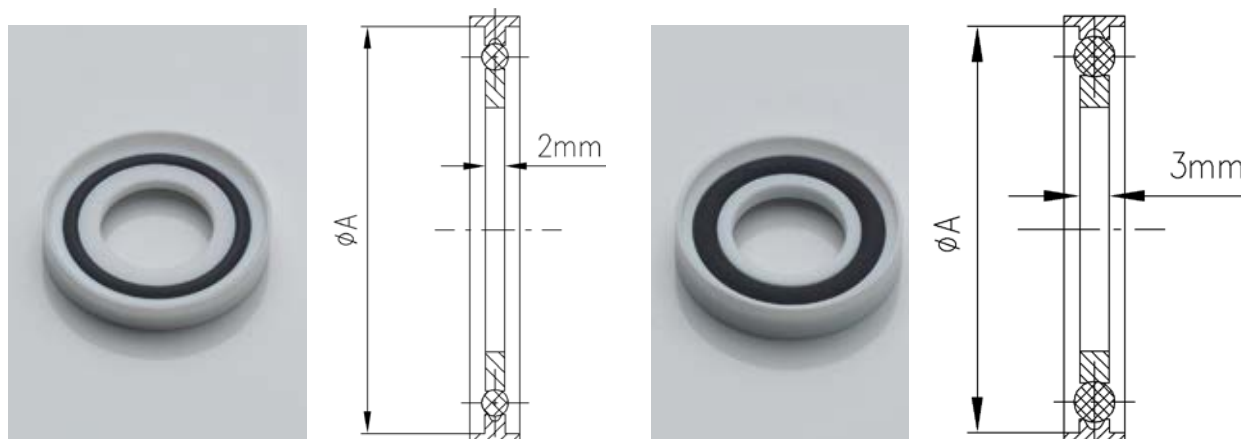
APPLICATIONS

- For 4 mm glass systems flange (2 mm width) and for 4 mm glass to 3 mm metal flange transition (3 mm width)
- For pressure applications up to 2 bar
- For ultra-high vacuum applications (10^{-9} mbar)
- For ultra-pure applications in combination with quartz flanges
- Temperature range for Viton up to 200°C
- Teflon carrier and outer center ring
- FEP* for low temperatures down to -50°C

*FEP: Silicone O-ring seamlessly coated with Teflon

DN	A
10/16	30
20/25	40
32/40	55
50	75
63	87

Dimensions in mm.



DN	TEFLON / VITON	TEFLON / FEP	TEFLON / VITON	TEFLON / FEP
Application	Glass / Glass connection		Glass / Metal connection	
	P/N			
Compr. seal width	2 mm		3 mm	
10 / 16	34.016035.122.616	34.016031.122.216	34.016035.123.616	34.016031.123.216
20 / 25	34.025035.122.625	34.025031.122.225	34.025035.123.625	34.025031.123.225
32 / 40	34.040035.122.640	34.040031.122.240	34.040035.123.640	34.040031.123.240
50	34.050035.122.650	34.050031.122.250	34.050035.123.650	34.050031.123.250
63	34.063035.122.663	34.063031.122.263	34.063035.123.663	34.063031.123.263
MATERIALS	Inner ring	Teflon	Teflon	Teflon
	O-ring	Viton	FEP*	Viton
	Outer ring	Teflon	Teflon	Teflon
RANGE OF APPLICATIONS	Vacuum	Rough / High	Rough / High	Rough / High
	Temperature range	-20...200°C	-50...200°C	-20...200°C
	Cryogenics	-	-	-
	Pressure	2 bar	2 bar	2 bar
	Pressure DN 63	1.5 bar	1.5 bar	1.5 bar
	Antimagnetic	Yes	Yes	Yes
	Radiation resistant	-	-	-
	Chemistry / Corrosion	Yes	Excellent	Yes
	Cleanroom suitable	Yes	Yes	Yes
Electrical isolation	Yes	Yes	Yes	

*FEP: Silicone O-ring seamlessly coated with Teflon

ISO Elastomer Seals for Glass Components DN 80-160

ELASTOMER SEAL, OUTER CENTER RING



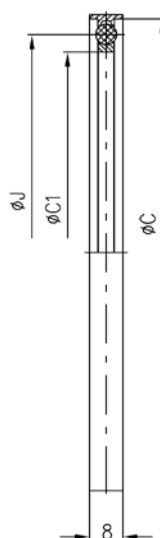
APPLICATIONS

- Only for 4mm glass system flanges
- For pressure applications up to 2 bar
- For ultra-high vacuum applications (10^{-9} mbar)
- For ultra-pure applications in combination with quartz flanges
- Temperature range for Viton up to 200°C
- Teflon carrier and outer center ring
- FEP* for low temperatures down to -50°C

*FEP: Silicone O-ring seamlessly coated with Teflon

DN	C	C1	J
80	114	83	92
100	134	102	114
125	161	127	139
160	190	153	162

Dimensions in mm.



	DN	TEFLON / VITON	TEFLON / FEP
		P/N	
	80	34.080035.212.508	34.080031.212.208
	100	34.100035.212.510	34.100031.212.210
	125	34.125035.212.512	34.125031.212.212
	160	34.160035.212.516	34.160031.212.216
MATERIALS	Inner ring	Teflon	Teflon
	O-ring	Viton	FEP*
	Outer ring	Teflon	Teflon
RANGE OF APPLICATIONS	Vacuum	Rough/High	Rough/High
	Temperature range	-20...200°C	-50...200°C
	Cryogenics	-	-
	Pressure	-	-
	Leak rate (mbar.l.s ⁻¹)	<1.10 ⁻⁹	<1.10 ⁻⁶
	Antimagnetic	Yes	Yes
	Radiation resistant	-	-
	Chemistry/Corrosion	Limited	Yes
	Cleanroom suitable	Yes	Yes
	Electrical isolation	Yes	Yes

*FEP = Silicone O-ring seamlessly coated with Teflon

ELASTOMER SEALS, INNER CENTER RING

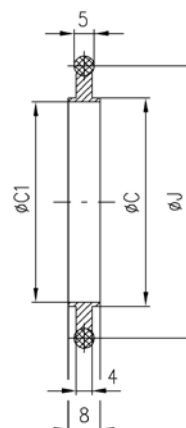


APPLICATIONS

- ISO glass system flanges
- For ultra-high vacuum applications (10⁻⁹ mbar)
- For ultra-pure applications in combination with quartz flanges
- Temperature range for Viton up to 200°C
- Teflon inner center ring
- FEP for low temperatures down to -50°C

DN	C	C1	J
80	83	81	98
100	102	100	118
125	127	125	144
160	153	151	167

Dimensions in mm.



	DN	TEFLON / VITON	TEFLON / FEP
		P/N	
	80	34.080035.211.508	34.080031.211.208
	100	34.100035.211.510	34.100031.211.210
	125	34.125035.211.512	34.125031.211.212
	160	34.160035.211.516	34.160031.211.216
MATERIALS	Inner ring	Teflon	Teflon
	O-ring	Viton	FEP*
	Outer ring	-	-
RANGE OF APPLICATIONS	Vacuum	Rough / High	Rough / High
	Temperature range	-20...200°C	-50...200°C
	Cryogenics	-	-
	Pressure	-	-
	Leak rate (mbar.l.s⁻¹)	<1.10 ⁻⁹	<1.10 ⁻⁶
	Antimagnetic	Yes	Yes
	Radiation resistant	-	-
	Chemistry / Corrosion	Limited	Yes
	Cleanroom suitable	Yes	Yes
Electrical isolation	Yes	Yes	

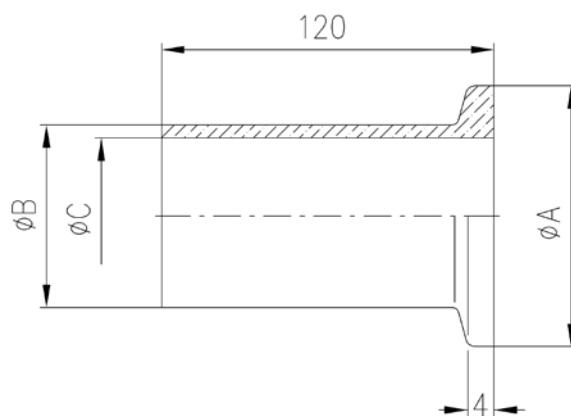
*FEP: Silicone O-ring seamlessly coated with Teflon

KF/ISO-Tapered Glass & Quartz Components DN 10-63, 80-160

APPLICATIONS

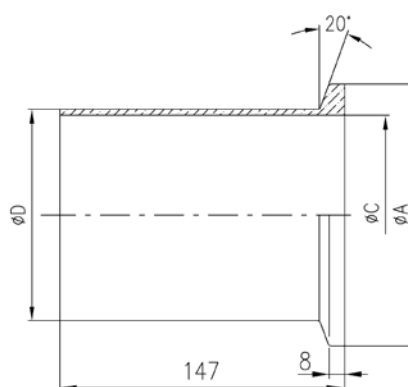
- Inspectable flanges for process control, plasma and oven
- Insertion of (UV) laser light into reaction tube (quartz flange)
- UV protection with Duran flanges / windows
- Quartz for lowest UV absorption
- Vacuum down to 10^{-9} mbar
- Temp. range of quartz up to 1000°C / Duran up to 450°C
- Pressure up to 2 bar (DN 10...50) / 1.5 bar (DN 63)
- Antimagnetic and radiation resistant
- Excellent chemistry / corrosion
- Cleanroom suitable and electrical isolation
- For ultra-pure processes as ion implanters etc. (quartz)

KF FLANGES



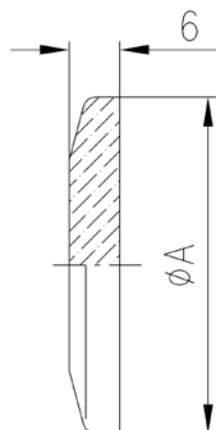
DN	A	B		C		P/N	
		Duran	Quartz	Duran	Quartz	Duran	Quartz
10	30	16	16	12.4	13	32.010007.113.710	32.010008.113.810
16	30	20	20	16.4	17	32.016007.113.716	32.016008.113.816
25	40	30	30	26	27	32.025007.113.725	32.025008.113.825
40	55	46	46	41.4	42	32.040007.113.740	32.040008.113.840
50	75	56	57	51	52	32.050007.113.750	32.050008.113.850
63	87	75	75	70.6	70.6	32.063007.113.763	32.063008.113.863

ISO-TAPERED FLANGES (20° angle)



DN	A	C	D	P/N	
				Duran	Quartz
80	114	83	89	32.080007.213.708	32.080008.213.808
100	134	102	110	32.100007.213.710	32.100008.213.810
125	161	127	135	32.125007.213.712	32.125008.213.812
160	190	153	160	32.160007.213.716	32.160008.213.816

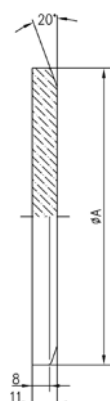
KF BLANK FLANGES



All dimensions are in mm.

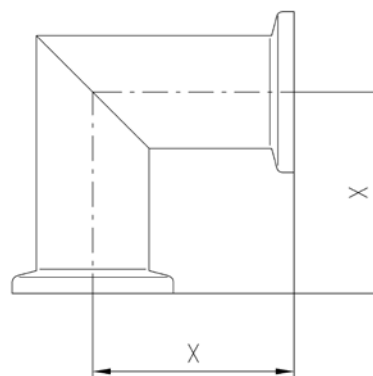
DN	A	P/N			
		Duran standard	Quartz standard	Duran optical	Quartz optical
10/16	30	32.016007.123.716	32.016008.123.816	32.016007.125.716	32.016008.125.816
25	40	32.025007.123.725	32.025008.123.825	32.025007.125.725	32.025008.125.825
40	55	32.040007.123.740	32.040008.123.840	32.040007.125.740	32.040008.125.840
50	75	32.050007.123.750	32.050008.123.850	32.050007.125.750	32.050008.125.850
63	87	32.063007.123.763	32.063008.123.863	32.063007.125.763	32.063008.125.863

ISO-TAPERED BLANK FLANGES (20° angle)



DN	A	P/N			
		Duran standard	Quartz standard	Duran optical	Quartz optical
80	114	32.080007.223.708	32.080008.223.808	32.080007.224.708	32.080008.224.808
100	134	32.100007.223.710	32.100008.223.810	32.100007.224.710	32.100008.224.810
125	161	32.125007.223.712	32.125008.223.812	32.125007.224.712	32.125008.224.812
160	190	32.160007.223.716	32.160008.223.816	32.160007.224.716	32.160008.224.816

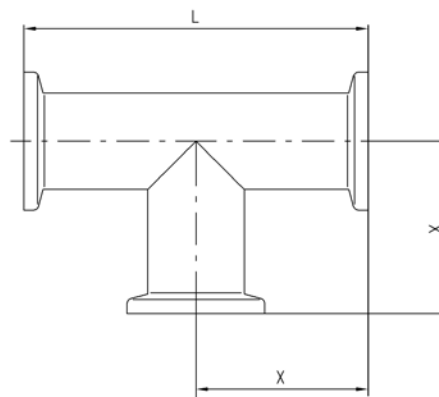
KF & ISO-TAPERED ELBOWS



All dimensions are in mm.

	DN	X	P/N	
			Duran	Quartz
KF	10	40	33.010007.151.710	33.010008.151.810
	16	40	33.016007.151.716	33.016008.151.816
	25	50	33.025007.151.725	33.025008.151.825
	40	65	33.040007.151.740	33.040008.151.840
	50	70	33.050007.151.750	33.050008.151.850
	63	75	33.063007.151.763	33.063008.151.863
ISO-TAPERED	80	98	33.080007.251.708	33.080008.251.808
	100	108	33.100007.251.710	33.100008.251.810
	125	118	33.125007.251.712	33.125008.251.812
	160	138	33.160007.251.716	33.160008.251.816

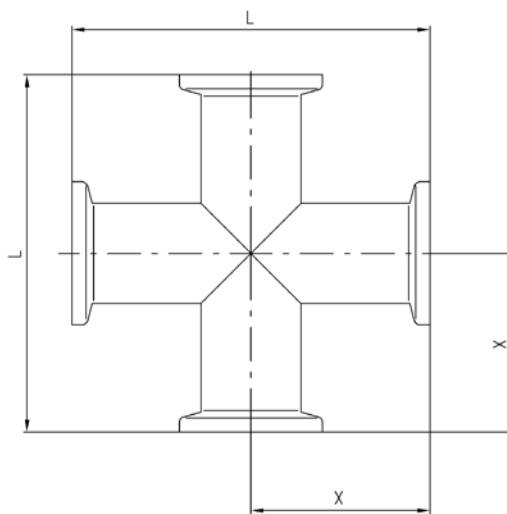
KF & ISO-TAPERED TEES



	DN	X	L	P/N	
				Duran	Quartz
KF	10	40	80	33.010007.161.710	33.010008.161.810
	16	40	80	33.016007.161.716	33.016008.161.816
	25	50	100	33.025007.161.725	33.025008.161.825
	40	65	130	33.040007.161.740	33.040008.161.840
	50	70	140	33.050007.161.750	33.050008.161.850
	63	75	150	33.063007.161.763	33.063008.161.863
ISO-TAPERED	80	98	196	33.080007.261.708	33.080008.261.808
	100	108	216	33.100007.261.710	33.100008.261.810
	125	118	236	33.125007.261.712	33.125008.261.812
	160	138	276	33.160007.261.716	33.160008.261.816

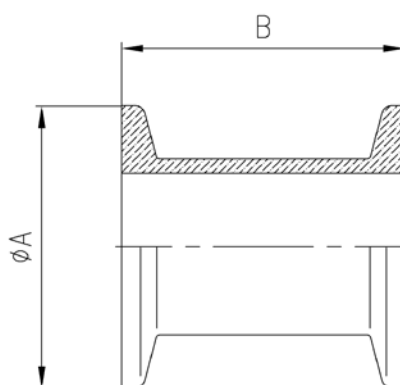
All dimensions are in mm.

KF & ISO-TAPERED CROSSES



	DN	X	L	P/N	
				Duran	Quartz
KF	10	40	80	33.010007.171.710	33.010008.171.810
	16	40	80	33.016007.171.716	33.016008.171.816
	25	50	100	33.025007.171.725	33.025008.171.825
	40	65	130	33.040007.171.740	33.040008.171.840
	50	70	140	33.050007.171.750	33.050008.171.850
	63	75	150	33.063007.171.763	33.063008.171.863
ISO-TAPERED	80	98	196	33.080007.271.708	33.080008.271.808
	100	108	216	33.100007.271.710	33.100008.271.810
	125	118	236	33.125007.271.712	33.125008.271.812
	160	138	276	33.160007.271.716	33.160008.271.816

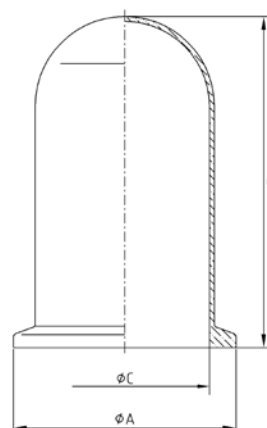
KF & ISO-TAPERED ADAPTORS



All dimensions are in mm.

	DN	A	B	P/N	
				Duran	Quartz
KF	10	30	120	33.010007.141.710	33.010008.141.810
	16	30	120	33.016007.141.716	33.016008.141.816
	25	40	120	33.025007.141.725	33.025008.141.825
	40	55	120	33.040007.141.740	33.040008.141.840
	50	75	120	33.050007.141.750	33.050008.141.850
	63	120	120	33.063007.141.763	33.063008.141.863
ISO-TAPERED	80	114	196	33.080007.222.708	33.080008.222.808
	100	134	216	33.100007.222.710	33.100008.222.810
	125	161	236	33.125007.222.712	33.125008.222.812
	160	190	276	33.160007.222.716	33.160008.222.816

KF & ISO-TAPERED JARS



	DN	A	C	L	P/N	
					Duran	Quartz
KF	10	30	12	120	33.010007.11A.710	33.010008.11A.810
	16	30	16	120	33.016007.11A.716	33.016008.11A.816
	25	40	26	120	33.025007.11A.725	33.025008.11A.825
	40	55	42	120	33.040007.11A.740	33.040008.11A.840
	50	75	52	120	33.050007.11A.750	33.050008.11A.850
	63	87	70	120	33.063007.11A.763	33.063008.11A.863
ISO-TAPERED	80	114	83	200	33.080007.21A.708	33.080008.21A.808
	100	134	102	200	33.100007.21A.710	33.100008.21A.810
	125	161	127	200	33.125007.21A.712	33.125008.21A.812
	160	190	153	200	33.160007.21A.716	33.160008.21A.816

All dimensions are in mm.

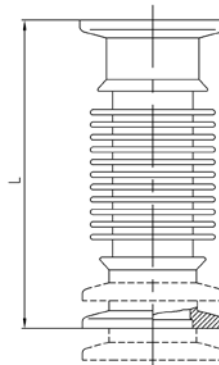
KF Teflon Bellows DN 10/16-63



APPLICATIONS

- Ultra-high vacuum (10^{-9} mbar)
- Excellent corrosion resistance
- GRP* reinforced flanges
- Excellent electric insulation
- Antimagnetic
- Very good radiation tolerance
- Only with elastomer seals

DN	L	AXIAL TRAVEL [+/-mm]	LATERAL TRAVEL [+/-mm]	MAX. ANGLE [+/-°]	P/N
10	70	6	5	20	35.010087.101.610
16	70	7	6	25	35.016087.101.616
25	80	10	6	25	35.025087.102.625
40	100	20	8	30	35.040087.103.650
50	100	18	8	30	35.050087.103.650
63	100	17	8	30	35.063087.103.663



*GRP: Glass-fiber Reinforced Plastic

MOQ: 10 pieces

All dimensions are in mm.

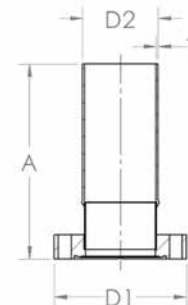
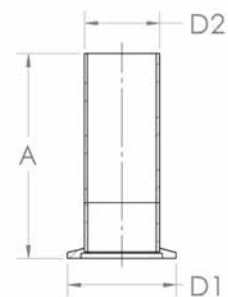
KF, ISO K, CF Glass to Metal Adaptors

All components of this paragraph are available in **Kodial**, **Pyrex** (with P last digit on P/N) or **Quartz** (with Q last digit on P/N).

Specifications: Bakeable to 200°C at not greater than 2-3°C/min.

TUBULATIONS - GLASS/STAINLESS STEEL

FLANGE	P/N	DN	GLASS	A	D1	D2
KF	KF16T13	16	Kodial	100	30	13
	KF25T19	25	Kodial	100	40	19
	KF25T25	25	Kodial	100	40	25
	KF40T25	40	Kodial	100	55	25
	KF40T38	40	Kodial	100	55	38
ISO K	ISO63T19	63	Kodial	100	95	19
	ISO63T38	63	Kodial	100	95	38
	ISO63T64*	63	Kodial	100	95	64
	ISO100T38	100	Kodial	100	130	38
	ISO100T64*	100	Kodial	100	130	64
	ISO100T100*	100	Kodial	150	130	100
	ISO160T64*	160	Kodial	100	180	64
	ISO160T100*	160	Kodial	150	180	100
	ISO160T150*	160	Kodial	150	180	150
CF	T6	16	Kodial	100	34	6
	T13	16	Kodial	100	34	13
	T19	40	Kodial	100	70	19
	T25	40	Kodial	100	70	25
	T38	40	Kodial	100	70	38
	T64*	63*	Kodial	100	114	64



*Available only in Kodial or Pyrex

NOTE: Dimensions subject to raw material supplier tolerances.

All dimensions are in mm.

These connections are also available in double ended tubulations. Length on request.



KF double ended tubulation



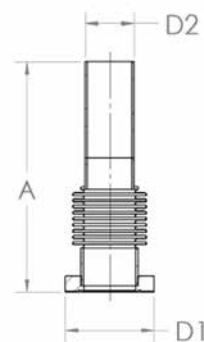
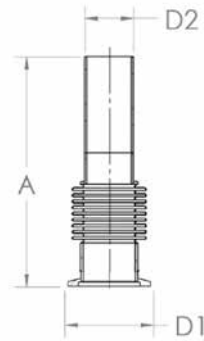
CF double ended tubulation

TUBULATIONS WITH HYDROFORMED BELLOWS - GLASS / STAINLESS STEEL

FLANGE	P/N	DN	GLASS	A	D1	D2
KF	KF16T13B	16	Kodial	170	30	13
	KF25T19B	25	Kodial	190	40	19
	KF25T25B	25	Kodial	200	40	25
	KF40T25B	40	Kodial	200	55	25
	KF40T38B	40	Kodial	200	55	38
ISO K	ISO63T19B	63	Kodial	190	95	19
	ISO63T38B	63	Kodial	200	95	38
	ISO63T64B*	63	Kodial	260	95	64
	ISO100T38B	100	Kodial	200	130	38
	ISO100T64B*	100	Kodial	260	130	64
	ISO100T100B*	100	Kodial	280	130	100
CF	TB6	16	Kodial	170	34	6
	TB13	16	Kodial	170	34	13
	TB19	40	Kodial	190	70	19
	TB25	40	Kodial	200	70	25
	TB38	40	Kodial	200	70	38
	TB64*	63	Kodial	260	114	64

*Available only in Kodial or Pyrex

NOTE: Dimensions subject to raw material supplier tolerances.



All dimensions are in mm.

These connections are also available in double ended tubulations. Length on request.



KF double ended tubulation with bellows



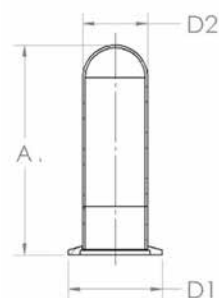
CF double ended tubulation with bellows

DOMED TUBULATIONS - GLASS / STAINLESS STEEL

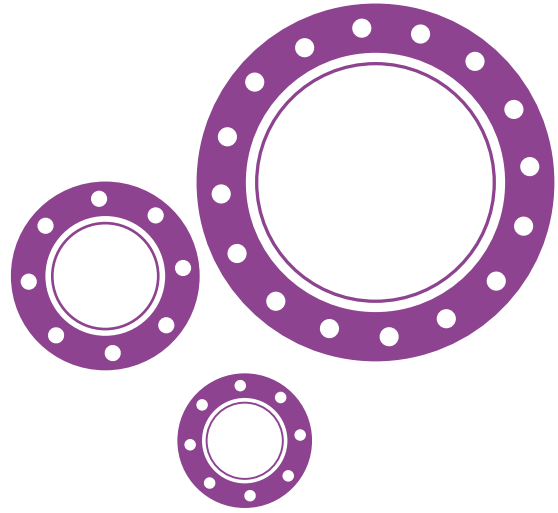
FLANGE	P/N	DN	A	D1	D2
KF	KF16DT13	16	100	30	13
	KF25DT25	25	100	40	25
	KF40DT38	40	100	55	38
ISO K	ISO63DT64*	63	150	95	64
	ISO100DT100*	100	150	130	100
	ISO160DT150*	160	200	180	150
CF	T13DT	16	100	34	13
	T38DT	40	100	70	38
	T64DT*	63	150	114	64

*Available only in Kodial or Pyrex

NOTE: Dimensions subject to raw material supplier tolerances.



All dimensions are in mm.



VACUUM VIEWPORTS

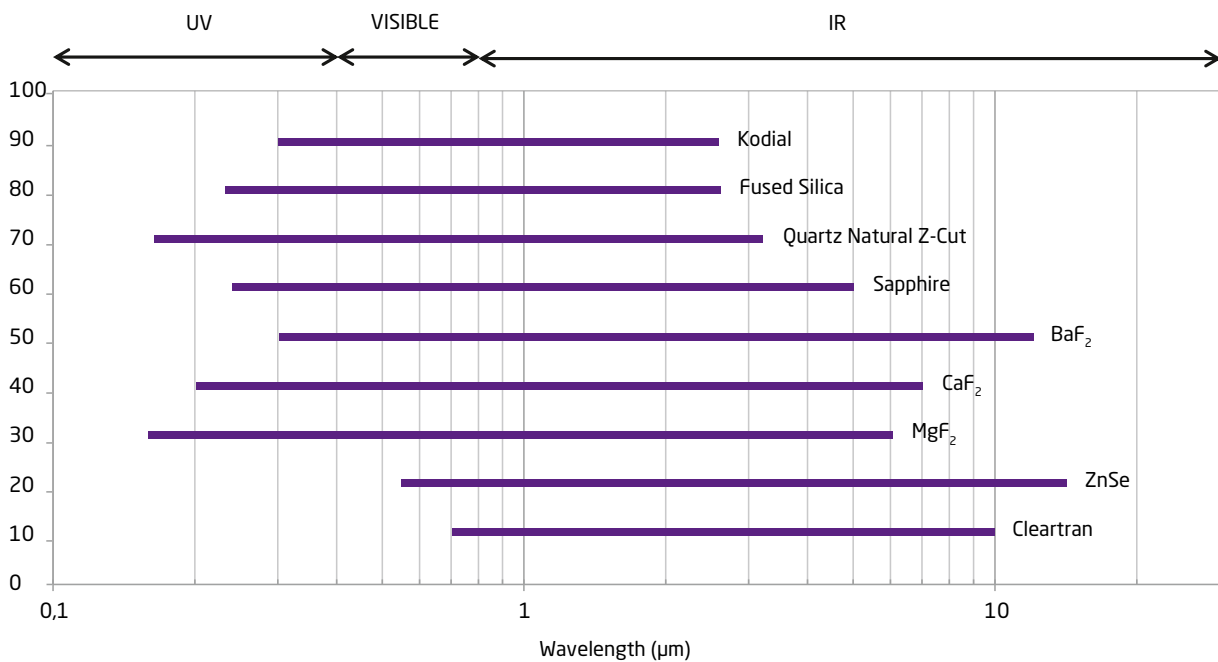
- Introduction I 03
- KF, ISO & CF Viewports I 09
- CF Viewport Shutters and Quick Access Doors I 16
- Differentially Pumped Viewports I 18

Neyco manufactures a range of UHV viewports in CF, ISO or KF flange styles including a variety of coatings to enhance performance.

Materials include:

- Kodial (borosilicate glass)
- Fused Silica
- Quartz natural
- Sapphire
- Barium Fluoride BaF_2
- Calcium Fluoride CaF_2
- Magnesium Fluoride MgF_2
- Zinc Selenide ZnSe
- Zinc Sulfide Cleartran

Viewports are manufactured in cleanroom conditions and Helium leak tested, cleaned and packed to UHV standards.



Comparison of some viewports materials transmission spectra

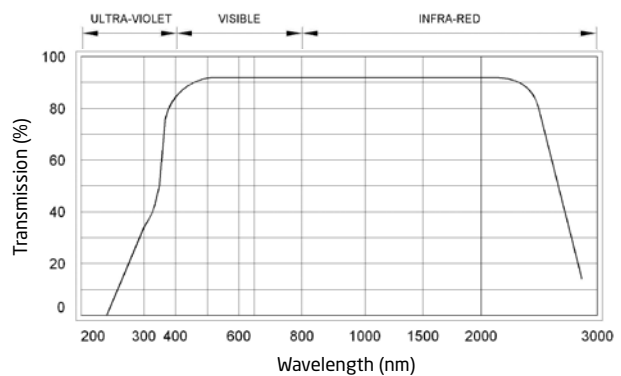
Introduction

VIEWPORTS MATERIALS

KODIAL

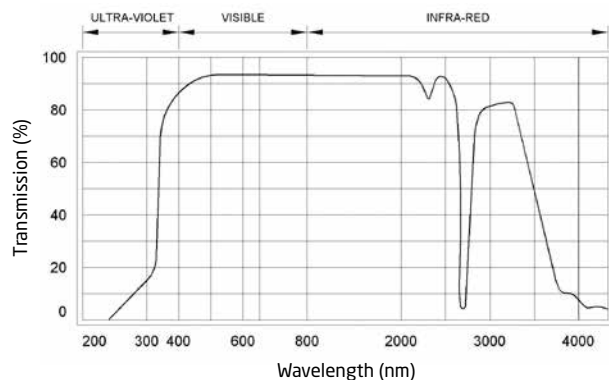
The viewports comprise a Borosilicate glass optic which is sealed to a Kovar weld ring using an induction heater process.

The optic assemblies are TIG welded to flanges. The rugged construction of the Kodial viewports allows repeated bakeout with UHV performance.



QUARTZ FUSED SILICA

The viewports comprise a high purity laser quality fused silica optic with precise flatness, parallelism, scratch and dig specifications.

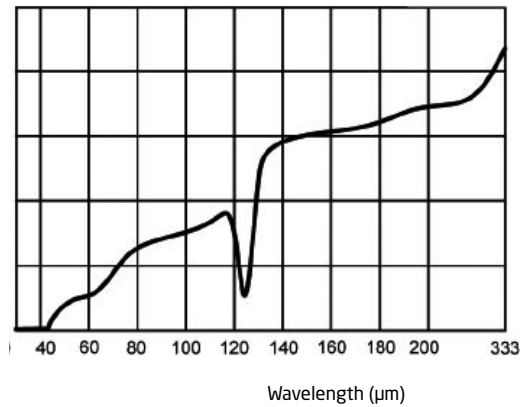
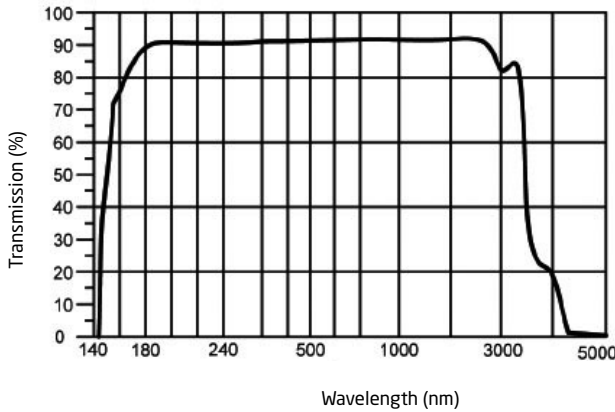


QUARTZ NATURAL Z-CUT

The viewports comprise a high quality natural quartz optic with precise flatness, parallelism, scratch and dig specifications.

One of the best materials for transmission of wavelengths above 50 μm is z-cut crystal quartz, so z-cut quartz windows are popular as THz* windows. It is important that z-cut

crystal quartz windows are also transparent in the visible spectrum allowing easy adjustment with a HeNe laser and do not change the state of light polarization. Z-cut quartz also has excellent transparency in the vacuum UV portion of the spectrum and is therefore a popular window material for use in UV spectroscopy and UV lithography.

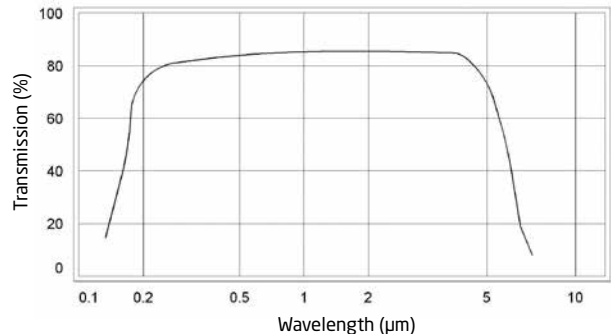


*THz: Terahertz radiation is located in the spectral region ~ 3 mm - 30 μm (~ 0.1-10 THz)

SAPPHIRE

The viewports comprise a high quality optic with precise flatness, parallelism, scratch and dig specifications.

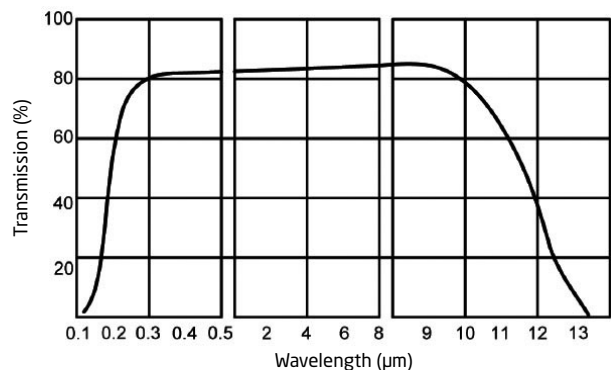
The single crystal sapphire windows have excellent optical, physical and chemical properties. The hardest of the oxide crystals, sapphire retains its high strength at high temperatures. Sapphire has a low coefficient of thermal expansion and low fluorescence, good resistance to thermal shock and scratching making this an excellent material for IR transmitting optics and robust applications. C-cut sapphire is selected to minimise the effects of birefringence.



BARIUM FLUORIDE BaF₂

Barium Fluoride is used for windows, lenses and prisms, particularly when transmission into the ultraviolet is desired. Barium Fluoride is suitable for applications in the IR band (8 to 12 μm) and is often used as a IR viewport window for thermography.

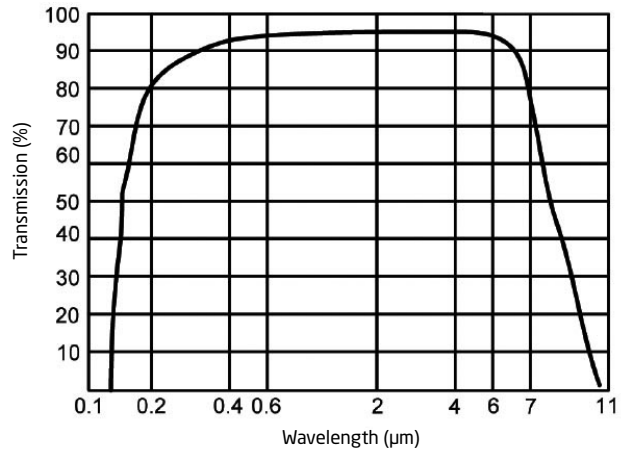
Barium Fluoride is less resistant to attack by water than Calcium Fluoride. Barium Fluoride is the most resistant fluoride to high energy radiation but does not have VUV transmission of other types. The material is relatively hard but is very sensitive to thermal shock.



CALCIUM FLUORIDE CaF₂

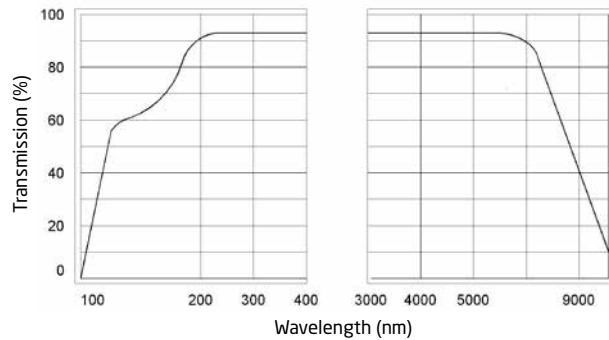
Best transmission by Fluoride crystals in the UV (except very weak LiF). Mechanically only slightly weaker than Zinc Selenide and slightly harder. Single crystal material with cubic symmetry, hence no birefringence. Calcium Fluoride is transparent in the visible (appears similar in color to quartz or glass) and in the UV down to 120 nm, which services all excimer laser applications. Low index of refraction, which means that the windows rarely require antireflective coatings.

The rugged, bonded construction of the CaF₂ viewports allows bake-out to a maximum of 120°C with UHV performance.



MAGNESIUM FLUORIDE MgF₂

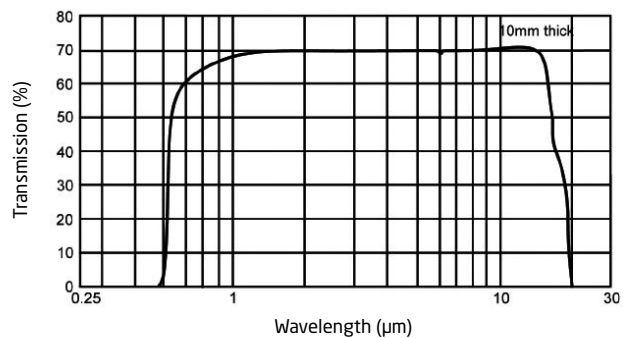
Next best transmission of fluorides compared to CaF₂ and similar in all other characteristics with the following exceptions. MgF₂ is stronger and harder and is naturally, strongly birefringent



ZINC SELENIDE ZnSe

The viewports comprise a laser quality Zinc Selenide optic with precise flatness, parallelism, scratch and dig specifications.

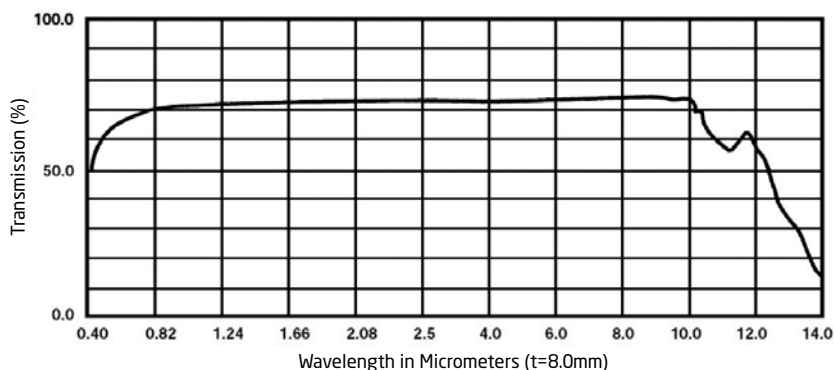
Best transmission available at 10.6 μm (CO₂ laser fundamental line) and in the visible. It has some absorption in the blue-green causing it to appear yellow. The index of refraction is high and thus requires anti-reflection coatings on both sides for optimum performance. This polycrystalline, CVD grown material is strong, though relatively soft compared to other crystalline, optical materials. It is non-hygroscopic. ZnSe sublimates at 300°C and reacts violently with strong mineral acids.



ZINC SULFIDE CLEARTRAN

Comparable to ZnSe in most respects, only slightly more absorbing at 10.6 μm. Advantage is the transmission in the visible is better, no absorption to only slight absorption in the bluegreen thus appearing clear (i.e. not yellow). It is much harder than ZnSe and thus resists scratching much better.

Cleartran is a form of CVD Zinc Sulfide that is modified by a post-deposition hot isostatic process. This process removes Zinc hydrides from the crystal lattice, normalizes crystal structure and purifies the material, all contributing to single crystal-like transmittance in the visible through far infrared ranges (0.35-14 μm).



Please note that the optical transmission curves are approximations and should be used for reference only.

FLANGE AND WELD RING MATERIALS

The UHV CF versions are offered using high grade Stainless Steel 304L or 316LN flanges.

Flanges in Stainless Steel 316L are used for the high vacuum KF and ISO viewports.

FLANGE TYPE	GLASS TYPE	WELD RING MATERIAL	
		MAGNETIC	NON MAGNETIC
CF 304L KF 316L ISO 316L	Kodial Quartz Sapphire ZnSe	Kovar	-
	CaF ₂ BaF ₂ MgF ₂	316L	-
CF 316LN	Kodial Quartz Sapphire ZnSe	Kovar	Tantalum
	CaF ₂ BaF ₂ MgF ₂	-	316L

TECHNICAL SPECIFICATIONS

	KODIAL	FUSED SILICA	SAPPHIRE	QUARTZ NATURAL Z-CUT	ZnSe	BaF ₂	CaF ₂	MgF ₂
Seal type	Braze Bond Mechanically sealed	Braze Mechanically sealed		Braze Bond Mechanically sealed	Bond Mechanically sealed			
Maximum temperature	120°C ⁽¹⁾ 130°C ⁽²⁾ 150°C (KF & ISO) ⁽³⁾ 350°C (CF) ⁽³⁾	150°C (KF & ISO) 200°C (CF)	150°C (KF & ISO) 450°C (CF)	120°C ⁽²⁾ 150°C (KF & ISO) ⁽³⁾ 200°C (CF) ⁽³⁾	120°C ⁽²⁾ 130°C ⁽¹⁾			
Minimum temperature	-20°C							
Maximum rate of temperature change	3°C / min							
Leak rate	< 1.10 ⁻¹⁰ mbar.l.sec ⁻¹ (He)							
Pressure range	1 bar to 1.10 ⁻¹¹ mbar ⁽⁴⁾							
Surface quality (scratch / dig)	20/10	20/10	60/40	20/10	60/40			
Parallelism	-	< 3 arc minutes			-	-	-	-
Flatness	λ/4 ⁽¹⁾⁽²⁾ , < 8λ ⁽³⁾	< 8λ	< 8λ	λ/4 ⁽²⁾ , < 8λ ⁽³⁾	< 2λ	λ/4		

(1) For mechanically sealed viewport

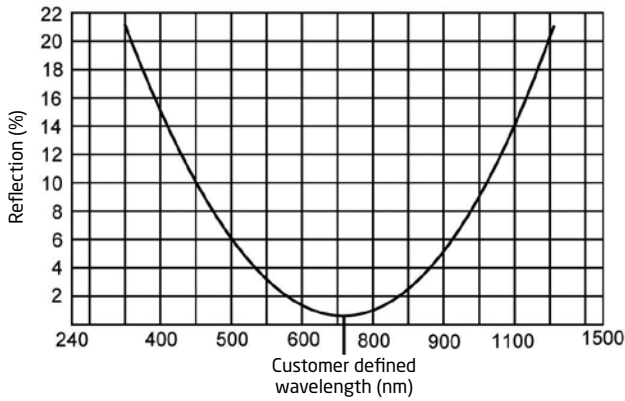
(2) For bonded viewport

(3) For brazed viewport

(4) 1.10⁻⁸ mbar for mechanically sealed viewport

ANTI-REFLECTIVE COATINGS

A range of anti-reflective coatings can be processed and optimised to customer specified wavelengths. Theoretical reflectance curves can be supplied on request for particular window material and wavelength combinations. The coatings are processed on eBeam system in cleanroom conditions and tested on a state of the art UV-Vis spectrophotometer.



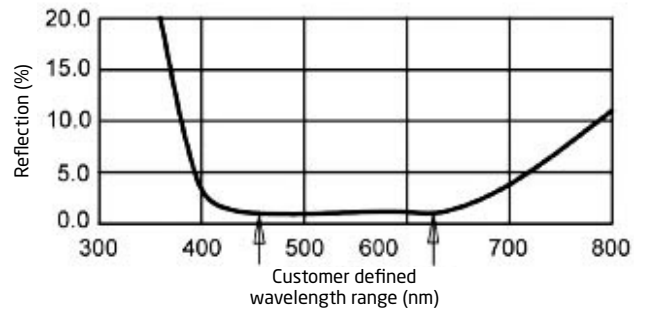
Reflectance curve with BBAR anti-reflective coating

Viewports are offered with :

- a **single QWOT*** MgF₂ layer anti-reflective (AR) coating on both sides of the window optimised to a customer specified wavelength range (standard wavelengths between 190 nm and 1550 nm).
- a **two-layer VAR** or a **four-layer broadband BBAR** anti-reflective coating on both sides of the window optimised to a customer specified wavelength. In many cases, the coating reduces reflection to below 0.5% per face or 1% total at the wavelength specified (standard wavelengths between 240 nm and 1550 nm).

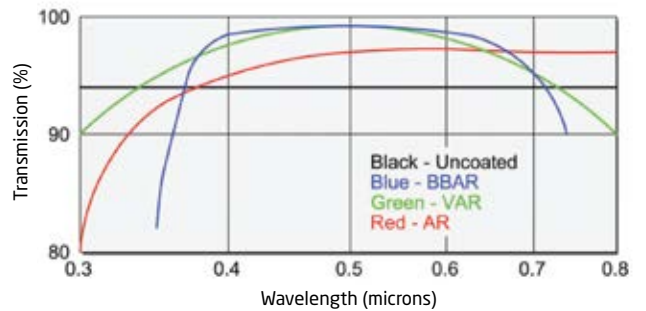
Coatings for other wavelengths can be quoted also on request.

*QWOT = Quarterwave optical thickness



Reflectance curve with VAR anti-reflective coating

The graph below shows typical before and after transmission effect of AR, VAR, and BBAR anti-reflective coatings on Kodial viewports.



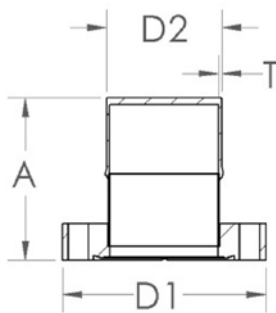
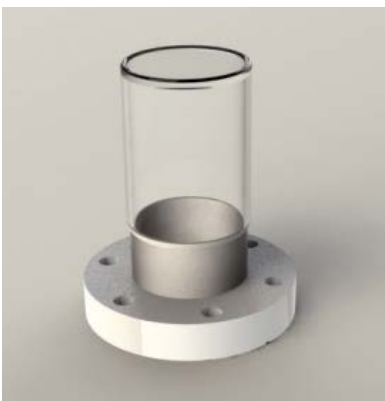
Please note that the optical transmission curves are approximations and should be used for reference only.

THIN FILM COATINGS

Neyco also coats viewports with transparent conductive coatings such as ITO (Indium Tin Oxide) on the vacuum side of the window to provide surface conductivity either to eliminate electrostatic charge build up or to improve EMC/RFI screening.

KF, ISO & CF Viewports

TUBULATED VIEWPORTS



DIMENSIONS FOR CF FLANGES

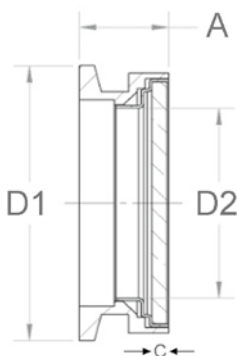
P/N		DN	A	D1	D2	T
KODIAL	FUSED SILICA					
VP13	VP13Q	16	30	34	13	1.0
VP19	VP16Q	35	30	70	19	1.5
VP63	-	63	70	114	64	2.0

Note: Dimensions subject to raw material supplier tolerances.

These viewports are also available with KF and ISO flanges on request.

All dimensions are in mm.

KF ZERO LENGTH VIEWPORTS



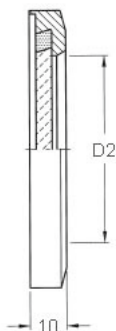
P/N KODIAL	DN	A	D1	D2	C
KVPZ16	16	12.7	25	15	1.0
KVPZ25	25	18.5	40	20	1.5
KVPZ40LA	40	18.5	55	38	3.0
KVPZ50	50	15	75	38	3.0

C: window thickness

P/N		DN	A	D1	D2	C	C	C	C	C	C
FUSED SILICA	SAPPHIRE					FUSED SILICA/CaF ₂	SAPPHIRE	QUARTZ NAT.	BaF ₂	MgF ₂	ZnSe
KVPZ16Q	KVPZ16S	16	12.7	25	15	1.5	1.5	1.5	2	2.5	1.5
KVPZ25Q	KVPZ25S	25	18.5	40	20	2	1.5	3	3	3	2
KVPZ40Q	KVPZ40S	40	18.5	55	38	3.5	1.5	3.5	5	4	3.75
KVPZ50Q	KVPZ50S	50	15	75	38	3.5	1.5	3.5	5	4	3.75

P/N	QUARTZ NATURAL Z-CUT	BaF ₂	CaF ₂	MgF ₂	ZnSe
DN from 16 to 50	BKVPZ--NQZ	BKVPZ--BAF2	BKVPZ--CAF2	BKVPZ--MGF2	BKVPZ--ZNSE

MECHANICALLY SEALED KF VIEWPORT ON ALUMINUM FLANGE



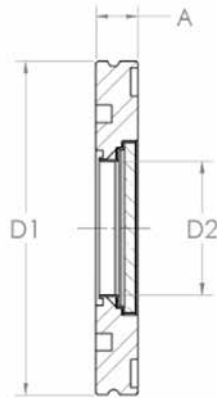
- Wide viewing angle
- Window = Borosilicate glass
- Bakeout temperature = 150°C
- Seal = FPM

P/N	DN	D1	D2	C
KVPZ25A	25	40	26	3.8
KVPZ40A	40	55	41	3.8
KVPZ50A	50	75	52	3.8

C: window thickness

All dimensions are in mm.

ISO K ZERO LENGTH VIEWPORTS



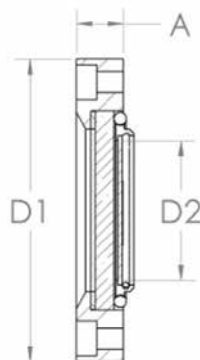
P/N KODIAL	DN	A	D1	D2
ISO63VPZ	63 ISO K	12	95	38
ISO100VPZ	100 ISO K	12	130	63
ISO160VPZ	160 ISO K	12	180	89
ISO200VPZ	200 ISO K	12	240	136
ISO250VPZ	250 ISO K	12	290	136

P/N		DN	A	D1	D2	C FUSED SILICA/ QUARTZ NAT.	C SAPPHIRE	C BaF ₂	C CaF ₂	C MgF ₂	C ZnSe
FUSED SILICA	SAPPHIRE										
ISO63QVPZ	ISO63SVPZ	63 ISO K	12	95	38	3.5	1.5	5	3.5	4	3.75
ISO100QVPZ	ISO100SVPZ	100 ISO K	12	130	63	4.5	2	7	5	5	5
ISO160QVPZ	ISO160SVPZ	160 ISO K	12	180	89	6	2.5	-	-	6.5	6.5

C: window thickness

P/N	QUARTZ NATURAL Z-CUT	BaF ₂	CaF ₂	MgF ₂	ZnSe
DN from 63 to 160	BISO--VPZNQZ	BISO--VPZBAF2	BISO--VPZCAF2	BISO--VPZMGF2	BISO--VPZZNSE

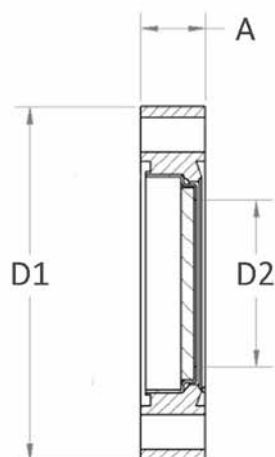
ISO F SIGHT GLASS VIEWPORTS



P/N KODIAL	DN	A	D1	D2
ISO63SGV	63 ISO F	20	130	60
ISO100SGV	100 ISO F	22	165	92
ISO160SGV	160 ISO F	30	225	142

All dimensions are in mm.

CF ZERO LENGTH VIEWPORTS



P/N KODIAL	DN	A	D1	D2
VPZ16	16	12.7	34	16
VPZ38	40	12.7	70	33
VPZ38LA	40	12.7	70	39
VPZ64	63	17.4	114	63
VPZ100	100	19.9	152	89
VPZ150	160	22.3	203	136
VPZ200	200	24.5	254	136

P/N		DN	A	D1	D2	C QUARTZ / QUARTZ NAT.	C SAPPHIRE	C BaF ₂	C CaF ₂	C MgF ₂	C ZnSe
FUSED SILICA	SAPPHIRE										
VPZ16Q	VPZ16S	16	12.7	34	15	1.5	1.5	2	1.5	2.5	1.5
VPZ38Q	VPZ38S	40	12.7	70	32	3	1.5	4	3	3	3
VPZ38LAQ	VPZ38LAS	40	12.7	70	38	3.5	1.5	5	3.5	4	3.75
VPZ64Q	VPZ64S	63	17.4	114	63	4.5	2	7	5	5	5
VP100Q	VP100S	100	19.9	152	89	6	2.5	9	7	6.5	6.5
VPZ150Q	VPZ150S	160	22.3	203	136	9.5	4	-	-	9.5	9.5
VPZ200Q	VPZ200S	200	24.5	254	136	9.5	4	-	-	9.5	9.5

P/N	QUARTZ NATURAL Z-CUT	BaF ₂	CaF ₂	MgF ₂	ZnSe
DN from 16 to 200	BVPZ--NQZ	BVPZ--BAF2	BVPZ--CAF2	BVPZ--MGF2	BVPZ--ZNSE

All dimensions are in mm.

CF ZERO LENGTH VIEWPORT WITH X-RAY PROTECTION LEAD GLASS

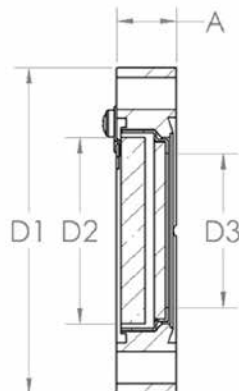
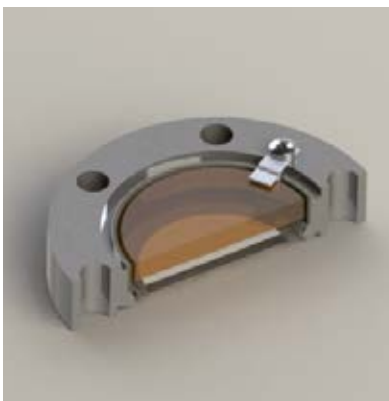
CF Kodial viewports are offered including an additional 5 mm thick Lead glass disc clipped in to the atmosphere side of the Kodial window for X-Ray protection. The viewports comprise a borosilicate glass optic which is sealed to a Kovar weld ring using an induction heater process. The Kodial/Lead glass window assembly provides visible transmission.

LEAD GLASS SPECIFICATIONS

OPTICAL PROPERTIES	
Refractive index	1.76
Transmission % @ 550 nm trough 5mm path	≥ 85.0
CHEMICAL PROPERTIES	
Lead (Pb)	48%
Barium (Ba)	15%
MECHANICAL PROPERTIES	
Density (g/cm ³)	4.8
Knoop hardness (kg/mm ²)	440
Young's modulus (GPa)	62.7
Poisson's ratio	0.23

SHIELDING CHARACTERISTICS

THICKNESS	MINIMUM LEAD EQUIVALENCE (mm) FOR STATED X-RAY TUBE VOLTAGE					
	100 kV	110 kV	150 kV	200 kV	250 kV	300 kV
mm						
5 - 6.5	1.7	1.6	1.5	1.3	1.3	1.3



P/N	P/N REPLACEMENT LEAD GLASS	DN	A	D1	D2	D3
VPZ16LG	LG16	16	12.7	34	18	16
VPZ38LG	LG38	40	12.7	70	42	33
VPZ64LG	LG64	63	17.4	114	72	63
VPZ100LG	LG100	100	19.9	152	106	89
VPZ150LG	LG150	160	22.3	203	156	136

All dimensions are in mm.

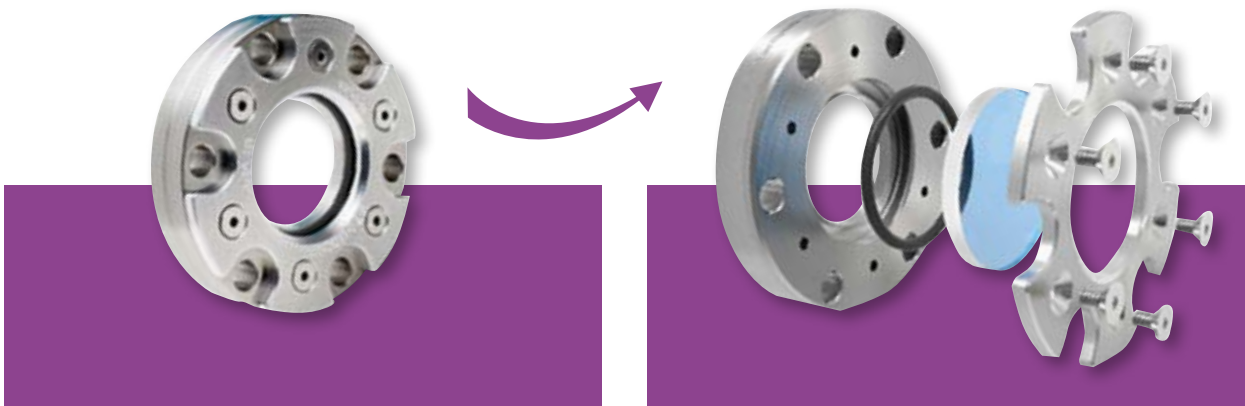
DEMOUNTABLE VIEWPORTS

Demountable high transmission viewports offer the option of applying optical coatings or cleaning of the viewports. For higher temperature applications up to 250°C, Kalrez O-rings can be used.

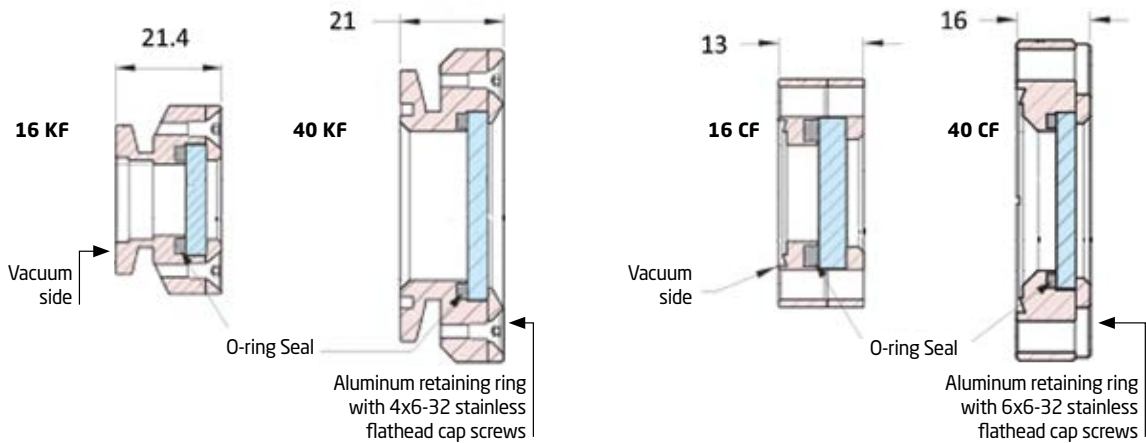
All of the demountable viewports employ a recessed zero profile glass design, which provides the widest viewing angles and maximum protection from damage.

Many types of materials (quartz, sapphire...) are available for replacement glass. Coated glasses on specification are also available on request.

- Standard glass material: Kodial
- Vacuum range: 1.10^{-8} mbar



P/N	DN	FLANGE OD	VIEW DIAMETER	GLASS THICKNESS
DKVPZ16	16 KF	30	14.22	4
DKVPZ40	40 KF	54.9	30.22	4
DVPZ16	16 CF	33.8	14.22	4
DVPZ40	40 CF	70.1	30.22	4



All dimensions are in mm.

KODIAL RE-ENTRANT CF VIEWPORTS

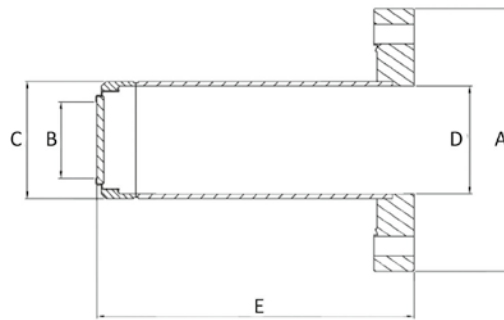
Re-entrant viewports are typically used for inserting microscopes or cameras in to UHV/Vacuum systems. The re-entrant viewports are offered in CF flanges as standard, but custom designed viewports can be manufactured using ISO and KF flange styles on request.

The viewports comprise a borosilicate glass optic which is sealed to a Kovar weld ring using an induction heater process.

Anti-reflective coatings to match customer reflectance requirements are also processed.



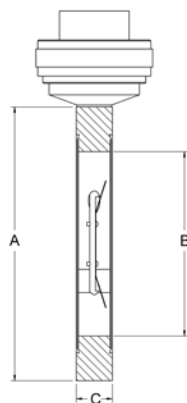
P/N	DN	A	B	C	D	E
VPZ40R	40	70	15	22.5	20.2	111
VPZ63R	63	114	32	50.8	47.5	138
VPZ63LAR	63	114	38	57.2	53.2	80
VPZ100R	100	152	63	76.2	70.2	201
VPZ160R	160	203	63	108	102	330
VPZ200R	200	254	89	159	153	330



All dimensions are in mm.

CF Viewport Shutters and Quick Access Doors

CF VIEWPORT SHUTTERS



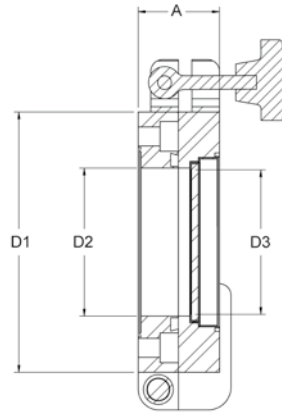
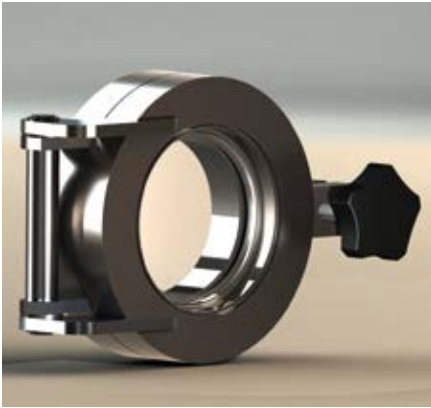
Magnetically driven viewport shutters with demountable shutter plate, bakeable to 230°C with magnet removed.

Rotary motion driven shutters on request.

P/N	DN	A	B	C
VPS35M	40	70	36	22
VPS63M	63	114	63	17.5
VPS100M	100	152	102	22
VPS150M	160	203	150	22

All dimensions are in mm.

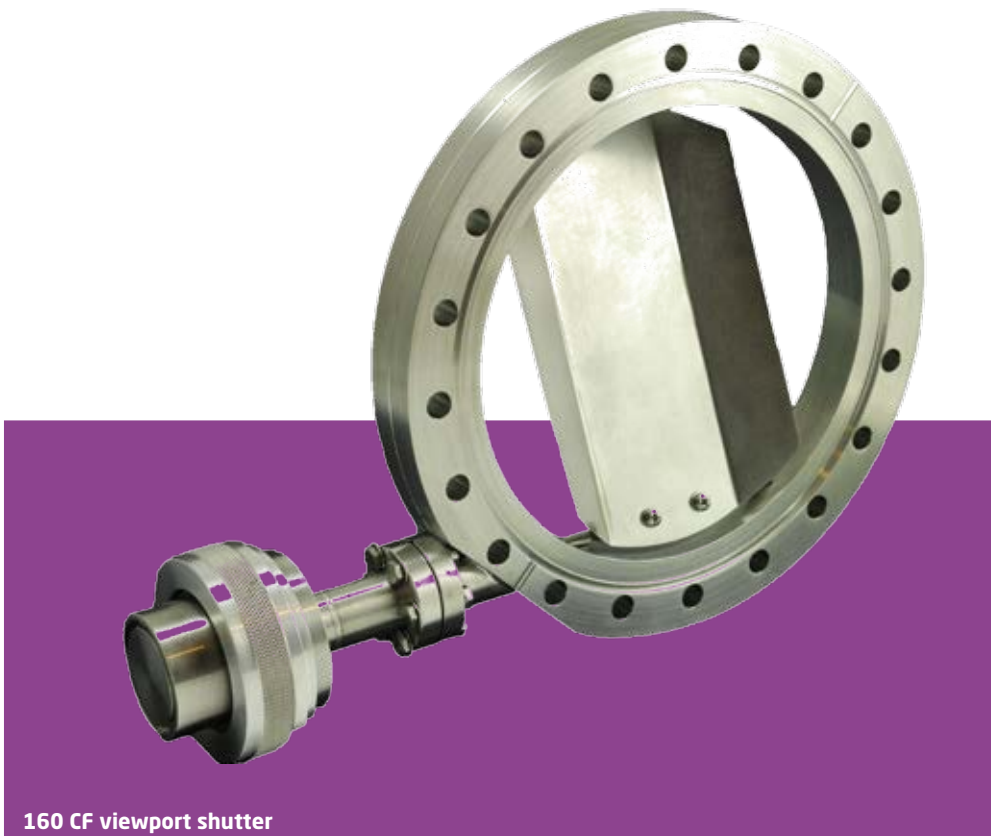
CF QUICK ACCESS DOOR WITH KODIAL VPZ VIEWPORT



Quick access doors comprise a tapped CF flange mounting face and viewport door based around the standard range of VPZ zero length windows. The door will bolt directly to a chamber using socket head cap screws, and utilises a supplied Viton seal bakeable to 200°C.

We can provide blank quick access doors on request as well as ISO designs.

P/N	DN	A	D1	D2	D3
QAD35	40	30	70	36	33
QAD63	63	30	114	64.5	63
QAD100	100	40	152	100	89
QAD150	160	45	203	147	136



160 CF viewport shutter

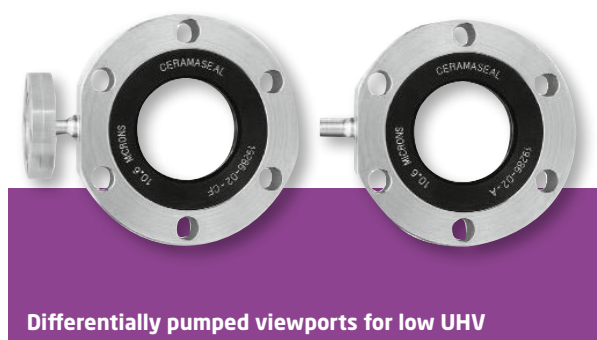
All dimensions are in mm.

Differentially Pumped Viewports

APPLICATIONS

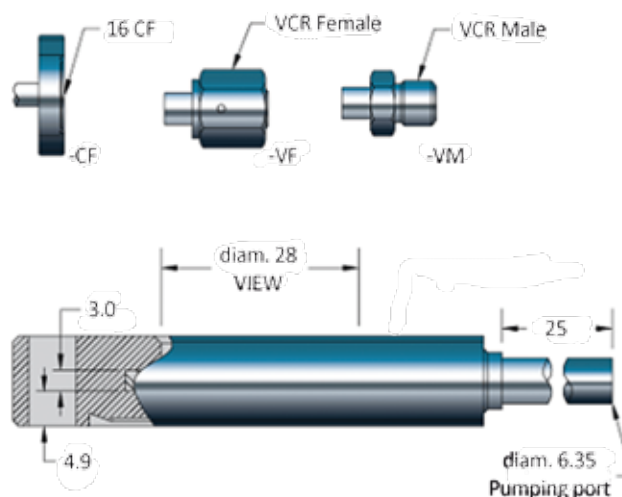
A few of the many applications in which these differentially pumped viewports are commonly used are:

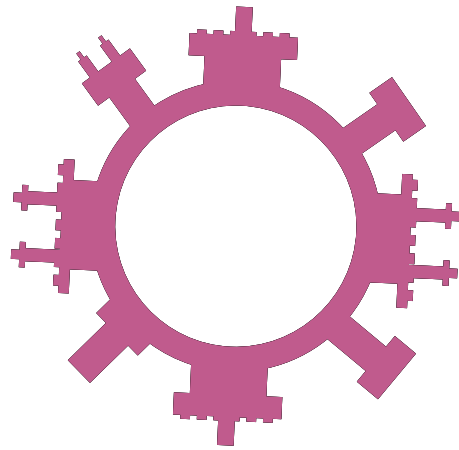
- Geochronology
- Geology
- Argon Dating



SPECIFICATIONS

- Flange material : Stainless Steel 304
- Window material : Zinc Selenide or Cleartran
- With anti-reflective coating
- Transmission range : 10.6 μm optimized
- Temperature range : -8°C to 204°C
- Leak rate $< 1.10^{-10}$ mbar.l/s (He)
- Installation: 40 CF or 63 CF flange
- View diameter: 28 mm
- Terminal option : tube, male VCR, female VCR, 16 CF
- Different optics are available upon request (Silicon, Germanium, Zinc Sulfide...)
- Specialized coatings are also available





VACUUM FEEDTHROUGHS

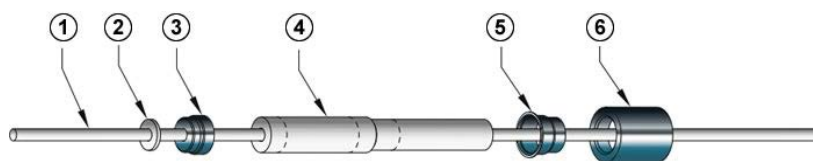
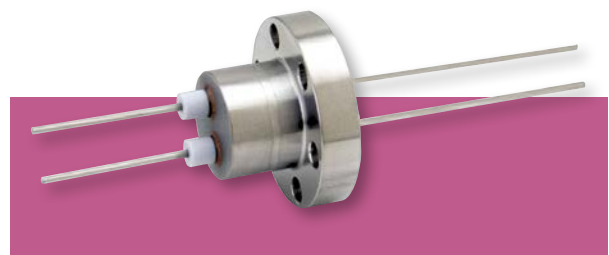
- Electrical Feedthroughs J 02
- Multipin Connectors J 14
- Coaxial Connectors J 22
- Thermocouples J 34
- Electrical Isolators J 40
- Fiber Optics Feedthroughs J 43
- In-Vacuum Wiring & Wiring Accessories J 47

Electrical Feedthroughs

A feedthrough is an assembly which provides for the transfer of electrical power, gases or fluids from outside an hermetic chamber to the inside. This is the solution for applications requiring hermeticity and electrical isolation. In addition to remaining leak-free in high and ultra-high vacuum, many of feedthroughs can accommodate:

- High temperatures
- Cryogenic temperatures
- Aggressive chemicals

Ceramaseal uses advanced techniques for control of special and critical processes, including 100 percent Helium leak testing and X-ray measurements for metallization control.



- (1) Conductor
- (2) Washer
- (3) Cap
- (4) Insulator
- (5) Sleeve
- (6) Weld Adapter

Typical Feedthrough Construction

STANDARD SPECIFICATIONS

- Voltages up to 125 kV
- Current up to 1000 A
- 1 to 41 conductors
- Temperature range (unless otherwise noted):
 - weld, CF flange: -269°C to 450°C
 - KF/ISO flanges: -25°C to 205°C
- Leak rate (He): 1.10^{-10} mbar.l.s⁻¹

EXTREME / CUSTOM DESIGN

- Multiple feedthrough flange assemblies
- 940-pin header assembly
- Corona-free designs up to 180 kV DC
- Currents in excess of 2500 A

INSTALLATION

- Braze
- Weld (Pulse-TIG, TIG, Laser, E-Beam)
- KF, ISO and CF flanges
- 1" Baseplate (see Baseplate section)

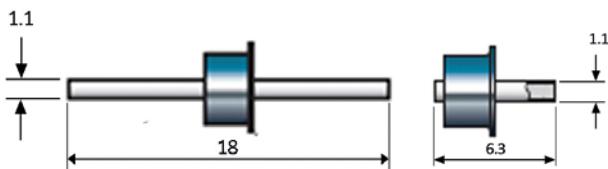
APPLICATIONS

- Semi-conductor processing equipments
- Particle accelerators
- Furnaces
- Analytical equipments
- In-vacuum coatings
- Satellite instrumentations
- X-ray detection equipments

TYPE	VOLTAGE DC	CURRENT / PIN (A)	NB OF PINS	CONNECTION TYPE
Superthru	500 V	11.5	1	-
Instrumentation / Power	500 V to 2 kV	1.1 to 16	1, 2, 4, 8	Contacts
Power	2 to 6 kV	1.8 to 27	1, 2, 4	Contacts
Pin Header	800 V to 1.5 kV	5	4, 6, 10	Contacts
Multipin Header	1 kV	5	3, 6, 10, 19, 32, 41	Contacts
Micro and Mini HV	10/15 kV	3/7.5	1 to 4	Air side plug / Contacts
Power Plug	5 to 25 kV	3.6 to 185	1 to 4	Air side plug / Contacts
High Power - Liquid Cooled	8 kV	330 to 1000	1 to 2	Contacts
High Voltage	30 to 100 kV	4 to 10	1 to 2	Air side plug / Contacts
RF Power-Liquid Cooled	8/14 kV	100 to 300	1 to 2	-
Baseplate	2 to 15 kV	8.2 to 185	1 to 4	Contacts

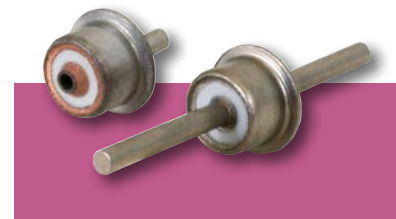
SUPERTHRU

NB OF PINS / TUBES	VOLTAGE DC (kV)	CURRENT (A / PIN OR TUBE)	PIN / TUBE SIZE (mm)	WELD LIP OD (mm)	TEMPERATURE RANGE (°C) (WELD OR BRAZE)	MATERIAL		
						HOUSING	INSULATION	PIN / TUBE
1	0.5	-(Kovar tube) 11.5 (Mo)	1.1	4.83	-80 to 450	Kovar	Alumina ceramic	Kovar tube Mo



Pin, weldable

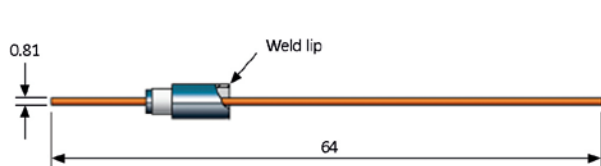
Tube, weldable



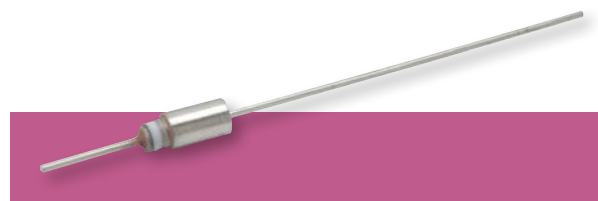
All dimensions are in mm.

INSTRUMENTATION / POWER

NB OF PINS	VOLTAGE DC (kV)	CURRENT (A / PIN)	PIN Ø (mm)	WELD LIP OD (mm)	MATERIAL		
					HOUSING	INSULATION	PIN
1	1	1.1 (SS 304) 5 (Ni) 8.5 (Mo) 16 (Cu)	0.81	3.91	SS 304	Alumina ceramic	SS 304 Ni Mo Cu
2	2			12.62			
4	2						
8	1.5			18.97			

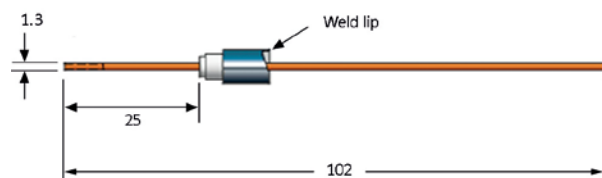


1 conductor, weldable

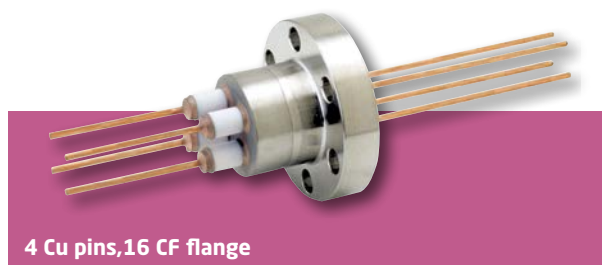
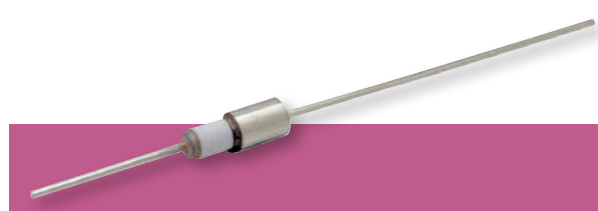


POWER

NB OF PINS	VOLTAGE DC (kV)	CURRENT (A / PIN)	PIN Ø (mm)	WELD LIP OD (mm)	MATERIAL		
					HOUSING	INSULATION	PIN
1	2 and 5	1.8 (SS 304) 8.2 (Ni) 13.5 (Mo) 27 (Cu)	1.3	6.27	SS 304	Alumina ceramic	SS 304 Ni Mo Cu
2	6			18.97			
4	3 and 6						



Single pin, weldable

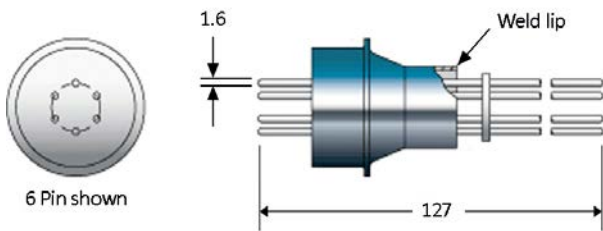


4 Cu pins, 16 CF flange

All dimensions are in mm.

PIN HEADER

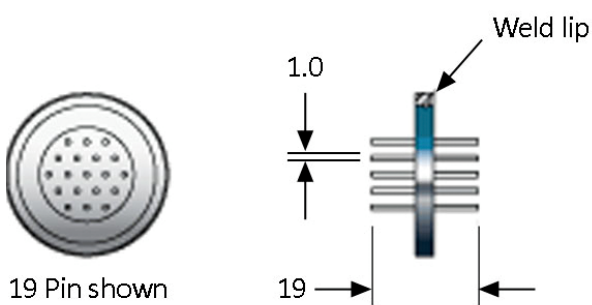
NB OF PINS	VOLTAGE DC (kV)	CURRENT (A / PIN)	PIN Ø (mm)	WELD LIP OD (mm)	MATERIAL		
					HOUSING	INSULATION	PIN
4	1.5	5	32	18.97	SS 304	Alumina ceramic	Alumel
6	1.5						
10	0.8						



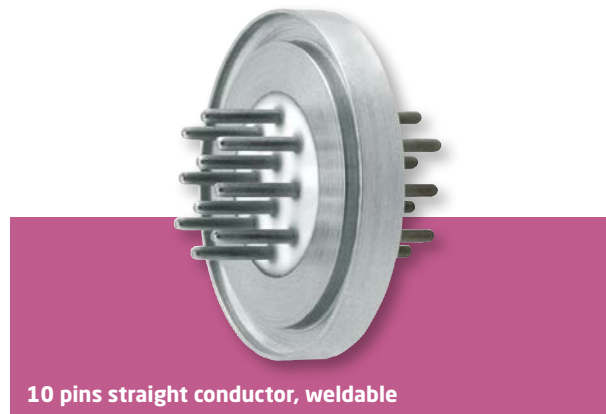
6 pins, weldable

MULTIPIN HEADER

NB OF PINS	VOLTAGE DC (kV)	CURRENT (A / PIN)	PIN Ø (mm)	WELD LIP OD (mm)	MATERIAL		
					HOUSING	INSULATION	PIN
3	1	5	1	18.92	SS 304	Glass-ceramic	SS 330 (Ni plated)
6				22.1			
10				25.27			
19				28.45			
32				34.8			
41				37.97			



19 pins straight conductor, weldable



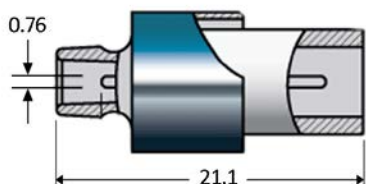
10 pins straight conductor, weldable

All dimensions are in mm.

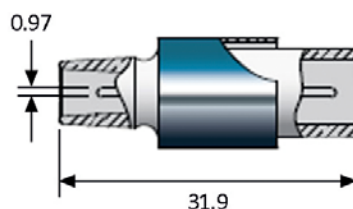
MICRO HV & MINI HV

NB OF PINS	VOLTAGE DC (kV)*	CURRENT (A / PIN)	PIN SIZE (mm)	WELD LIP OD (mm)	MATERIAL		
					HOUSING	INSULATION	PIN
1, 2, 3, 4	10	3	13	9.53	SS 304	Alumina ceramic	Mo (Au plated)
	15	7.5	23	12			

* When used with air side cable assembly.



Micro HV, weldable

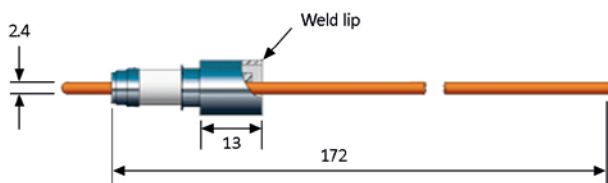


Mini HV, weldable

POWER PLUG

NB OF PINS	VOLTAGE DC (kV)*	CURRENT (A / PIN)	PIN Ø (mm)	WELD LIP OD (mm)	MATERIAL		
					HOUSING	INSULATION	PIN
1, 2, 3, 4	05 - 10	3.6 (SS 304) 16.5 (Ni) 55 (Cu)	2.4	11.05	SS 304	Alumina ceramic	SS 304 Ni Cu
	14 - 20						
	05 - 10	30 (Ni) 100 (Cu)	19	12.57			Ni Cu
	12 - 15	56 (Ni) 185 (Cu)	6.4	15.8			
	25						

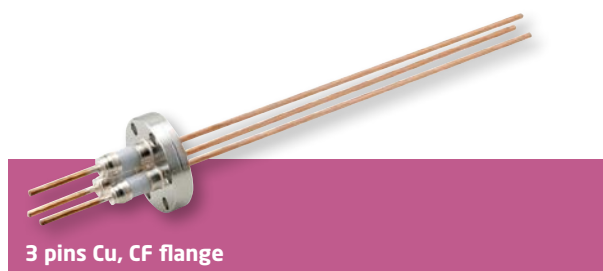
* When used with air side cable assembly.



5 - 10 kV, up to 55 A, 1 pin, weldable

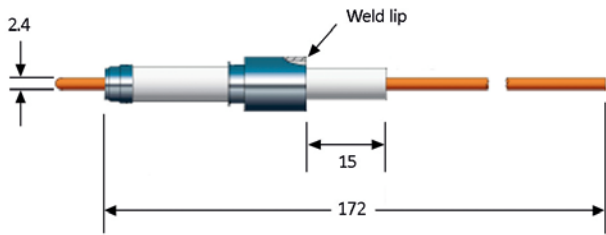


1 pin SS 304, weldable



3 pins Cu, CF flange

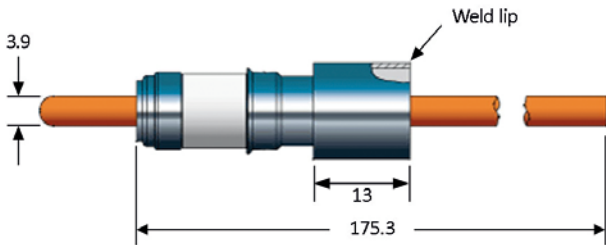
All dimensions are in mm.



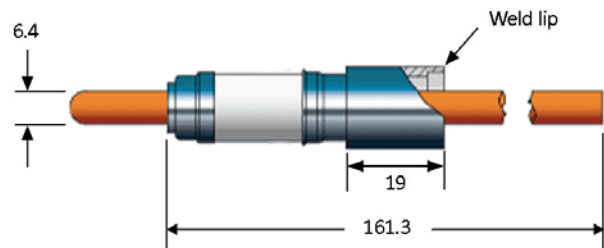
14 - 20 kV, up to 55 A, 1 pin, weldable



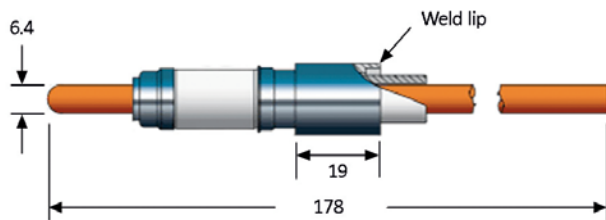
1 pin SS 304, weldable



5 - 10 kV, up to 100 A, 1 pin, weldable



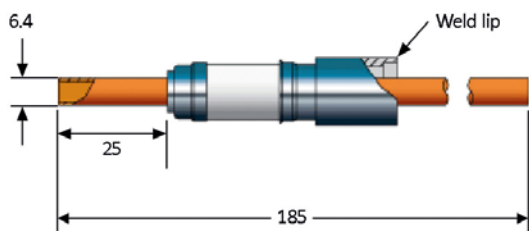
12 -15 kV, up to 185 A, 1 pin, weldable



25 kV, up to 185 A, 1 pin, weldable

POWER / LIQUID COOLED

NB OF PINS OR TUBES	VOLTAGE DC (kV)	CURRENT (A / PIN OR TUBE)	PIN / TUBE Ø (mm)	WELD LIP OD (mm)	MATERIAL		
					HOUSING	INSULATION	PIN / TUBE
1, 2	8	- (SS 304 & Cu tubes) 330 (Cu pin)	6.4	15.8	SS 304	Alumina ceramic	SS 304 (tube) Cu (tube) Cu
			9.5	18.97			
1		- (Cu tube) 470 (Cu)	12.7	22.1			Cu (tube) Cu
		- (Cu tube) 800 (Cu)	19	28.58			Cu
	1000	TeCu					



1 Cu tube , Ø 6.4 mm, weldable



1 Cu tube, Ø 9.5 mm, weldable



1 SS 304 tube, Ø 6.4 mm, KF flange

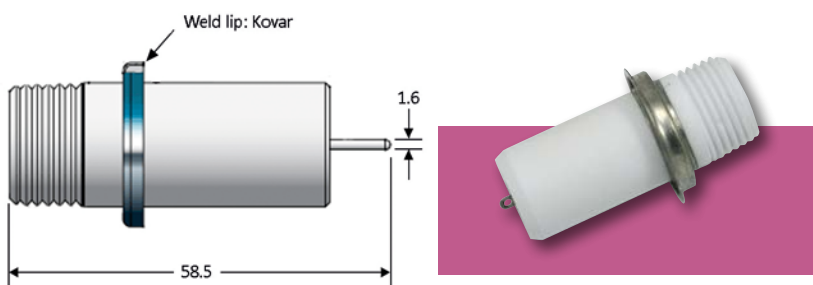
All dimensions are in mm.

HIGH VOLTAGE

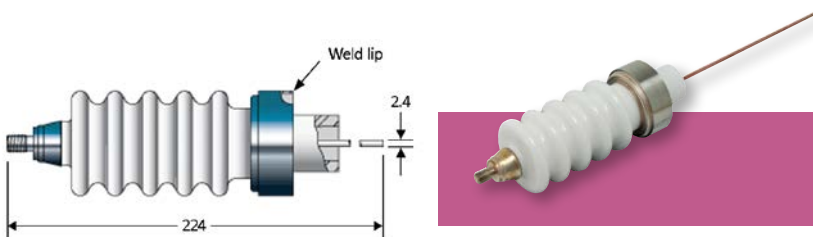
NB OF PINS	VOLTAGE DC (kV)*	CURRENT (A/PIN)	PIN Ø (mm)	WELD LIP OD (mm)	MATERIAL		
					HOUSING	INSULATION	PIN, TUBE
1	40	10	1.6	25.3	Kovar	Alumina ceramic	Cold rolled Steel (Ni plated)
	50		1.6	31.6			
1, 2	30	4	2.4	38.1	SS 304		SS 304
1	70	6.5	4	82.55			
	100		4	95.25			

* When used with air side cable assembly.

The use of silicone insulating grease is recommended for the air side cable assembly to feedthrough interface.



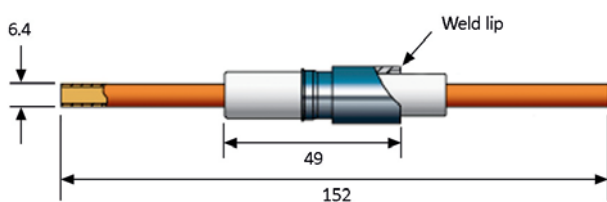
40 kV, 10 A, single pin, weldable



30 kV, 3 A, single pin, weldable

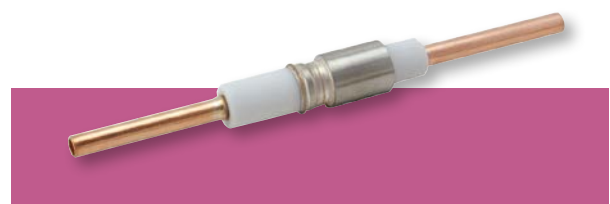
RF POWER - LIQUID COOLED

NB OF TUBES	VOLTAGE DC (kV)	CURRENT (A/TUBE)	FREQUENCY	O.D. TUBE (mm)	WELD LIP OD (mm)	TEMPERATURE RANGE (°C)	MATERIAL		
							HOUSING	INSULATION	TUBE
1	14	100	13.56 MHz	6.4	15.8	-55 to 355	SS 304	Alumina ceramic	Cu tube
2		100							
		200	450 kHz		37.97				
		250	300 kHz						
		300	250 kHz						



13.56 MHz single tube, weldable

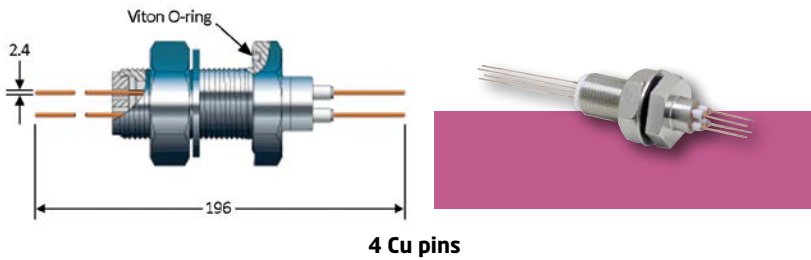
All dimensions are in mm.



BASEPLATE

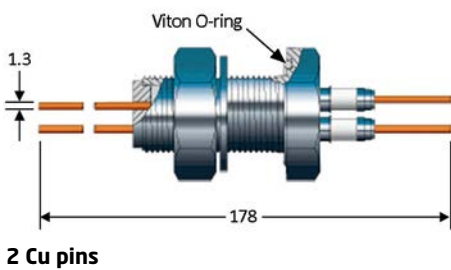
Instrumentation / Power 1" bolt

NB OF PINS	VOLTAGE DC (kV)	CURRENT (A / PIN)	PIN Ø (mm)	TEMPERATURE RANGE (°C)	MATERIAL			
					BOLT	INSULATION	PIN	O-RING
4	2	82 (Ni) 27 (Cu)	1.3	-25 to 205	SS 304	Alumina ceramic	Cu tube	Viton



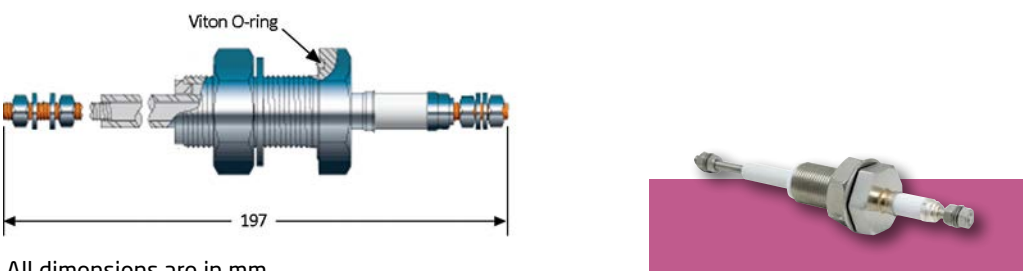
Power 1" bolt

NB OF PINS	VOLTAGE DC (kV)	CURRENT (A / PIN)	PIN Ø (mm)	TEMPERATURE RANGE (°C)	MATERIAL			
					BOLT	INSULATION	PIN	O-RING
1	5	55	2.4	-25 to 205	SS 304	Alumina ceramic	Cu	Viton
2, 3	2							



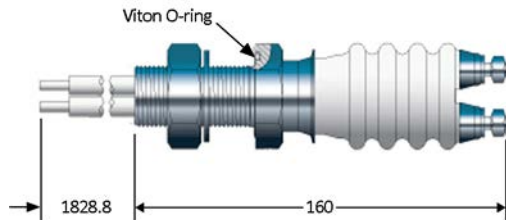
High Power 1" bolt

NB OF PINS	VOLTAGE DC (kV)	CURRENT (A / PIN)	TEMPERATURE RANGE (°C)	MATERIAL			
				BOLT	INSULATION	PIN	O-RING
1	12	185	-25 to 205	SS 304	Alumina ceramic	Cu	Viton



High Voltage 1" bolt

NB OF PINS	VOLTAGE DC (kV)	CURRENT (A / PIN)	TEMPERATURE RANGE (°C)	MATERIAL			
				BOLT	INSULATION	PIN	O-RING
2	15	185	-25 to 205	SS 304	Alumina ceramic	Cu	Viton

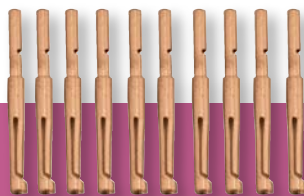


ACCESSORIES

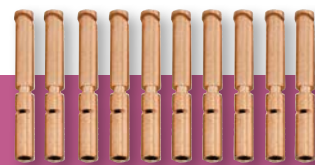
CONTACTS

Crimp type female contacts

ACCEPTS PIN Ø (mm)	CURRENT (A)	TEMPERATURE RANGE (°C)	MATERIAL
0.81	16	-269 to 200	BeCu
1.0	15	-200 to 200	Cu Alloy - Au Flash
1.1	2	-269 to 450	SS - Au plated
1.3	20	-269 to 200	BeCu
1.6	20	-269 to 200	BeCu
	10	-269 to 400	Ni Alloy
	-	-269 to 350	Alumel

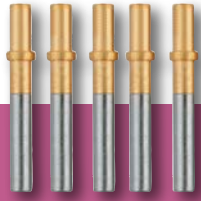


BeCu crimp contact (Ø 0.81)



BeCu crimp contact (Ø 1.6)

All dimensions are in mm.



Cu alloy - Au Flash contact (Ø 1.0)

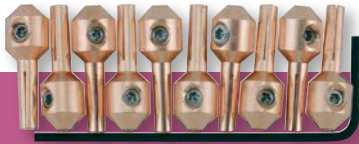
Other accessory: Crimp Tool
(for 0.64 - 1.90 mm crimp diameters)



Crimp tool

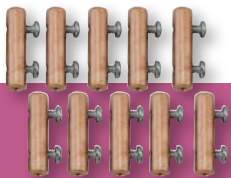
Set screw type contacts

SOCKET ACCEPTS PIN Ø (mm)	CURRENT (A)	TEMPERATURE RANGE (°C)	MATERIAL
1.3	25	-269 to 200	BeCu
2.4			



Barrel type contacts

MAX WIRE Ø (mm)	CURRENT (A)	TEMPERATURE RANGE (°C)	MATERIAL
1.3	20	-269 to 400	BeCu
1.6			
2.4	25		
3.9	30		
6.4	35		



Clamp type contacts

CONDUCTOR Ø (mm)	CURRENT (A)	TEMPERATURE RANGE (°C)	MATERIAL
6.4	350	-269 to 400	Cu
9.5	400		
12.7	500		
19.1	1000		



IN-VACUUM CABLE - KAPTON INSULATED - SINGLE CONDUCTOR

CONDUCTOR	VOLTAGE DC (kV)	CONDUCTOR (A)	WIRE			MATERIAL	
			LENGTH (m)	DIAMETER (mm)	INSULATION DIAMETER (mm)	INSULATION	WEAVE
28 AWG /stranded Ag plated Cu	0.85	2.5	9.1	7 x 0.13	0.7	Kapton Type FN	PEEK* monofilament
22 AWG /stranded Ag plated Cu		5	9.1	19 x 0.15	0.9		
12 AWG /stranded Ag plated Cu		20	4.6	37 x 0.3	2.6		

* PEEK: Polyetheretherketone.

Other accessory: adjustable wire stripper. 20 - 30 AWG (0.25 - 0.80 mm).

AIR SIDE CABLE ASSEMBLY

TYPE	CABLE TYPE	CABLE LENGTH (m)	VOLTAGE DC (kV)	CONDUCTOR (A)	TEMPERATURE RANGE (°C)	MATERIAL
Micro HV	24 AWG	2.44	10	3	-55 to 125	Silicone rubber
Mini HV	20 AWG		15	7.5		
10 kV Power plug	12 AWG		10	30		
20 kV Power plug	10 AWG		20	55		
Ø 0.154 Power plug	16 AWG		40	10		
Ø 0.250 Power plug	14 AWG		50	10		
40 kV Air side	8 AWG		10	75		
50 kV Air side	6 AWG		25	100		



Power plug air side cable

Multipin Connectors

The multipin connector category of products, from Ceramaseal, describes hermetic feedthroughs of two or more conducting pins that accept plugs on the air side. Some connectors allow for plugs on the vacuum side as well.

The products in this section are used primarily to provide instrumentation signals, voltage and/or current into a high-vacuum or ultra-high vacuum environment, with an in-line connection to outside instrumentation. Designs adapt a feedthrough (receptacle) with an industry-standard plug.

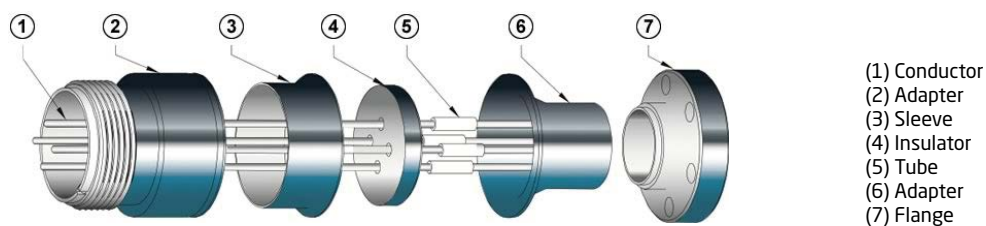
MATERIALS AND PROCESSES

Connectors are comprised of a hermetically brazed ceramic-to-metal assembly (receptacle) and one or more mating plugs. The receptacle is designed so that the overall stresses are minimized during the complex sealing process, thereby improving overall operating performance.

All receptacles are made from high-purity, vacuum compatible materials. The insulators are high-strength, low-loss alumina ceramics that are metalized using the refractory-metal sintering process. Metals include Kovar, Stainless Steel, Nickel-Iron alloys, Cupro-Nickel alloys, Molybdenum and Alumel. The assemblies are brazed together using Copper, Gold-Copper or Silver-Copper alloys.

The standard instrumentation plug is an MS-circular design. For applications where a vacuum plug is required or higher operating temperatures needed, the phenolic plug has been replaced with Teflon® or ceramic inserts.

Ceramaseal uses advanced techniques for control of special and critical processes, including 100 percent Helium leak testing and X-ray measurements for metallization control.



Typical Multipin Connector Construction

STANDARD SPECIFICATIONS

- Voltages to 12 kV DC
- Current to 40 A
- Internal Pressure 1.10^{-10} mbar to 40 bars
- Up to 50 pins / conductors
- Temperature range (unless otherwise noted):
 - weld, CF flange: -269 to 450°C
 - KF/ISO flanges: -25 to 205°C
- Leak rate (He): $< 1.10^{-10}$ mbar.l.s⁻¹

EXTREME / CUSTOM DESIGN

- 940-pin connector using thermocouple and instrumentation leads
- Combination multipin and coaxial connectors with a custom plug
- Multiple combinations of circular and D connectors in a flange
- Plugs bakeable to 650°C

INSTALLATION

- Weld (Pulse-TIG, TIG, Laser, E-Beam)
- KF, ISO and CF flanges
- NPT fitting
- 1" Baseplate

For additional vacuum-side attachments, see the contacts in the Accessories section.

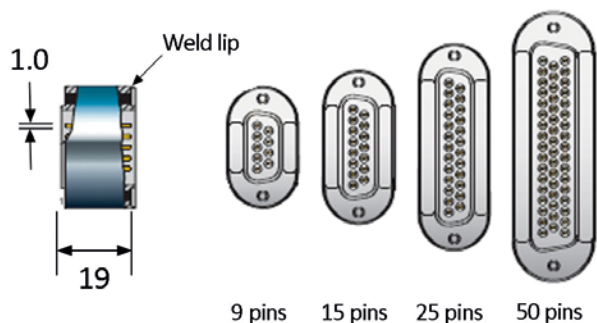
APPLICATIONS

- Semi-conductor processing equipments
- Analytical test and measurement equipments
- Pressure transducers
- Power generation: measurement and control
- Particle accelerators
- Furnaces
- Energy research

TYPE	VOLTAGE DC	CURRENT / PIN	NB OF PINS	CONNECTION TYPE
Sub D, MIL-C-24308	500 V	5 A	9, 15, 25, 50, 100	Air side plug / Vacuum side plug Contacts
Circular : Single ended, MIL-C-26482	1 kV	5 A	3, 6, 10, 19, 32, 41	Air side plug
Circular : Double ended, MIL-C-26482				Air side plug Vacuum side plug
Circular : Single ended, MIL-C-5015	700 V	7 A	4, 6, 10, 20, 35	Air side plug / Contacts
Circular: Single ended, Power MIL-C-5015	700 V	16 to 46 A	2, 4	
High Voltage	12 kV	13 A	2, 4, 7	Air side plug / Contacts
Baseplate	350 V, 700 V	7 A	8, 10	Air side plug / Contacts

SUB D TYPE MIL-C-24308

NB OF PINS	VOLTAGE DC (kV)	CURRENT (A / PIN)	PIN Ø (mm)	WELD LIP DIMENSIONS (mm)	MATERIAL		
					HOUSING	INSULATION	PIN
9	0.5	5	1	31.34 x 18.29	SS 304	Glass-ceramic	SS 300 (Au plated)
15				36.97 x 18.29			
25				53.39 x 18.29			
50				69.54 x 21.13			



Sub D type, weldable

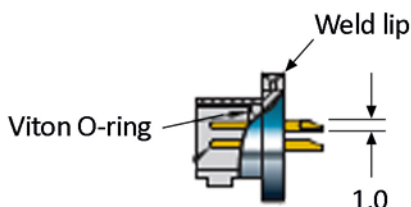


Sub D type, weldable

CIRCULAR: SINGLE ENDED MIL-C-26482 / DOUBLE ENDED MIL-C-26482

NB OF PINS	VOLTAGE DC (kV)	CURRENT (A / PIN)	PIN Ø (mm)	WELD LIP OD (mm)	MATERIAL			
					SHELL	INSULATION	PIN	PIN TYPE
3	1	5	1	18.92	SS 304	Glass-ceramic	SS 300 (Au plated)	Straight Solder Cup*
6				22.1				
10				25.27				
19				28.45				
32				34.8				
41				37.97				

*For Single Ended only, vacuum side.



Single ended, solder cup, weldable



3 straight pins, single ended, weldable

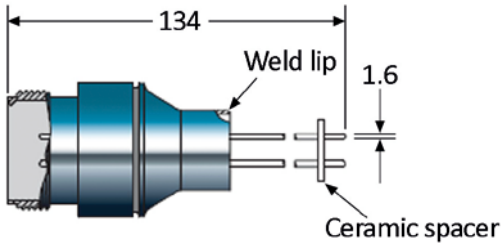


10 pins, double ended, weldable

CIRCULAR: SINGLE ENDED MIL-C-5015

NB OF PINS	VOLTAGE DC (kV)	CURRENT (A / PIN)	PIN Ø (mm)	WELD LIP OD (mm)	MATERIAL		
					SHELL	INSULATION	PIN
4	0.7	7	1.6	18.97	SS 304	Alumina ceramic	Alumel
6							
10				38.1			
20							
35							

All dimensions are in mm.



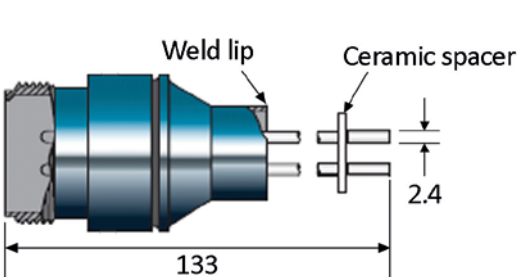
4, 6 & 10 pins, weldable



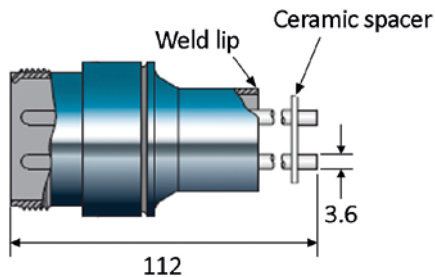
4 pins, weldable

CIRCULAR: SINGLE ENDED - POWER MIL-C-5015

NB OF PINS	VOLTAGE DC (kV)	CURRENT (A/PIN)	PIN Ø (mm)	WELD LIP OD (mm)	MATERIAL		
					SHELL	INSULATION	PIN
2	0.7	16 (Ni) 28 Mo	2.4	18.97	SS 304	Alumina ceramic	Ni Mo
4							
2		25 (Ni) 46 (Mo)	3.6	25.4			
4							



Pin Ø 2.4 mm, weldable

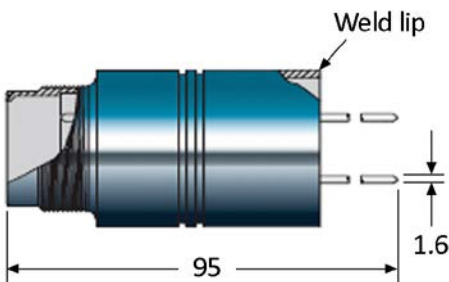


Pin Ø 3.6 mm, weldable

HIGH VOLTAGE

NB OF PINS	VOLTAGE DC (kV)*	CURRENT (A/PIN)*	PIN Ø (mm)	WELD LIP OD (mm)	MATERIAL		
					SHELL	INSULATION	PIN
2	12 (pin/pin and pin/shell)	13	1.6	31.62	SS 304	Alumina ceramic	Mo (Ni plated)
4							
7				37.97			

*When used with air side assembly.



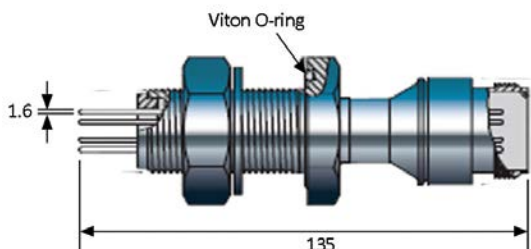
2 & 4 pins, weldable

All dimensions are in mm.

BASEPLATE

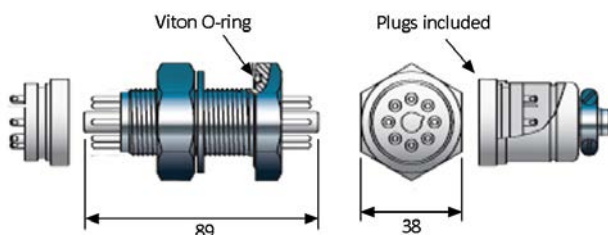
MIL-C-5015 Type 1" bolt

NB OF PINS	VOLTAGE DC (kV)	CURRENT (A/PIN)	PIN Ø (mm)	WELD LIP OD (mm)	MATERIAL		
					BOLT	INSULATION	PIN
10	0.7	7	1.6	25	SS 304	Alumina ceramic	Alumel



Octal Connector 1" bolt

NB OF PINS	VOLTAGE DC (kV)	CURRENT (A/PIN)	PIN Ø (mm)	MATERIAL		
				BOLT	INSULATION	PIN
8	0.35	7	1.6	SS 304	Glass-ceramic	Alumel



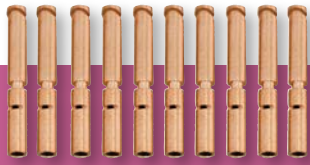
ACCESSORIES

CONTACTS

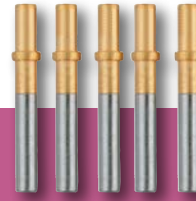
Crimp type female contacts

ACCEPTS PIN Ø (mm)	CURRENT (A)	TEMPERATURE RANGE (°C)	MATERIAL
1.0	15	-200 to 200	Cu Alloy - Au Flash
1.3	20	-269 to 200	BeCu
	20	-269 to 200	BeCu
1.6	10	-269 to 400	Ni Alloy
	-	-269 to 350	Alumel

All dimensions are in mm.



BeCu crimp contact (Ø 1.3)



Cu alloy - Au Flash crimp contact (Ø 1.0)

Other accessory: Crimp Tool
(for 0.64 - 1.90 mm crimp diameters)



Crimp tool

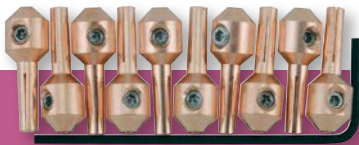
Crimp type male contacts

ACCEPTS PIN Ø (mm)	CURRENT (A)	TEMPERATURE RANGE (°C)	MATERIAL
1.1	15	-200 to 200	Cu alloy - Au plated

Other accessory: Crimp Tool (for 0.64 - 1.90 mm crimp diameters).

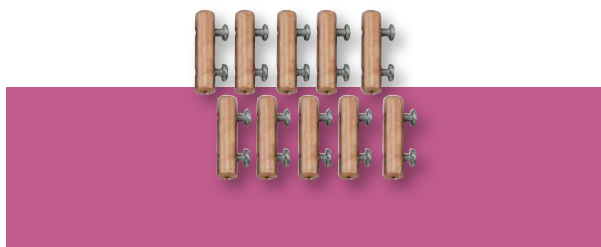
Set screw type contacts

SOCKET ACCEPTS PIN L (mm)	CURRENT (A)	TEMPERATURE RANGE (°C)	MATERIAL
2.4	25	-269 to 200	BeCu



Barrel type contacts

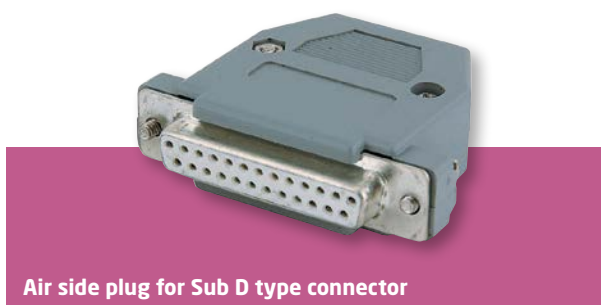
MAX WIRE Ø (mm)	CURRENT (A)	TEMPERATURE RANGE (°C)	MATERIAL
1.6	20	-269 to 400	BeCu
2.4	25		
3.9	30		



PLUGS

Air side plugs

TYPE	VOLTAGE DC (kV)	NB OF PINS	CURRENT (A)	TEMPERATURE RANGE (°C)	MATERIAL
Sub D Type	0.5	9, 15, 25 & 50	5	-55 to 105	Cu alloy
MIL-C-26482 Type	1	3, 6, 10, 19, 32 & 41	1	-55 to 200	Cu alloy
MIL-C-5015 Type	0.7	4, 6, 10, 20 & 35	13	-55 to 125	Cu alloy
		4, 6 & 10	4.8	-55 to 260	Alumel
Power MIL-C-5015 Type : .094 contacts	0.7	2 & 4	23	-55 to 125	Cu alloy
Power MIL-C-5015 Type : .142 contacts	0.7	2 & 4	46	-55 to 125	Cu alloy
High Voltage	12	2, 4 & 7	13	-55 to 85	Cu alloy
Baseplate	0.7	10	13	-55 to 125	Cu alloy



Air side plug for Sub D type connector



Air side plug for circular MIL-C-26482 connector



Air side plug for circular MIL-C-5015

Vacuum side plugs

TYPE	VOLTAGE DC (kV)	NB OF PINS	CURRENT (A)	TEMPERATURE RANGE (°C)	MATERIAL
Sub D Type	0.5	9, 15, 25, 51	5	-200 to 200	Cu alloy
MIL-C-26482 Type	1	3, 6, 10, 19, 32, 41	1		



Vacuum side plug for Sub D type connector

IN-VACUUM CABLES - KAPTON INSULATED

Single conductor

CONDUCTOR	VOLTAGE DC (kV)	CONDUCTOR (A)	WIRE			TEMPERATURE RANGE (°C)	MATERIAL	
			LENGTH (m)	Ø (mm)	INSULATION Ø (mm)		INSULATION	WEAVE
28 AWG/ stranded Ag plated Cu	0.85	2.5	9.1	7 x 0.13	0.7	-55 to 200	Kapton type FN	PEEK* monofilament
22 AWG/ stranded Ag plated Cu		5	9.1	19 x 0.15	0.9			
12 AWG/ stranded Ag plated Cu		20	4.6	37 x 0.3	2.6			

*Polyetheetherketone.

Ribbon cable

CONDUCTOR	NB OF CONDUCTORS	VOLTAGE DC (kV)	CONDUCTOR (A)	WIRE				TEMPERATURE RANGE (°C)	MATERIAL	
				LENGTH (mm)	WIDTH (mm)	Ø (mm)	INSULATION Ø (mm)		INSULATION	WEAVE
22 AWG/ stranded Ag plated Cu	9	0.85	5	482.6 990.6	10.2	19 x 0.15	0.89	-55 to 200	Kapton type FN	PEEK* mono- filament
	15				17.8					
	25				30.5					

*Polyetheetherketone.

Other accessory: adjustable wire stripper, 20 - 30 AWG (0.25 - 0.80 mm).

Coaxial Connectors

Coaxial connectors consist of two concentric conductors: a central conductor surrounded by and insulated from a second tubular conductor. The outside conductor is usually at ground potential but in some product variations may be floated off ground by employing an additional insulating ring. The outer conducting surface can prevent radio frequency noise from passing to or from the central conductor.

Neyco offers a complete line of industry-standard coaxial connectors, from Ceramaseal, ranging from Microdot through SHV. These coaxial connectors are manufactured for high and ultra-high vacuum service.

50-Ohm matched impedance coaxial connectors are known throughout the industry for their superior performance in ultra-high vacuum and high-temperature applications. Ceramaseal has engineered special interfacing designs between the insulator and hardware to achieve low signal reflection at high frequencies.

MATERIALS AND PROCESSES

Connectors are comprised of a hermetically brazed ceramic-to-metal assembly (receptacle) and mating plug. The receptacle is designed so that the overall stresses are minimized during the complex sealing process, thereby improving overall operating performance. 50-Ohm matched impedance connectors feature non-magnetic metals including Gold-plated Inconel contacts and Stainless Steel 304 adapters.

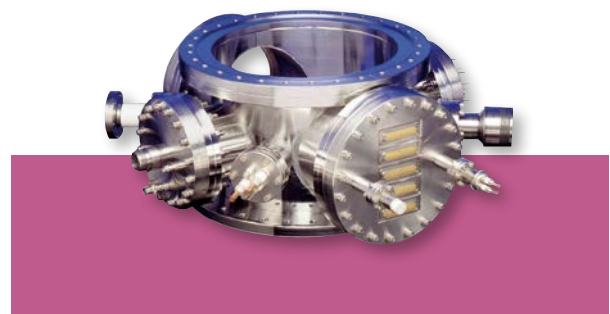
All receptacles are made from high-purity, vacuum compatible materials. The insulators are high-strength, low-loss alumina ceramics that are metalized using the

refractory-metal sintering process. The hardware is primarily Stainless Steel or Nickel-Iron alloys, but conductor materials may vary according to design. The assemblies are brazed together using Copper, Gold-Copper and Silver-Copper alloys.

Advanced techniques for control of special and critical processes are used, including 100 percent Helium leak testing and X-ray measurements for metallization control.

Microdot connectors are the smallest standard threaded interface connectors we offer for use in ultra-high vacuum (UHV). Standard Microdot connectors are available as single ended or double ended units.

SMA (Subminiature Type-A) connectors offer a threaded interface in a subminiature size. Matched impedance designs are also available and are ideally suited for high frequency signal transmission. Standard SMA connectors are available as single ended or double ended units.



SMB (Subminiature Type-B) connectors are designed for quick connecting and disconnecting. This is made possible by the SMB's spring retention connector. Standard SMB connectors are single ended and available with a grounded shield or a floating shield configuration.

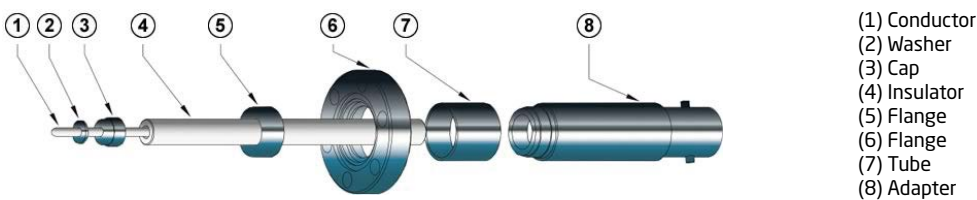
BNC connectors are the most popular miniature-sized connector and can accommodate up to 500 V DC. The BNC is characterized by its quick connect/disconnect bayonet coupling. Matched impedance designs are also available and are ideally suited for high frequency signal transmission. Standard BNC connectors are available as single or double ended units with a grounded shield or a floating shield.

MHV (Miniature High Voltage) connectors are designed for high voltage applications of BNC connectors (DC voltage between 500 V and 5 kV). MHV connectors are sometimes referred to as "high-voltage BNCs". Standard MHV connectors are available as single ended or double ended units with a floating shield or a grounded shield.

SHV (Safe High Voltage) connectors feature an improved interface over the MHV. The SHV outer contact ground connection is maintained through the center contact mating cycle. The center contact is recessed to prevent shock hazard when disengaged. Four designs are included in this Product Guide covering DC voltages from 5 kV to as high as 20 kV. The BSHV version is a bakeable SHV connector that exhibits the safety level of the SHV. Standard SHV connectors are single ended and available with a grounded shield or a floating shield (SHV 5 kV) configuration.

Type N series connectors are the most popular medium-sized connectors, accommodating voltages up to 1.5 kV. The threaded coupling provides low noise and increases resistance to shock and vibration. Matched impedance designs are also available and are ideally suited for high frequency signal transmission. Standard Type N connectors are available as single or double ended units.

HN series connectors are Type N series connectors that have been designed to take higher voltages (up to 7 kV). These matched impedance designs are ideally suited for high frequency signal transmission.



Typical Coaxial Connector Construction

STANDARD SPECIFICATIONS

- Grounded and floating shield versions
- High frequency 50 Ω impedance matched connectors
- Connectors sold with or without air side plugs
- Temperature range:
 - KF/ISO: -25°C to 205°C
 - Other installations:
 - -55°C to 450°C for SMB and Microdot connectors
 - -269°C to 350°C for type N to SMA connectors
 - -269°C to 450°C for other connectors

EXTREME / CUSTOM DESIGN

- Multiple coaxial and multipin connectors in a flange
- Double ended 50 Ω coaxial connector with floating shield for a cryogenic application
- Coaxial connectors using a glass ceramic seal for cryogenic and caustic environments
- LC connector and other military style coaxial connectors

INSTALLATION

Standard installation mountings include:

- Weld (Pulse-TIG, TIG, Laser, E-Beam)
- KF, ISO and CF flanges

APPLICATIONS

- Telecommunications
- Semi-conductor processing equipments
- Aerospace equipments
- Medical equipments
- Microwave
- In-vacuum coating
- Particle accelerators

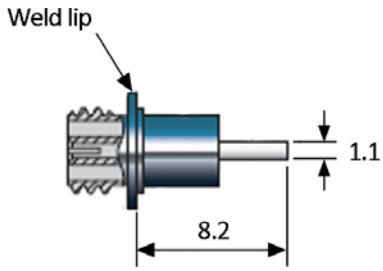
HIGH FREQUENCY 50 OHM DESIGNS

- SMA
- BNC
- Type N
- HN

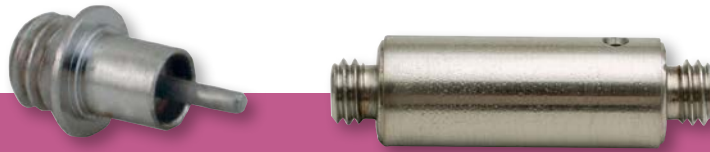
TYPE	VOLTAGE DC	CURRENT	NUMBER OF PINS	CONNECTION TYPE	COUPLING	CABLE
Microdot	1 kV	2 A	1, 2, 3, 4	Air side cable / Contacts, Vacuum side cable	Threaded	Ø 2, 50 Ω
SMB	500 V	1.4 A	1 to 4	Air side plug / Contacts	Push-on	RG-174/U
SMA	500 V	1 to 1.8 A	1 to 4	Air side plug / Contacts	Threaded	RG-58/U
BNC	500 V	1 to 3.6 A	1 to 4	Air side plug / Contacts	Bayonet	RG-58/U
MHV	5 kV	3.6 A	1 to 4	Air side plug / Contacts	Bayonet	RG-59/U
Type N	1.5 kV	1, 3.6 A	1	Air side plug / Contacts	Threaded	RG-8/U RG-9/U RG-10/U
HN	7 kV	7 A	1	Air side plug / Contacts	Threaded	RG-8/U RG-9/U RG-10/U RG-87/U RG-213/U RG-214/U RG-225/U
SHV 5 kV	5 kV	16.5 A	1 to 4	Air side plug / Contacts	Bayonet	RG-59/U
BSHV 7.5 kV	7.5 kV	16.5 A	1	Air side plug / Contacts	Threaded	RG-59/U
SHV 10 kV	10 kV	10 A	1 to 4	Air side plug / Contacts	Bayonet	RG-58/U
SHV 20 kV	20 kV	16.5	1	Air side plug / Contacts	Bayonet	RG-213/U
Between Series: - Type N/SMA - BNC/Microdot	1.5 kV 500 V	1 A 5 A	1 1 to 4	Air side plug, cable / Vacuum side cable	See above	See above

MICRODOT CONNECTORS

TYPE	NB OF PINS	VOLTAGE DC (kV)	CURRENT (A / PIN)	PIN Ø (mm)	WELD LIP OD (mm)	MATERIAL		
						HOUSING	INSULATION	PIN
Low Frequency Single Ended Grounded Shield	1, 2, 3, 4	1	2	1.1	6.35	Kovar	Alumina ceramic	Mo
Low Frequency Double Ended Grounded Shield				-	7.94	SS 304		SS 304



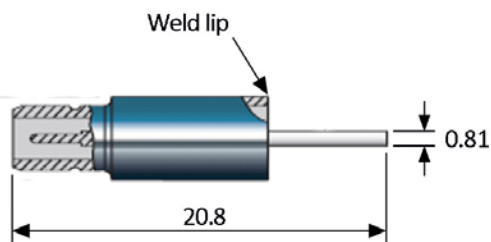
Low frequency, single ended, weldable



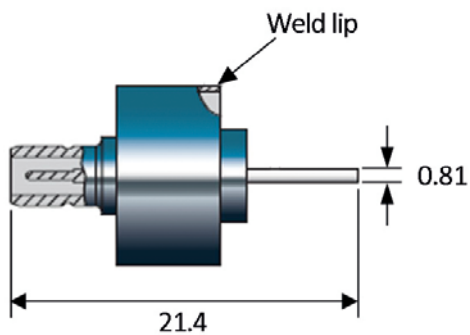
Low frequency, single ended & double ended, weldable

SMB CONNECTORS

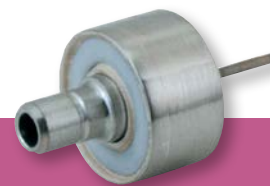
TYPE	NB OF PINS	VOLTAGE DC (kV)	CURRENT (A / PIN)	PIN Ø (mm)	WELD LIP OD (mm)	MATERIAL		
						HOUSING	INSULATION	PIN
Low Frequency Single Ended Grounded Shield	1, 2, 3, 4	0.5	1.4	0.81	4.75	Kovar	Alumina ceramic	SS 416
Low Frequency Single Ended Floating Shield		Pin / Shield: 0.5 Shield / Grd: 1			11.05			



Low frequency, single ended, grounded shield, weldable



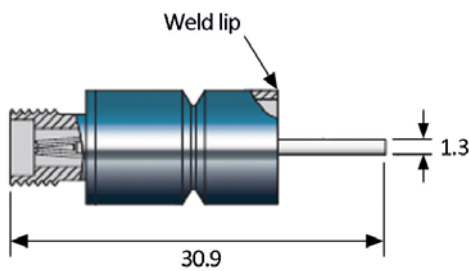
Low frequency, single ended, floating shield, weldable



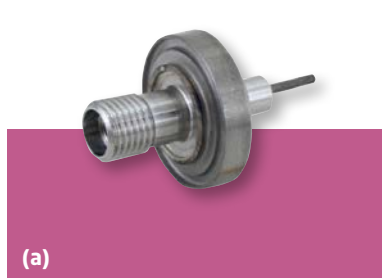
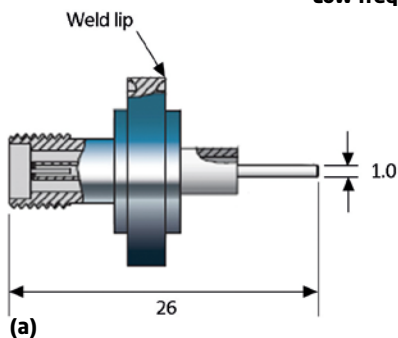
All dimensions are in mm.

SMA CONNECTORS

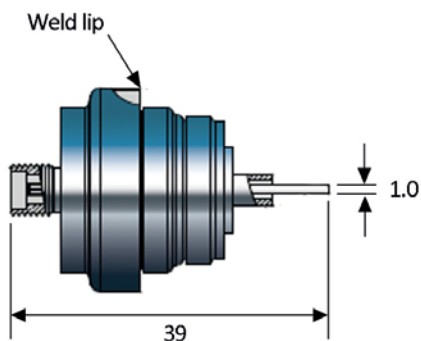
TYPE	NB OF PINS	VOLTAGE DC (kV)	CURRENT (A / PIN)	PIN Ø (mm)	WELD LIP OD (mm)	MATERIAL		
						HOUSING	INSULATION	PIN
Low Frequency Single Ended Grounded Shield	1, 2, 3, 4	0.5	1.8	1.3	9.45	SS 304	Alumina ceramic	SS 304
50 Ohm High Frequency Single Ended Grounded Shield			1	1	15.80		Glass-Ceramic	Inconel X-750
50 Ohm High Frequency Double Ended Grounded Shield							Glass-Ceramic	
50 Ohm High Frequency Single or Double Ended Floating Shield	1	Pin/Shield: 0.5 Shield/Gnd: 2.5			24.64	52 NiFe	Glass-Ceramic & Alumina ceramic	



Low frequency, single ended, grounded shield, weldable



50 Ω, high frequency, single ended (a), double ended (b), grounded shield, weldable

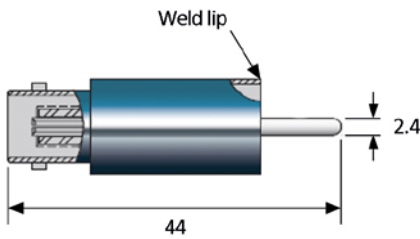


50 Ω, high frequency, single ended, floating shield, weldable

All dimensions are in mm.

BNC CONNECTORS

TYPE	NB OF PINS	VOLTAGE DC (kV)	CURRENT (A/PIN)	PIN Ø (mm)	WELD LIP OD (mm)	MATERIAL		
						HOUSING	INSULATION	PIN
Low Frequency Single Ended Grounded Shield	1, 2, 3, 4	0.5	3.6	2.4	12.57	SS 304	Alumina ceramic	SS 304
Low Frequency Double Ended Grounded Shield								
Low Frequency Single Ended Floating Shield	1	Pin/Shield: 0.5 Shield/Gnd: 2.5	3.6	2.4	24.64	52 NiFe	Alumina ceramic	SS 304
Low Frequency Double Ended Floating Shield	1				18.97			
50 Ohm High Frequency Single or Double Ended Grounded Shield	1	0.5	1	1	15.80	SS 304	Glass-Ceramic	Inconel X-750



(a)

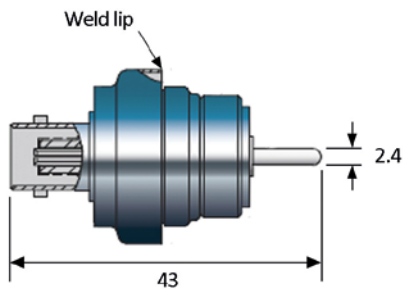


(a)

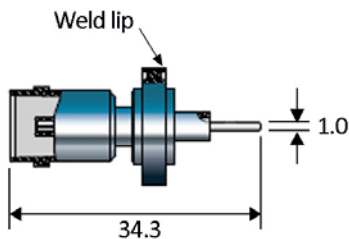


(b)

Low frequency, single ended (a), double ended (b), grounded shield, weldable



Low frequency, single ended, floating shield, weldable

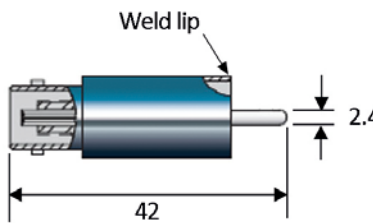


50 Ω, high frequency, single ended, grounded shield, weldable

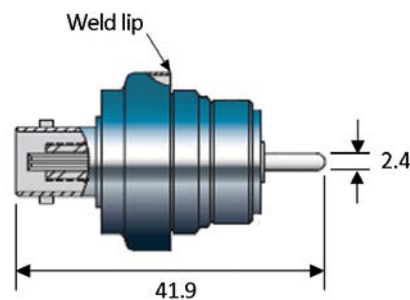
All dimensions are in mm.

MHV CONNECTORS

TYPE	NB OF PINS	VOLTAGE DC (kV)	CURRENT (A / PIN)	PIN Ø (mm)	WELD LIP OD (mm)	MATERIAL		
						HOUSING	INSULATION	PIN
Low Frequency Single Ended Grounded Shield	1, 2, 3, 4	5	3.6	2.4	12.60	SS 304	Alumina ceramic	SS 304
Low Frequency Double Ended Grounded Shield				-	12.57			
Low Frequency Single Ended Floating Shield	1	Pin/Shield: 5 Shield/Gnd: 2.5		2.4	24.60	52 NiFe		52 NiFe



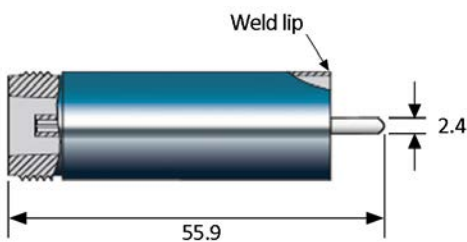
Low frequency, single ended, grounded shield, weldable



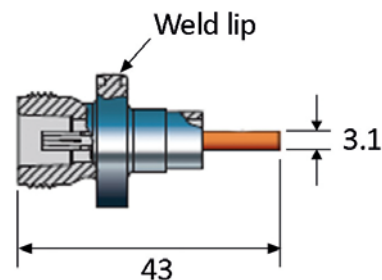
Low frequency, single ended, floating shield, weldable

TYPE N CONNECTORS

TYPE	NB OF PINS	VOLTAGE DC (kV)	CURRENT (A / PIN)	PIN Ø (mm)	WELD LIP OD (mm)	MATERIAL		
						HOUSING	INSULATION	PIN
Low Frequency Single or double Ended Grounded Shield	1	1.5	3.6	2.4	15.80	SS 304	Alumina ceramic	SS 304
50 Ohm High Frequency Single or Double Ended Grounded Shield			1	3.1	22.10			



Low frequency, single ended, grounded shield, weldable

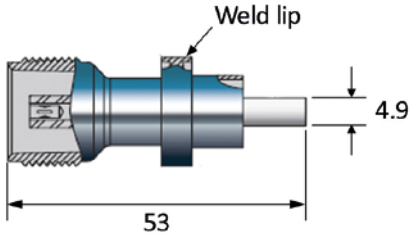


50 Ω, high frequency, single ended, grounded shield, weldable

All dimensions are in mm.

HN CONNECTORS

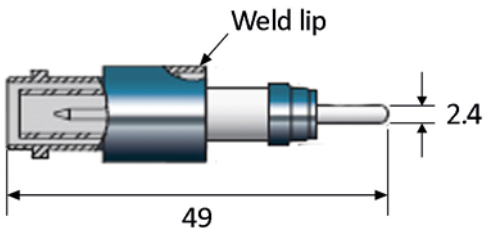
TYPE	NB OF PINS	VOLTAGE DC (kV)	CURRENT (A / PIN)	PIN Ø (mm)	WELD LIP OD (mm)	MATERIAL		
						HOUSING	INSULATION	PIN
50 Ohm High Frequency Single	1	7	7	4.9	18.97	SS 304	Alumina ceramic	CuNi



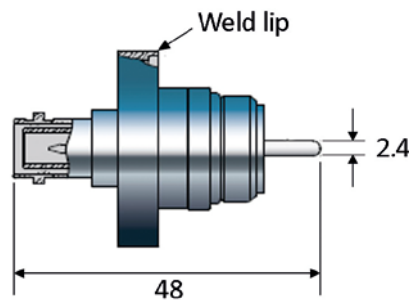
50 Ω, high frequency, single ended, grounded shield, weldable

SHV CONNECTORS

TYPE	NB OF PINS	VOLTAGE DC (kV)	CURRENT (A / PIN)	PIN Ø (mm)	WELD LIP OD (mm)	MATERIAL		
						HOUSING	INSULATION	PIN
Single Ended Grounded Shield Exposed or Recessed Insulator	1, 2, 3, 4	5	16.5	2.4	12.57	SS 304	Alumina ceramic	Ni
Single Ended Floating Shield	1				32.00			
Single Ended Grounded Shield Exposed Insulator	1, 2, 3, 4	10	10	1.6	12.57			
Single Ended Grounded Shield Recessed Insulator		10			15.24			
Single Ended Grounded Shield Exposed or Recessed Insulator	1	20	16.5	2.4	15.80			

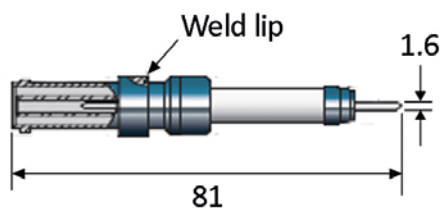


SHV 5 kV, single ended, grounded shield, exposed insulator, weldable

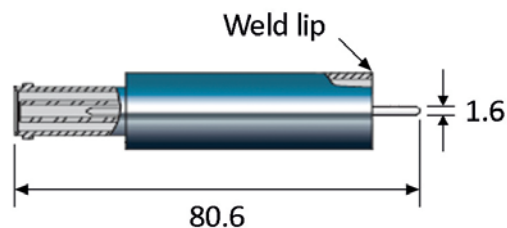


SHV 5 kV, single ended, floated shield, weldable

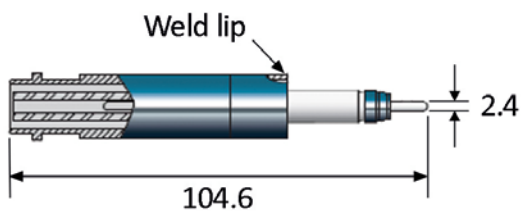
All dimensions are in mm.



SHV 10 kV, single ended, grounded shield, exposed insulator, weldable



SHV 10 kV, single ended, grounded shield, recessed insulator, weldable



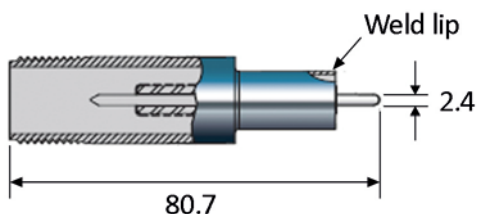
SHV 20 kV, single ended, grounded shield, exposed insulator, weldable



SHV 10 kV, single ended, grounded shield, recessed insulator, weldable

BSHV CONNECTORS

STYLE	NB OF PINS	VOLTAGE DC (kV)	CURRENT (A/PIN)	PIN Ø (mm)	WELD LIP OD (mm)	MATERIAL		
						HOUSING	INSULATION	PIN
Single Ended Grounded Shield	1	7.5	16.5	2.4	12.57	SS 304	Alumina ceramic	Ni

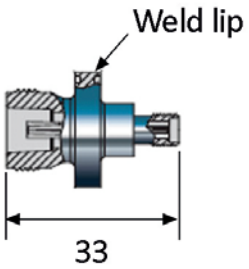


BSHV 7.5 kV, single ended, grounded shield, weldable

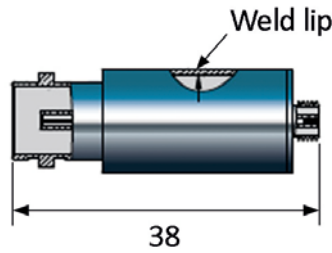
OTHER CONNECTORS

STYLE	NB OF PINS	VOLTAGE DC (kV)	CURRENT (A/PIN)	WELD LIP OD (mm)	MATERIAL		
					HOUSING	INSULATION	PIN
Type N to SMA 50 Ohm High Frequency	1	1.5	1	22.1	SS 304	Glass-Ceramic	Inconel X-750
BNC to Microdot	1, 2, 3, 4	0.5	5	12.6	SS 304	Glass-Ceramic	SS 330

All dimensions are in mm.



Type N to SMA, 50 Ω, high frequency, weldable



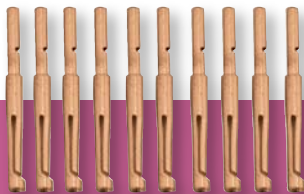
BNC to Microdot, weldable

ACCESSORIES

CONTACTS

Crimp type female contacts

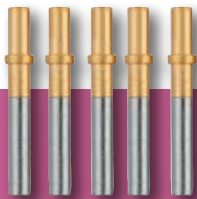
ACCEPTS PIN Ø (mm)	CURRENT (A)	TEMPERATURE RANGE (°C)	MATERIAL
0.81	16	-269 to 200	BeCu
1.0	15	-200 to 200	Cu Alloy - Au flash
1.1	2	-269 to 450	SST - Au plated
1.3	20	-269 to 200	BeCu
1.6	10	-269 to 400	Ni alloy
1.6	20	-269 to 200	BeCu



BeCu crimp contacts (Ø 0.81)



BeCu crimp contacts (Ø 1.6)



Cu alloy - Au Flash crimp contacts (Ø 1.0)

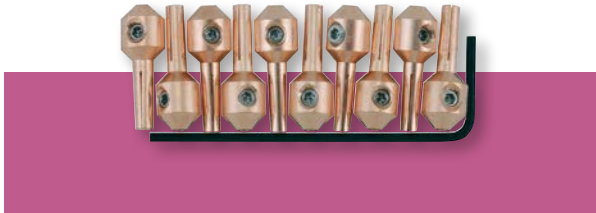
Other accessory: Crimp Tool
(for 0.64 - 1.90 mm Crimp Ø)



All dimensions are in mm.

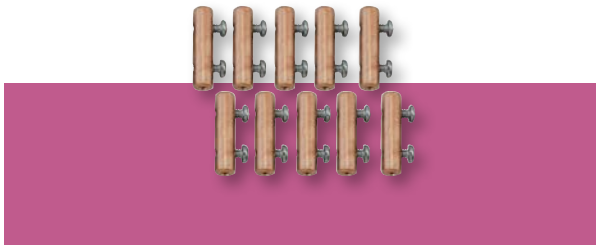
Set screw type contacts

SOCKET ACCEPTS Ø PIN (mm)	CURRENT (A)	TEMPERATURE RANGE (°C)	MATERIAL
1	20	-269 to 200	BeCu
1.3	25		
2.4			



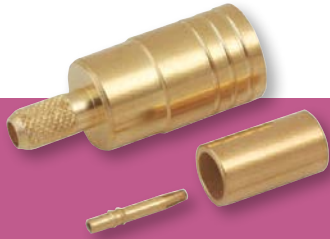
Barrel type contacts

MAX WIRE Ø (mm)	CURRENT (A)	TEMPERATURE RANGE (°C)	MATERIAL
1	13	-269 to 400	BeCu
1.3	20		
1.6			
2.4	25		
6.4	35		



AIR SIDE PLUG

Type	VOLTAGE DC (kV)	CURRENT (A)	TEMPERATURE RANGE (°C)
SMB Plug: Air Side	0.375	5	-65 to 165
SMA Plug: Air Side	0.5	5	
BNC Plug: Air Side	0.5	5	
MHV Plug: Air Side	5	10	
Type N Plug: Air Side	1.5	5	-55 to 165
HN Plug: Air Side	7	10	
BSHV Plug: Air Side	7.5	8	-65 to 400
SHV- 5 kV Plug: Air Side	5	10	-65 to 165
SHV- 10 kV Plug: Air Side	10	10	-65 to 85
SHV- 20 kV Plug: Air Side	20	20	-20 to 125



Air side plug for SMB connector



Air side plug for SMA connector



Air side plug for BNC connector



Air side plug for SHV connector

AIR SIDE CABLES

TYPE	CABLE TYPE	CABLE LENGTH (m)	VOLTAGE DC (kV)	Conductor (A)	TEMPERATURE RANGE (°C)
Microdot - Single Ended	RG196A/U	3	1	2	-65 to 125
50 Ohm SMB - Double Ended	RG188A/U		0.5	2	-70 to 200
50 Ohm SMA - Double Ended	RG174/U		0.5	5	-45 to 75
50 Ohm BNC - Double Ended	RG58C/U		0.5	5	-40 to 85
52 Ohm MHV - Double Ended	RG8A/U		5	10	-55 to 85
50 Ohm Type N - Double Ended	RG223/U		1.5	5	-40 to 60
52 Ohm SHV - Double Ended	RG8A/U		5	10	-40 to 85



Air side cable assembly for Microdot connector

VACUUM SIDE CABLE ASSEMBLY

TYPE	CABLE LENGTH (mm)	CURRENT CONDUCTOR (A)	VOLTAGE DC (kV)	TEMPERATURE RANGE (°C)	MATERIAL CONDUCTOR
Microdot Vacuum Side - Double Ended	304.80 609.60 914.40	2	0.5	-65 to 125	Ag plated Cu

Thermocouples

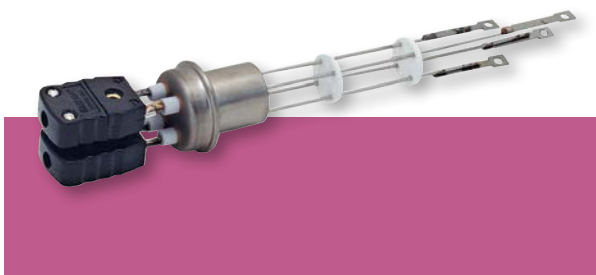
Thermocouples are widely used to measure the temperature inside a vacuum or pressure chamber. Thermocouple feedthroughs, manufactured with thermocouple materials or compensating material, transmit through the wall of the chamber the electromotive force (emf) generated by the application of heat to the thermocouple bead without introducing error. External instrumentation can then evaluate the strength of the emf that is proportional to the temperature at the thermocouple bead, thus yielding a temperature measurement. The thermocouple feedthrough provides the necessary electrical isolation and a hermetic seal.

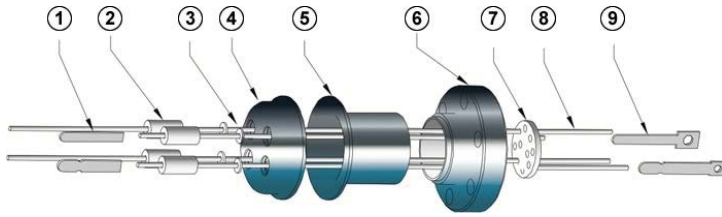
For refractory and noble metal thermocouples Neyco uses compensating wires. The joints between the compensating material and the true thermocouple conductor material must be thermally shielded and not exceed 250° C. Observe the maximum temperatures stated in footnotes for the part chosen. A Thermocouple Application Chart is shown on the next page.

MATERIALS AND PROCESSES

Thermocouples use only inorganic materials. The insulators are high-purity, high-strength, low-loss alumina ceramics. Hardware metals include Kovar®, Stainless Steel, Nickel, Copper, Nickel-Iron alloys, Cupro-Nickel alloys and Molybdenum. Conductor materials and contacts include Chromel®, Alumel®, Alloy 405, Alloy 426, Alloy 11, Copper, Constantan® and Iron. Compensating wires, Alloy 11, Copper, Alloy 405 and Alloy 426 are utilized in types C, R and S feedthroughs.

Braze materials include Silver, Copper, Silver-Copper and Gold-Copper alloys. Metallization processes include both refractory-metal and active-metal metallizations, dependent upon size, geometry and performance requirements for the seals. Advanced techniques for control of special and critical processes are used, including 100 percent Helium leak testing, and X-ray measurements for metallization control.





- (1) Contact
- (2) Insulator
- (3) Shims
- (4) Cap
- (5) Adapter
- (6) Flange
- (7) Spacer
- (8) Conductor
- (9) Contact

Typical Thermocouple Construction

STANDARD SPECIFICATIONS

- Temperature Range: cryogenic -269°C to 450°C
- Internal pressure from 10⁻¹⁰ mbar to 3.500 psig
- Thermocouple Type C, E, J, K, R, S, T
- Single to 20 pairs
- Leak rate (He): < 1.10⁻¹⁰ mbar.l.s⁻¹

EXTREME / CUSTOM DESIGN

- 940-pin feedthrough using thermocouple materials
- Sub D connectors using thermocouple materials
- Single pair high-temperature cable end seal in a special plug design

INSTALLATION

Standard installation mountings include:

- Weld (Pulse-TIG, TIG, Laser, E-Beam)
- KF, ISO and CF flanges

APPLICATIONS

A few of the many applications in which these thermocouples are commonly used are:

- Furnaces
- Power generation measurement and control
- Aerospace equipments
- In-vacuum coating
- Semi-conductor processing equipments
- Energy research
- Industrial equipments

SELECTING THE RIGHT THERMOCOUPLE

To select the right thermocouple for your applications, you should consider:

- Number of thermocouple pairs
- Operating temperature
- Installation
- Plug requirements, single- or double-ended
- Dimensional characteristics
- Other specific considerations, e.g., non-magnetic, cryogenic, etc.

THERMOCOUPLE APPLICATION CHART

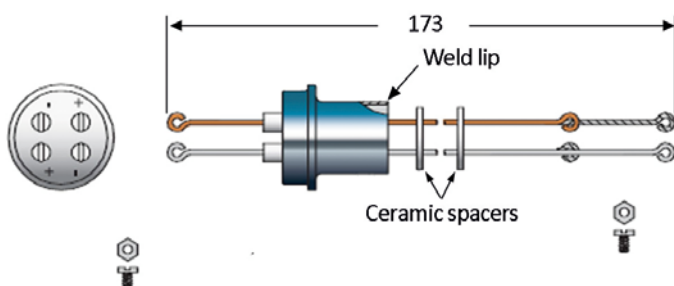
ANSI TYPE	THERMOCOUPLE (POLARITY +/-)	TEMPERATURE RANGE (°C)	EMF (MV)
T	Copper/Constantan	-200 to 350	-5.60 to 17.82
K	Chromel/Alumel	-200 to 1250	-5.9 to 50.63
J	Iron/Constantan	0 to 750	0 to 42.28
S	Platinum - 10% Rhodium/Platinum	0 to 1450	0 to 14.97
R	Platinum - 13% Rhodium/Platinum	0 to 1450	0 to 16.74
C*	Tungsten - 5% Rhenium/Tungsten - 26% Rhenium	0 to 2315	0 to 37.06
E	Chromel/Constantan	-200 to 900	-8.82 to 68.78

*Not an ANSI symbol.

TYPE	V DC	TEMPERATURE RATING				NUMBER OF PAIRS	CONNECTION TYPE	THERMOCOUPLE TYPE
		THERMOCOUPLE		AIR SIDE PLUG				
		MIN	MAX	MIN	MAX			
Loop yype	NA	-269	450	-	-	Single, 1, 2	-	R, S, T
Spade type	NA	-269	450	-73	650	Single, 1, 2, 3, 5	Air side plug	C, K
Spade & power	5 kV	-269	450	-73	650	1 Pair, 2 conductors	Air side plug/ Contacts	C, K
MIL-C-5015 Type	NA	-269	450	-55	125	3, 5, 10	Air side plug/ Contacts	K

LOOP TYPE

TYPE	TOTAL LENGTH (mm)	WELD LIP OD (mm)	MATERIAL		
			SHELL	INSULATION	THERMOCOUPLE
Single conductor	153	6.27	SS 304	Alumina ceramic	Copper
	178				Constantan Platinum-Rhodium
1 pair	127/152	18.97			Copper / Constantan (type T) Platinum-Rhodium (type R/S)
2 pairs	147/173				

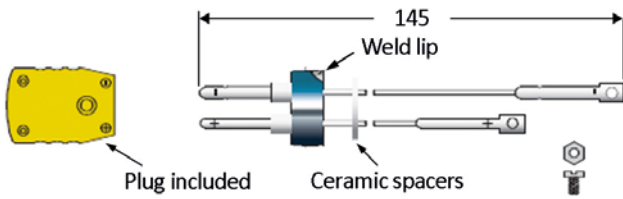


Loop type: two pairs, weldable

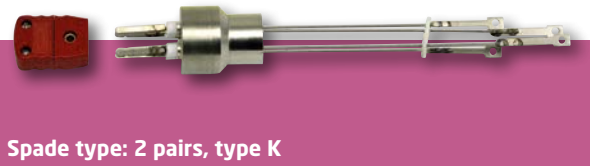
SPADE TYPE

TYPE	TOTAL LENGTH (mm)	WELD LIP OD (mm)	MATERIAL		
			SHELL	INSULATION	THERMOCOUPLE
Single conductor	142 & 149	6.27	SS 304	Alumina ceramic	Chromel
	168 & 174				Alumel
1 pair	119/145	18.97			Chromel / Alumel (type K) Tungsten-Rhenium (type C)
2 pairs	140/165				
3 or 5 pairs	140/152		Chromel / Alumel (type K)		

All dimensions are in mm.



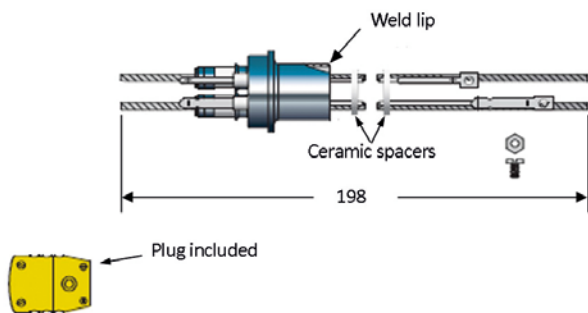
Spade type: single pair, weldable



Spade type: 2 pairs, type K

SPADE & POWER

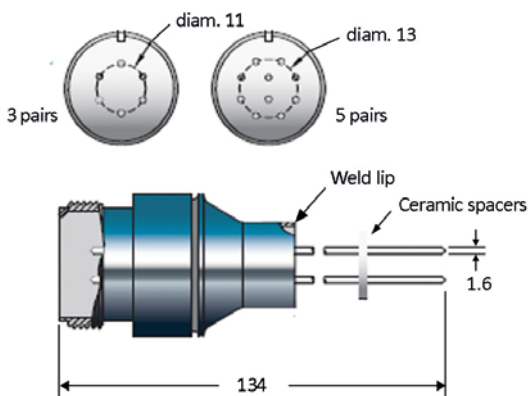
VOLTAGE DC (kV)	CURRENT (A / PIN)	LENGTH (mm)	WELD LIP OD (mm)	MATERIAL			
				SHELL	INSULATION	THERMOCOUPLE	PINS
5	16.5 (Ni) 55 (Cu)	/165	18.97	SS 304	Alumina ceramic	Chromel/Alumel (type K) Tungsten-Rhenium (type C)	Ni Cu



Spade & Power type: weldable

MIL-C-5015 TYPE

TYPE	LENGTH (mm)	WELD LIP OD (mm)	MATERIAL		
			SHELL	INSULATION	THERMOCOUPLE
3, 5, 10 pairs	134	18.97	SS 304	Alumina Ceramic	Chromel/Alumel (Type K)



MIL-C-5015 type: 3 & 5 pairs, weldable

All dimensions are in mm.

ACCESSORIES

CONTACTS

Crimp type female contacts

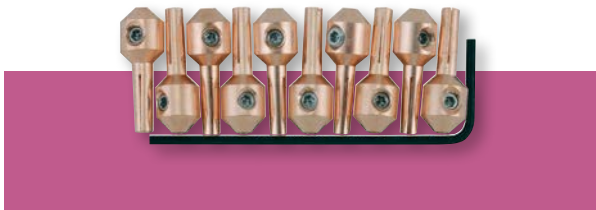
ACCEPTS Ø PIN (mm)	TEMPERATURE RANGE (°C)	MATERIAL
1.6	-269 to 350	Chromel
		Alumel

Other accessory: Crimp Tool
(for 0.64 - 1.90 mm Crimp Ø)



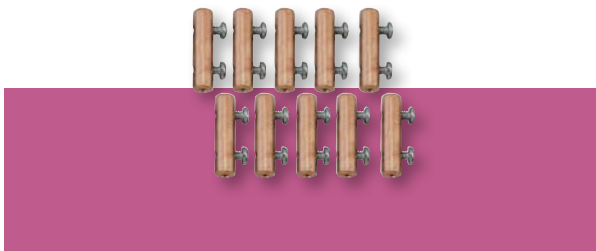
Set screw type contacts

SOCKET ACCEPTS Ø PIN (mm)	CURRENT (A)	TEMPERATURE RANGE (°C)	MATERIAL
1.3	25	-269 to 200	BeCu



Barrel type contacts

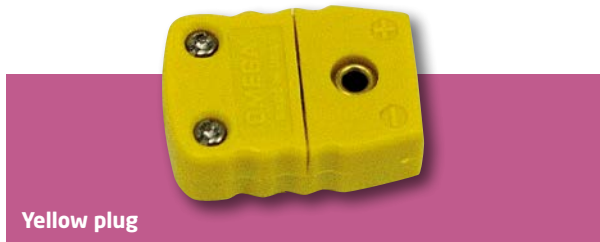
MAX WIRE Ø (mm)	CURRENT (A)	TEMPERATURE RANGE (°C)	MATERIAL
2.4	25	-269 to 400	BeCu



PLUGS FOR THERMOCOUPLE CONNECTORS

Spade type

THERMOCOUPLE	TYPE	PLUG MATERIAL	TEMPERATURE RANGE (°C)	COLOR CODE
Chromel/Alumel (type K)	Standard	Glass Filled Nylon	-29 to 218	Yellow
	High Temp	Ceramic	-73 to 650	
Tungsten- Rhenium (type C)	Standard	Glass Filled Nylon	-29 to 218	Red
	High Temp	Ceramic	-73 to 650	



MIL-C-5015 type

THERMOCOUPLE	T/C PAIRS	TEMPERATURE RANGE (°C)
Chromel/Alumel (type K)	3, 5 & 10	-55 to 125

Thermocouple extended range MIL-C-5015 type

TYPE	VOLTAGE DC (kV)	QTY	Current (A)	TEMPERATURE RANGE (°C)	MATERIAL
Extended range - Teflon	0.7	4, 6 & 10	4.8	-65 to 200	Alumel
		2, 3 & 5 pairs	-		Chromel/Alumel
Extended range - PEEK*		4, 6 & 10	4.8	-55 to 260	Alumel
		2, 3 & 5 pairs	-		Chromel/Alumel

*PEEK : Polyetheretherketone.

Electrical Isolators

Electrical isolators consist of metal sleeves brazed to each end of an insulating ceramic tube. These assemblies provide electrical isolation of system components that operate within a common environment. They can also be used to provide a conduit to introduce gases or liquids into hermetic systems.

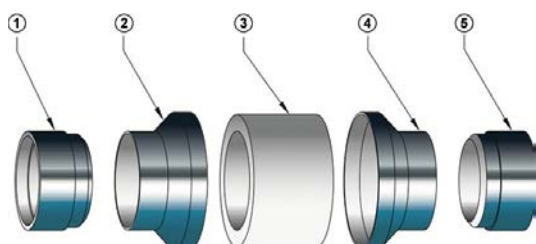
- Cryogenic isolators are used to introduce cryogenic fluids into a system and to provide electrical isolation of line components.
- Water isolators are used to introduce water or other fluids into a system and to provide electrical isolation of line components.
- Vacuum isolators are used to provide an electrical break between the vacuum system and other external components.

MATERIALS AND PROCESSES

Isolators use ceramic insulators that are 90% alumina oxide or better. The metal hardware is generally a controlled-expansion Nickel-Iron alloy, 304 Stainless Steel or Copper.

The assemblies are brazed together using Copper, Gold-Copper or Silver-Copper alloys.

Advanced techniques for control of special and critical processes, including 100 percent Helium leak testing and X-ray measurements for metallization control are used.



Typical Isolator Construction

- (1) Adapter
- (2) Sleeve
- (3) Insulator
- (4) Sleeve
- (5) Adapter

STANDARD SPECIFICATIONS

- Voltages up to 75 kV DC
- Bake out to 450°C
- Operating Temperature
 - Cryogenic isolators: -269°C to 450°C
 - Water isolators: 0°C to 100°C
 - Vacuum isolators: -55°C to 450°C (magnetic materials), -269°C to 450°C (no magnetic materials), KF flange -25°C to 205°C
- Insulator IDs up to 203.20 mm
- Internal pressure: 1.10^{-10} mbar to 1000 psig
- Leak rate (He): $< 1.10^{-10}$ mbar.l.s⁻¹

INSTALLATION

Standard installation mountings include:

- Weld (Pulse-TIG, TIG, Laser, E-Beam)
- KF, ISO and CF flanges

APPLICATIONS

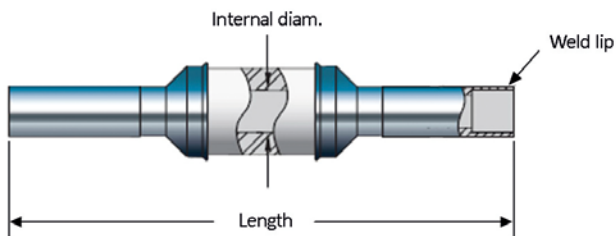
A few of the many applications in which these isolators are commonly used are:

- Semi-conductor processing equipments
- Particle accelerators
- Furnaces
- Analytical equipments
- Beam line tubes
- Aerospace
- Telecommunications

TYPE	MAX. VOLTAGE DC	PRESSURE RATING	TEMPERATURE RANGE (°C)	ISOLATOR ID (mm)
Cryogenic	6, 13 kV	27 to 68 bar	-269°C to 450°C	2.8 to 10
Water	5 kV	13 to 30 bar	0°C to 100°C	6.6 to 12.9
Vacuum	6 to 75 kV	5 to 61 bar	-269°C to 450°C	7.8 to 203.2

CRYOGENIC ISOLATORS

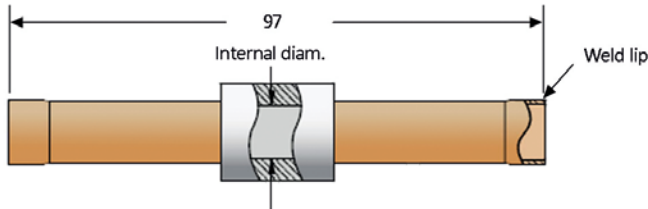
VOLTAGE DC (kV)	LENGTH (mm)	WELD LIP OD (mm)	INTERNAL Ø (mm)	MATERIAL		
				TUBE	CAP	INSULATION
6	43	3.18	2.7	SS 321	42 NiFe	Alumina ceramic
13	78	6.35	6.4	SS 304		
	76	6.40				
	76	9.58	10			



All dimensions are in mm.

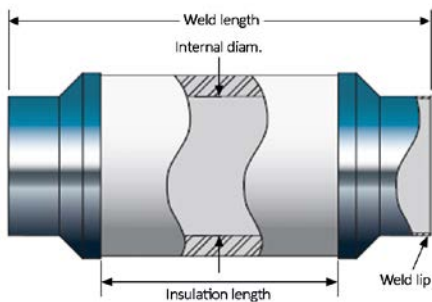
WATER ISOLATORS

VOLTAGE DC (kV)	WELD LENGTH (mm)	WELD LIP OD (mm)	INTERNAL Ø (mm)	MATERIAL	
				TUBE	INSULATION
5	97	Braze or solder	8.1	Cu	Alumina ceramic
			11		
			14		



VACUUM ISOLATORS

VOLTAGE DC (kV)	LENGTH (mm)		WELD LIP OD (mm)	INTERNAL Ø (mm)	MATERIAL	
	WELD LENGTH (mm)	INSULATION LENGTH (mm)			TUBE	INSULATION
15	40	19	12.90	7.9	Kovar	Alumina ceramic
30	66	38	30.48	23		
40	86	51	60.33	51		
6	48	6.3	19.00	19	SS	
20	67	25				
35	92	51				
5	49	4	31.75	32	Kovar or SS 304	
35	96	50				
65	144	99				
20	95	22.8	71.12	64	Kovar or 52 NiFe	
60	111	76				
	165	92.7				
20	95	22.8	101.6	102	52 NiFe	
60	165	92.7				
30	114	38				
55	152	76	152.7	152		
75	191	114				
30	121	38				
55	159	76	203.5	203		
75	197	114				



All dimensions are in mm.

Fiber Optics Feedthroughs

Fiber optic feedthroughs are constructed with 62.5, 100, 200, 400, 600, and 1000 μm UV/VIS*, VIS/NIR**, or Graded-index multimode fibers. They are designed for vacuum applications requiring fiber optic connections from inside a vacuum system to external equipment. The fiber is hermetically sealed into a Stainless Steel shell, using the latest in glass-ceramic bonding technology, and terminates on the vacuum and air side with standard SMA 905 connectors.

Ultra-high vacuum cable, polyimide buffered 200, 400, and 600 μm optical fibers are available to meet the demands of ultra-high vacuum environments. 1000 μm vacuum fiber optic cable has an aluminum buffer.

All Neyco's optical fiber is constructed as a core-and-cladding composite. The core, or the filament that guides the light, consists of a thin strand of high-transmission fused silica. The cladding consists of an outer layer of doped, lower-refractive-index fused silica. This two-layer design tightly confines the light to the central core of the fiber which in turn delivers a maximum amount of light at the far end. The fiber diameter is closely controlled during the drawing process. This allows the fiber to center well in connectors. A low loss rate is the result.

*UV/VIS: a range specifying Ultra-violet to Visible wavelength.

**VIS/NIR: a range specifying Visible to Infrared wavelength.

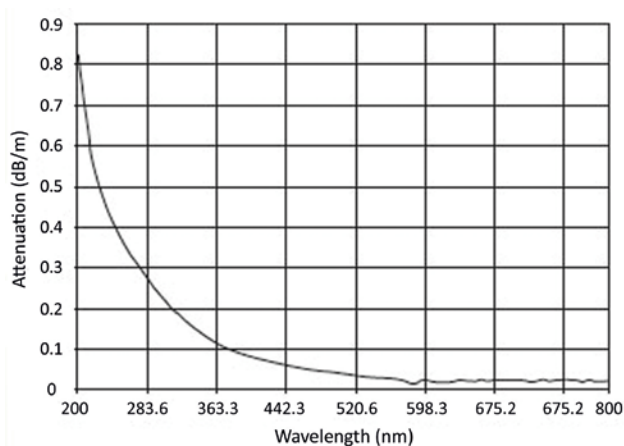
SPECIFICATIONS

- Vacuum range: 1.10^{-10} mbar (CF flange) / 1.10^{-8} mbar (KF flange & bolt style)
- Connector type: SMA
- Temperature range:
 - Feedthrough: -200°C to $+250^{\circ}\text{C}$
 - CF flange: -200°C to $+450^{\circ}\text{C}$
 - KF flange and bolt style: 150°C
- Thermal gradient: $25^{\circ}\text{C}/\text{min}$ max.
- Optical fiber
 - Bare fiber: pure fused-silica core, fluorine doped silica cladding, polyimide buffer
 - Insertion loss of interconnects: -0.8 dB to -2.0 dB (UV/VIS or VIS/NIR)
 - Attenuation (Graded-index): ≤ 3.0 dB at 850nm
 ≤ 0.8 dB at 1300 nm

	OPERATING WAVELENGTH (nm)	FIBER PROFILE	NUMERICAL APERTURE	BEND RADIUS	
				MOMENTARY	LONG-TERM
UV/VIS or High-OH fiber	200-800	Step-index multimode	0.22 ±0.02 or 24.8°	200 x core Ø	400 x core Ø
VIS/NIR or Ultra Low-OH fiber	400-2200				
Graded-index fiber	850 & 1300	Graded-index multimode	0.27 ±0.02 or 31.3°	400 x core Ø	800 x core Ø

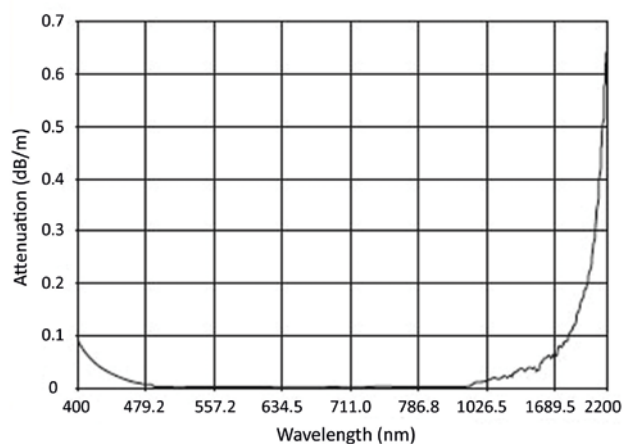
INSTALLATION

- KF and CF flanges
- 0.312" bolt



UV/VIS Fiber Attenuation Curve, 200-800 nm




- Intended for UV and UV/VIS applications only.
- Recommended in lengths less than 15-m to avoid high attenuation.



VIS/NIR Fiber Attenuation Curve, 400-2200 nm*

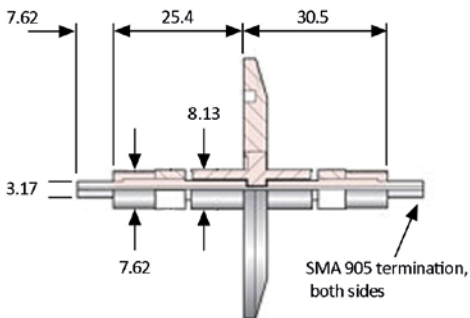
- Provides the lowest possible internal light attenuation.
- Useful for VIS or VIS/NIR applications requiring extremely long fiber lengths.

*Some absorption occurs at 1400 nm.

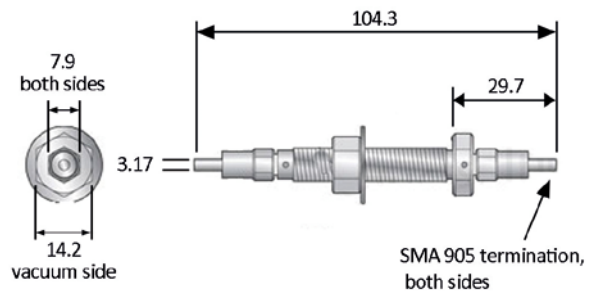
	NB OF FIBERS	FLANGES	Ø FIBER UV / VIS VIS / NIR	Ø FIBER GRADED- INDEX	MATERIAL
	1	16 KF, 40 KF Bolt style 16 CF, 40 CF	100 µm 200 µm 400 µm 600 µm 1000 µm		
	2	40 KF 40 CF		62.5 µm core 125 µm clad	SS, glass, fused Silica
	4*	40 KF 40 CF	100 µm 200 µm 400 µm 600 µm		

*Not available for Graded-index fiber optic feedthrough.

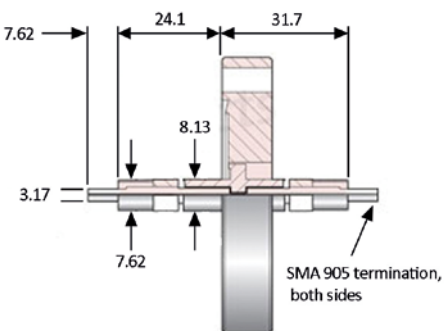
DIMENSIONS



KF flange feedthrough








Bolt style feedthrough



CF flange feedthrough

All dimensions are in mm.

ACCESSORIES

Fiber optic UHV cable assemblies	Connector to connector	Length = 482 mm or 990 mm	
	Connector to cable	Length = 2006 mm	
Air-service multimode fiber optic cable assemblies	Connector to connector		
In-vacuum SMA coupler	With vent hole		
Air-side SMA coupler	Without vent hole		
Cable rack	Narrow or wide slot		

“Connector” UHV fiber optic cable assemblies are fitted with SMA 905 connector on end of a “non-jacketed” fiber optic fiber. In option: PEEK*, Stainless Steel, or Silver plated braid jacketing.

*PEEK : Polyetheretherketone.

In-Vacuum Wiring & Wiring Accessories

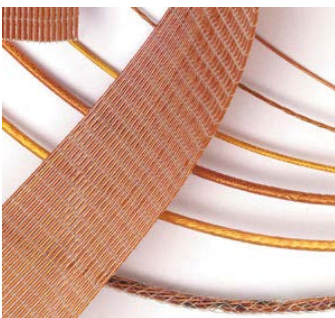
IN-VACUUM WIRING

Our in-vacuum wiring is designed for high and ultra-high vacuum environments to 1.10^{-10} mbar and are bake-able to 250°C. All conductors and shielded coaxial cable shielding are constructed with Silver plated Copper wire.

Insulation is a high mechanical strength Kapton Type-F film that is applied and heat treated to minimize trapped gases.







Multi-conductor cables are available in either flat ribbon or circular configuration with an outer PEEK* monofilament weave. Round cable bundles are color-coded for ease of wiring. For non-coded wires, Neyco offers colored glass identification beads in six easy to distinguish colors.




*Polyetheretherketone.



SPECIFICATIONS

- Vacuum range: 1.10^{-10} mbar
- Temperature range: -75°C to 250°C
- Material
 - Conductor: Ag-plt Cu
 - Insulation: Kapton Type-F film
- Kapton properties
 - Dielectric constant: 2.9
 - Dielectric strength: 80 kV/mm
 - Dissipation factor, 1 MHz: 0.002
 - Radiation resistance: 10^9 Rads
 - Moisture absorption: 0.4% at 50% RH

TYPE	WIRE			NB STRANDS	INSULATION Ø (mm)	RESISTANCE AT 20°C (Ω / Km)	CURRENT RATING (A)	MIN. BEND RADIUS	
	NB	LENGTH (m)	Ø (mm)						
Fine instrument wire	1	9.1	0.15	1	0.165	-	0.25	0.1	
Solid wire	1	9.1	0.25 0.4 0.5 0.6	1	0.5 0.63 0.76 0.86	377 146 88.3 64.3	1.5 3 4 5.5	0.15 0.16 0.16 0.16	
Stranded wire	1	9.1	0.127 0.152 0.203	7	0.5 0.63 0.76	244 159 88.3	2 3 4	0.13 0.13 0.28	
	1	9.1	0.127 0.178	19	0.89 1.09	58.6 32.5	6 8	0.25	
	1	4.5	0.008 0.254 0.279 0.381	19	1.29 1.52 1.65 2.16	20.6 14.3 11.4 6.2	11 14 16 25	0.35 0.35 0.48 0.58	
High voltage wire	1	4.5	0.15	7	1.57	159	3	0.55	
Multi-conductor ribbon cable	9 15 19 25	0.48/ 1/2.4	0.127	7	0.81	244	2A/cond	0.53	
	2 x 25							0.88	
Multi-conductor round cable	9	0.48/ 1/2.4	0.127	7	0.635	244	-	0.35	


TYPE	WIRE		NB STRANDS	JACKET Ø (mm)	SHIELD Ø (mm)	INTERNAL INSULATION Ø (mm)	RESISTANCE AT 20°C (Ω / Km)	CURRENT RATING (A)	MIN. BEND RADIUS	
	LENGTH (m)	Ø (mm)								
Coaxial shielded cable	9.1	0.25	1	-	0.96	0.5	377	1.5	0.23	
	4.5	0.2	7	1.27	1.17	0.8	88.3	4.5	0.5	
50 Ohm coaxial cable	4.5	0.038 1.10 1.15	7	1.27 1.7 2.28	1.04 1.47 2.00	0.73 1.19 1.57	558 353 159	0.5 1.5 3	0.2 0.23 0.53	

ACCESSORIES

PEEK Terminal Blocks are ideal for UHV environments with a current rating of 10 A per pole. Constructed with a 1, 2, or 4 pole design, these unique blocks can be mounted side by side, or stacked to create an unlimited combination of connector terminals. The body is made with PEEK (polyetheretherketone) and the internal connectors are Gold plated Beryllium-Copper with Stainless Steel set screws. Each block has two through holes for secure mounting and stacking.

SPECIFICATIONS


- Vacuum range: 1.10^{-10} mbar
- Operating temperature: 250°C

	NB POLES	CONDUCTOR Ø (mm)	A	L x W x H (mm)	
PEEK Terminal Blocks	1 2 4 8	1.83 max.	10 max.	14 x 14 x 8.9 20.3 x 14 x 8.9 33.5 x 14 x 8.9 67 x 14 x 8.9	

Ceramic Beads are for use in insulating bare wires in air or vacuum systems. The beads are bakeable to 450°C and manufactured using high purity L3 Steatite. The convex and concave ends stack easily on the wire and interlock to provide a flexible and continuous insulation along the entire length of wire.

SPECIFICATIONS



- Vacuum range: 1.10⁻¹⁰ mbar
- Operating temperature: 450°C
- Packaging: per 300 linear mm

	APPROXIMATE NB OF BEADS	LENGTH (mm)	O.D. (mm)	I.D. (mm)	ACCEPTS WIRE Ø (mm)	
Ceramic beads	85	4.3	4.3	1.7	1.27	
	75	5.1	5.1	2.5	2.16	
	55	0.26	0.26	4	3.25	

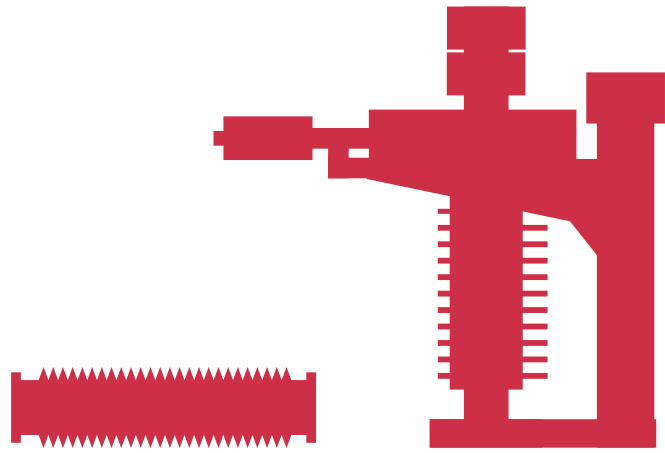
PEEK Cable/Equipment Ties and Shrink tubing are ideal for ultra-high vacuum, high temperature, and harsh chemical environments. The uses for these PEEK cable ties are virtually unlimited. PEEK Shrink Tubing is considered the highest performing thermoplastic material due to its ability to withstand extreme temperatures to 250°C, high pressure, and chemical fluids. PEEK shrink tubing provides a “shrink to fit” layer of protection for critical components and wiring used in UHV applications.

SPECIFICATIONS

- Vacuum range: 1.10⁻¹⁰ mbar
- Operating temperature: 250°C (cable ties), 340°C to 385°C (heat shrink tubing)

	PACKAGING QTY	LENGTH (mm)	WIDTH (mm)	THICK. (mm)	STARTING I.D.	RECOVERED I.D.	
PEEK* Cable Ties	10	188	4.8	1.4	-	-	
PEEK Shrink Tubing	1	152.4	-	-	2.4	1.7	
					3.2	2.6	
					4.8	4	
					6.5	4.8	

*PEEK : Polyetheretherketone.



VACUUM BELLOWS & MOVEMENT FEEDTHROUGHS

- Hydroformed Bellows K 02
- Welded Bellows K 04
- Rotary / Linear Motion Feedthroughs KF K 05
- Linear Motion Feedthroughs CF K 06
- Rotary Feedthroughs KF/ISO K K 08
- Rotary Feedthroughs CF K 10
- DPRS Series Differentially Pumped Rotary Seals .. K 12
- Z Series Linear Translators K 14
- Manipulators K 15

Hydroformed Bellows

Neyco provides bellows, which have adjustable elasticity, bendability and high hermeticity. Our hydroformed bellows are used under various conditions from vacuum to high pressure, from low to high temperature, and in various parts of machines such as control and movement parts related to all kinds of fluids.

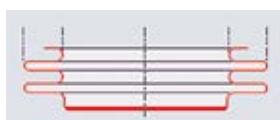
Material: Stainless Steel 304L, 316L (other materials on request).



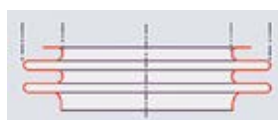
DIMENSIONS

- O.D.: from 8 to 200 mm
- Membrane thickness: from 0.1 to 0.4 mm (according to O.D.)

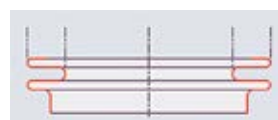
END SHAPES



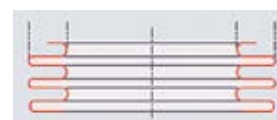
Type T: Closed end



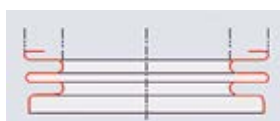
Type B: O.D. of end is almost the same as I.D.



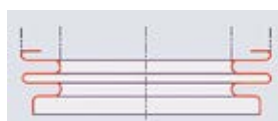
Type F: O.D. of type B's end < O.D. of end



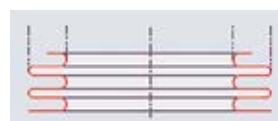
Type D



Type A: O.D. of end is almost the same as O.D.



Type C: I.D < O.D. of end < O.D. of type A's end



Type E



Adjustable flexible connector with CF flanges



Hydroformed bellows on KF flanges

Our hydroformed bellows are mostly used for minor adjustments lengths, mainly in compression. They are also known as tombacs and enable full angular adaptations.

Available with KF, ISO and CF flanges, bellows are used in all pumping systems (ie from primary to secondary pump). Lengths upon request, or according to customer's drawing.

➡ See Section D - KF Components in this catalogue about standard bellows and hoses with KF flanges.

➡ See Section E - ISO Components in this catalogue about standard bellows and hoses with ISO flanges.

➡ See Section F - CF Components in this catalogue about standard bellows and hoses with CF flanges.



Welded Bellows

Edge welded bellows are flexible connecting elements between vacuum flanges or end fittings of any kind. The edge welded bellow is not a rigid body but can overcome a specified working stroke. Three main fields of application can be identified as feedthrough, as expansion joint or as vibration isolator.

Edge welded bellows serve as feedthrough to introduce movements into the vacuum or to separate the vacuum chamber from mechanical parts.

Edge welded bellow can be used as compensator to balance thermal expansion and mounting tolerances.

Edge welded bellows are often used for vibration decoupling e. g. between vacuum pump and measuring instrument.

Welded bellows are widely used for transfer with a Z travel both in compression and elongation. Angular adjustment is highly suitable as well.

Welded bellows are available in KF, ISO and CF flanges, fully low UHV compatible.

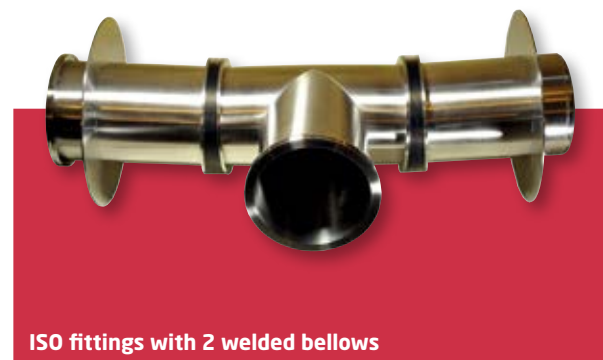
Lengths upon request, or according to customer's drawing.



Welded bellows with double rings fittings



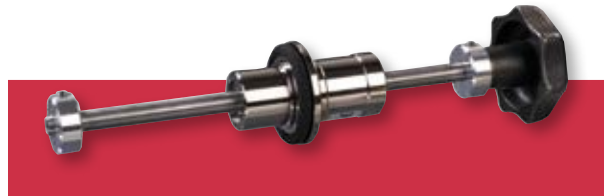
Welded bellows on KF flange



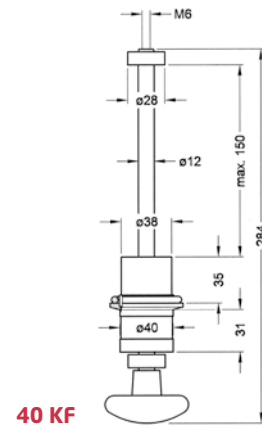
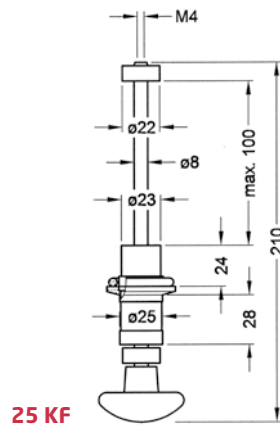
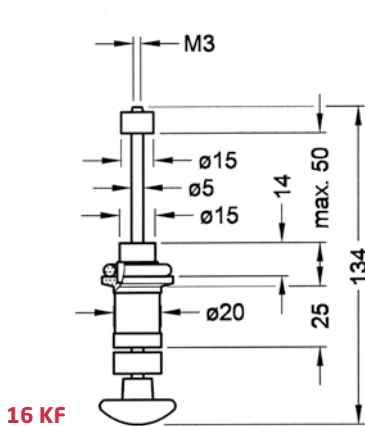
ISO fittings with 2 welded bellows

Rotary / Linear Motion Feedthroughs KF

- Two FPM shaft seals
- Direct push/pull and rotary actuation
- With locking ring and optional anti-rotation device



	UNIT	16 KF	25 KF	40 KF
Shaft connection		M 3/Ø 5 mm	M 4/Ø 8 mm	M 6/Ø 12 mm
Travel	mm	50	100	150
Shaft load: radial force at max.travel torsion torque	N Nm	10 2	15 8	30 20
Tightness, static	mbar.l.s ⁻¹	1.10 ⁻⁹		
Pressure		1.10 ⁻⁸ mbar to 1 bar		
Operating temperature	°C	50		
Bakeout temperature	°C	110		
Materials exposed to process media	-	SS 304 Aluminum 6063		

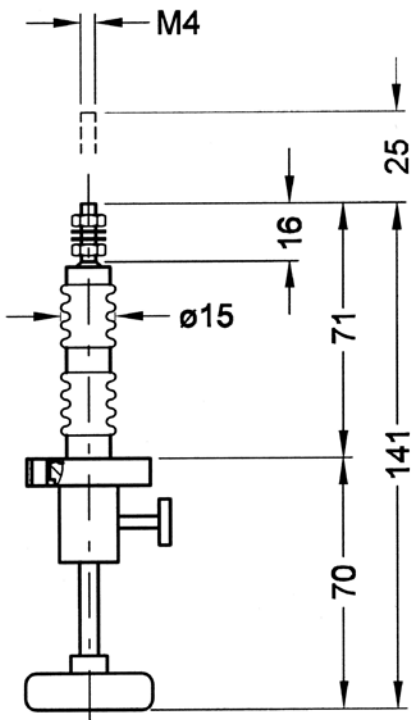


Linear Motion Feedthroughs CF

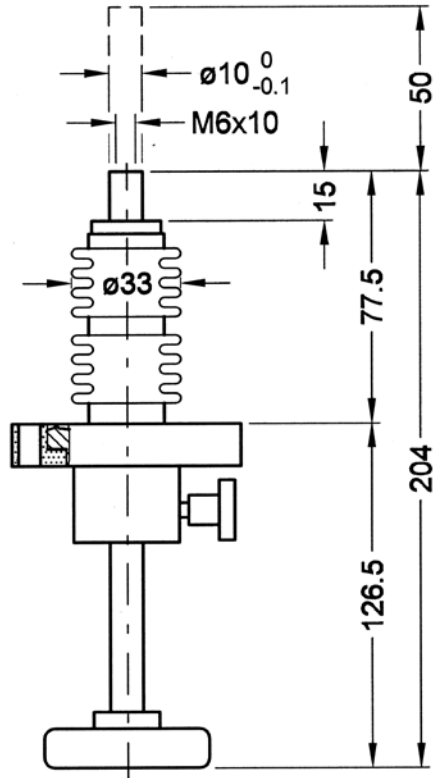
- With bellows for more demanding vacuum requirements
- Direct push and pull actuation
- High accuracy adjustment using micrometer screw



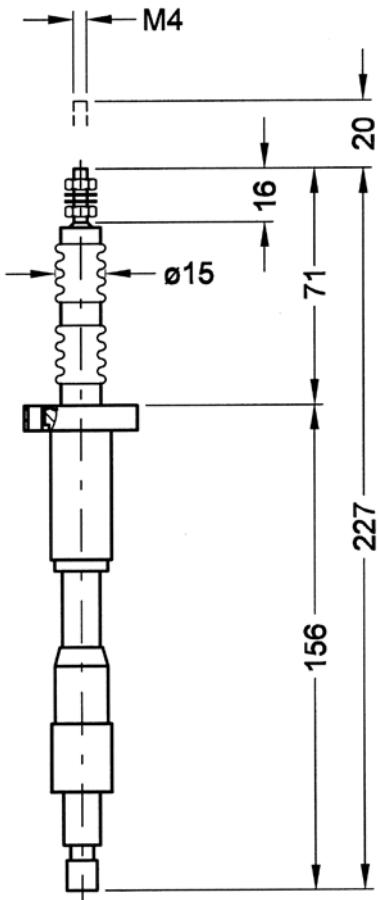
	UNIT	16 CF-R MANUAL	40 CF-R MANUAL	16 CF-R MICROMETER SCREW	40 CF-R MICROMETER SCREW
Shaft connection		M 4 x 16 mm	M 6 x 10 mm, Ø 10 mm	M 4 x 16 mm	M 6 x 10 mm, Ø 10 mm
Travel	mm	25	50	20	50
Shaft load:	radial force at max.travel	N	20	20	100
	axial force vacuum	N	85	185	440
	axial force against atm	N	100	200	500
	torsion torque	Nm	0.2	0.5	0.2
Tightness, static	mbar.l.s ⁻¹	5.10 ⁻¹¹			
Pressure		1.10 ⁻¹⁰ mbar to 2 bar			
Bakeout temperature:	Feedthrough	°C	300	300	300
	Micrometer screw	°C	-	-	100
Materials exposed to process	-	SS 304L SS 316Ti			



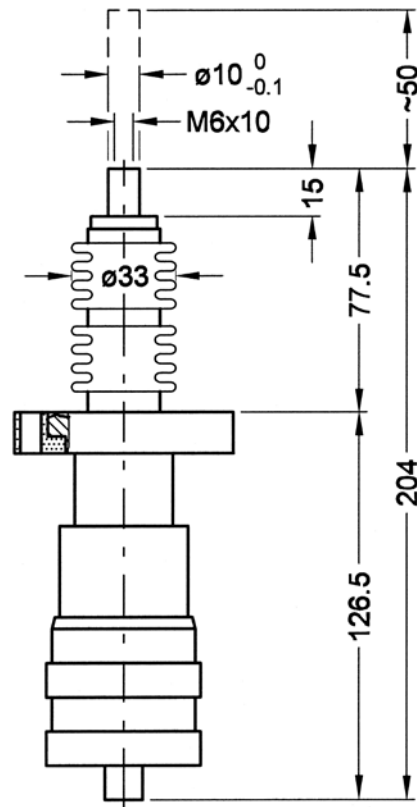
16 CF-R manual



40 CF-R manual



16 CF-R micrometer screw



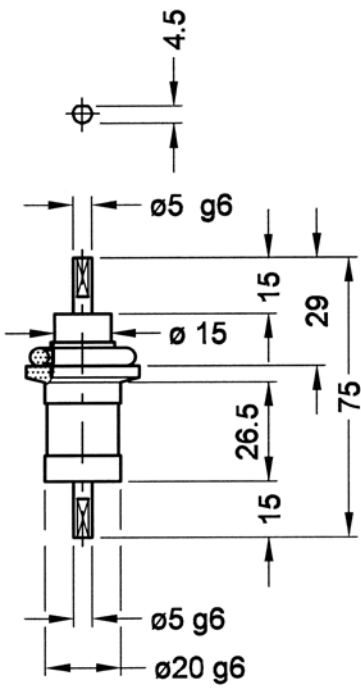
40 CF-R micrometer screw

Rotary Feedthroughs KF / ISO K

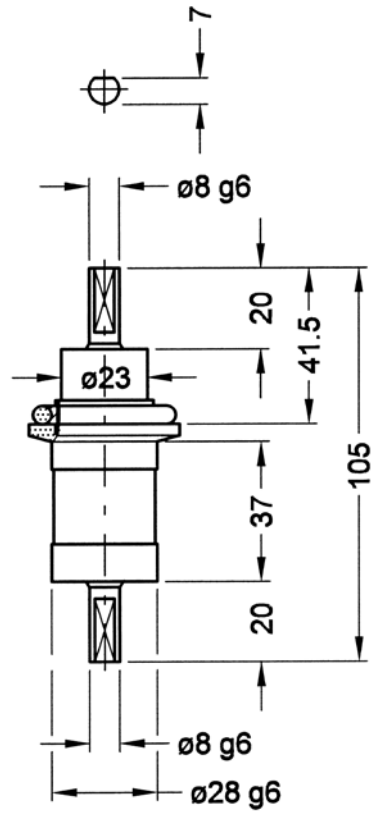
- For transmitting high torque
- With FPM shaft seal and ball bearings



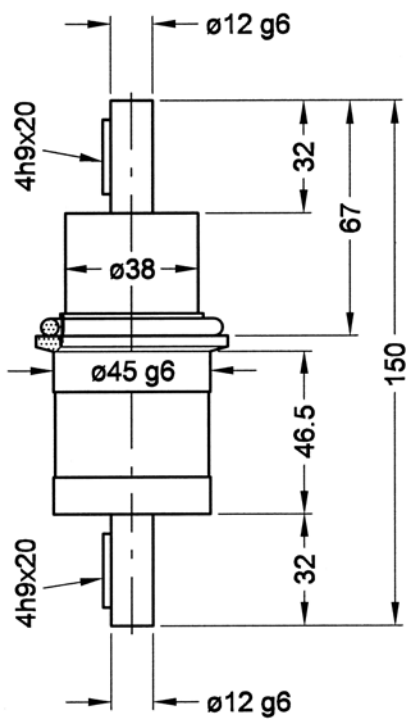
	UNIT	16 KF	25 KF	40 KF	63 ISO K
Shaft measure	mm	Ø 5	Ø 8	Ø 12	Ø 20
Transferable torque	Nm	1.5	6	25	100
Rotational speed	rpm	1500	1000	750	500
Shaft load: radial force axial force	N N	60 30	150 50	250 60	500 100
Tightness, static	mbar.l.s ⁻¹	1.10 ⁻⁹			
Pressure		1.10 ⁻⁹ mbar to 1 bar			
Operating temperature	°C	50			
Bakeout temperature	°C	110			
Materials exposed to process media	-	SS 420 Aluminum 6063 FPM			



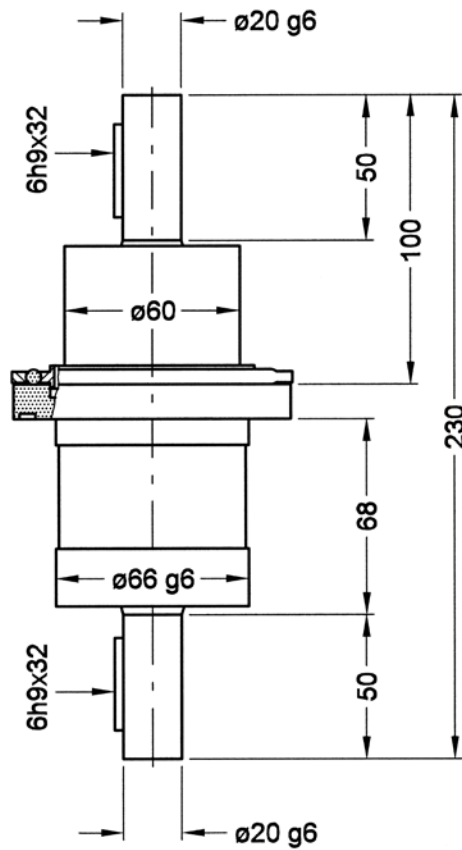
16 KF



25 KF



40 KF



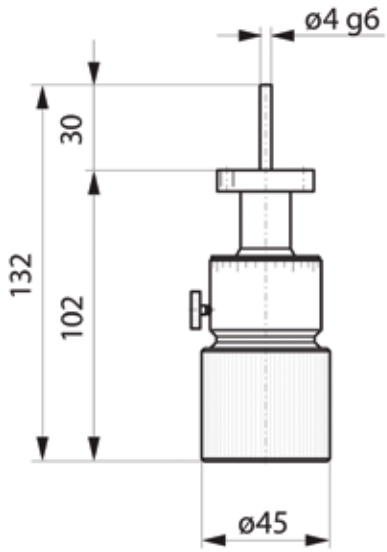
63 ISO K

Rotary Feedthroughs CF

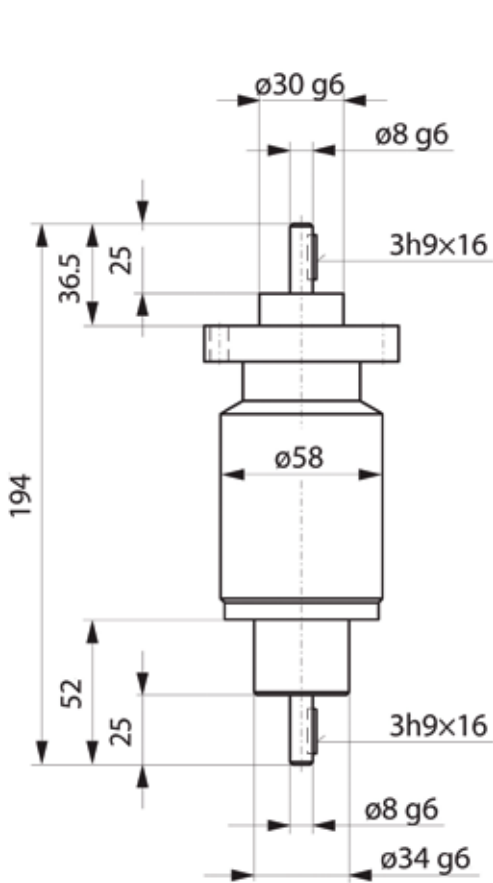
- Bellow sealed
- All-metal version



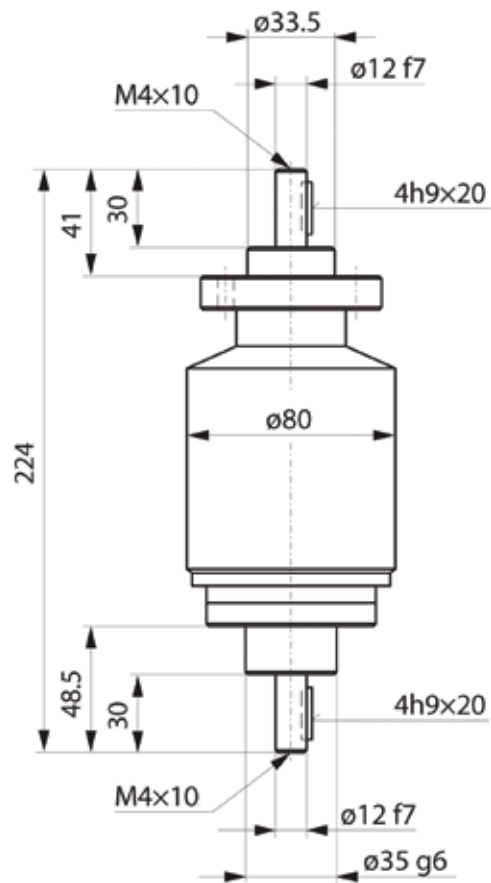
	UNIT	16 CF	40 CF	40 CF
Shaft connection	mm	4	8	12
Transferable torque: dynamic dynamic, at 300 °C static	Nm	0.4	4	10
	Nm	0.2	2	2
	Nm	0.2	3	5
Rotational speed At max. torque	rpm	200	1000	500
	rpm	-	500	300
Shaft load: radial force axial force	N	10	60	100
	N	5	20	30
Tightness	mbar.l.s ⁻¹	5.10 ⁻¹¹		
Pressure		1.10 ⁻¹⁰ mbar to 2 bar		
Operating temperature	°C	300		
Bakeout temperature	°C	300		
Materials exposed to process media	-	SS 304L SS 304		



16 CF



40 CF - 8 mm



40 CF - 12 mm

DPRS Series Differentially Pumped Rotary Seals

DPRS series differentially pumped rotary seals provide 360° of continuous rotary freedom through the wall of any vacuum system. The DPRS has two stages of differential pumping isolated by graphite-impregnated, expanded, Teflon seals on special sealing surfaces. A preloaded ball bearing set accurately controls the rotating stage position. This allows the unit to be successfully used with manipulators and other precision positioning devices.

DPRSs are available with a worm drive fine adjust option. This allows for easier and more accurate angle adjustment. DPRSs are also available with anti-backlash stepping or synchronous motor drive.



SPECIFICATIONS

- Models with clear inside diameters of 1.53" to 12" standard
- Bakeable to 150°C
- Stationary and rotation flanges, tapped
- Thickness approximately that of two CF flanges
- 2 stage differentially pumped
- Base pressures in 10^{-11} mbar range
- 0-360° scale with Vernier

READABILITY SPECIFICATIONS

- Standard scale: 1.0°
- Mechanical counter: 0.1°
- Microstepped motor drive required for maximum resolution

OPTIONS

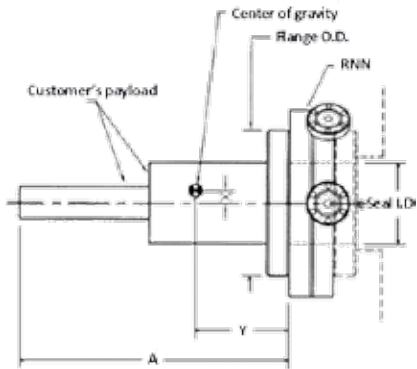
- Fine adjust worm drive
- Digital read-out on fine adjust, 0.1° read-out, mechanical, nonresetable
- Mechanical counter option available
- Anti-backlash stepping motor drive 0.018° per full step (0.0225°/full step on DPRS-150), with manual knob

PAYLOADS

The center of gravity of the payload is within "X" of the polar axis of the unit, where X is equal to 10% of the DPRS I.D. The center of gravity of the payload is within "Y" distance of the rotating flange on the horizontal mounted units, where Y is the flange I.D.

The overall maximum size "A" of the payload outside vacuum is: Vertical operation: 7 x flange O.D. Horizontal operation: 5 x flange O.D. Inverted operation: 7 x flange O.D.

MODEL	PAYLOADS (kg)			I.D. (mm)	FLANGES
	VERTICAL	HORIZONTAL	INVERTED		
DPRS-150	24.5	13.6	20.4	38.8	40 CF
DPRS-250	40.8	17.2	31.7	64.2	63 CF
DPRS-400	65.3	29.9	49.8	102.3	100 CF
DPRS-600	81.6	38.1	63.5	153.1	160 CF
DPRS-800	90.7	41.2	72.5	203.2	200 CF



Z Series Linear Translators

The Z Series Translator provides remarkably stable linear motion with a small footprint. The centerline of this compact Z stage has been designed to maintain adequate clearance radius about the traveling flange for the rotation of feedthrough hats and utilities.

FEATURES

- Position indication scale
- Bakeable to 200°C fully assembled
- Capable of mounting DPRS differentially pumped rotary seal
- Stage construction: Aluminum
- Exposure to vacuum: Stainless Steel only
- Operation: all-position
- Motorization: options available



SPECIFICATIONS

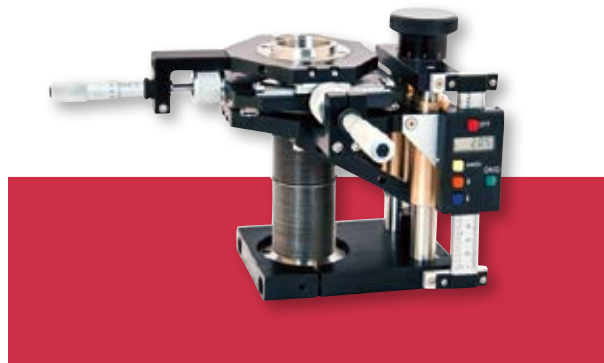
	Z-275	Z-450
Bellows I.D. (welded Stainless Steel) (mm)	38.8	47.5/63.5
Base flange	40 CF	63 CF
Traveling flange	40 CF tapped	40 CF or 63 CF tapped
Linear travel (mm)	50.8 to 304	
Actuation	Acme drive, 2.5 mm/turn, knob adjust	
Z guide rods (Stainless Steel)	Dual, 19 mm	

Manipulators

Neyco provides XYZ manipulators with high precision positioning. They feature precision preloaded crossroller stage control with preloaded micrometer-to-stage coupling. The XY guide system is made of hardened Steel.

STANDARD FEATURES

- Bakeable to 200°C fully assembled
- Hardened Steel X and Y cross-roller guides
- Dual 19 mm O.D. precision-ground Stainless Steel Z guide rods
- Travelling flange: 40 CF, tapped
- Aluminum stage construction
- Stainless Steel only material exposed to vacuum
- All position operation

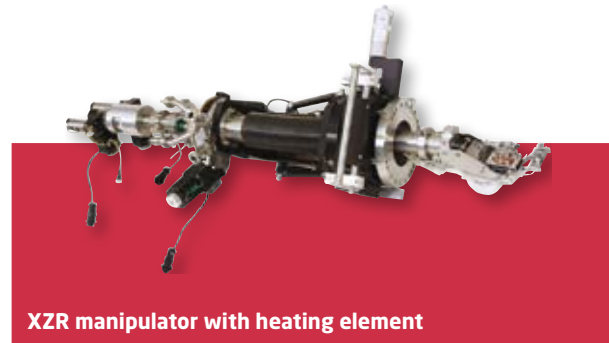


STANDARD SPECIFICATIONS

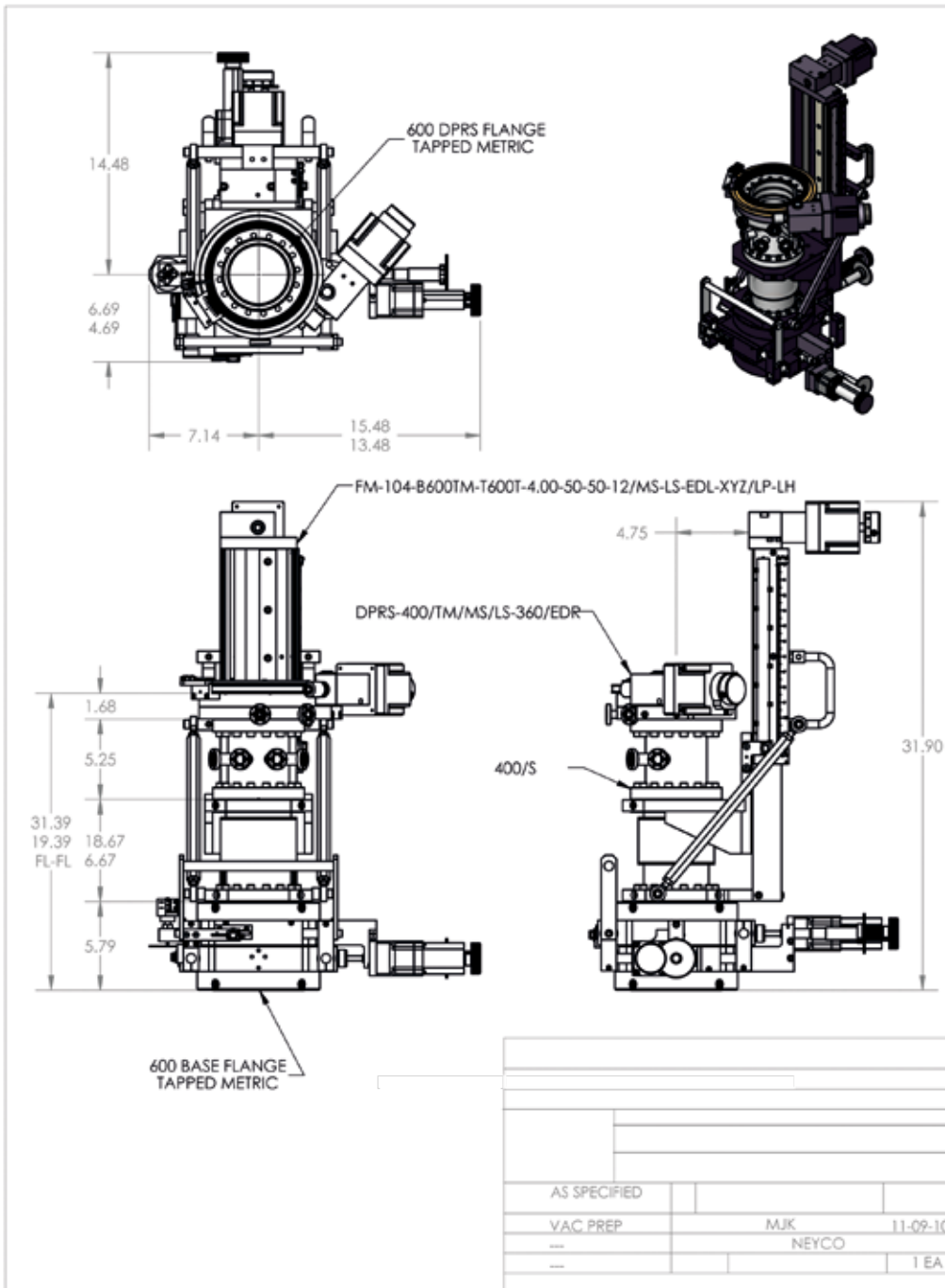
X Axis Y Axis	<p>±12.7 mm X and Y travel, circular pattern, preloaded micrometer-to-stage coupling Resolution: < 0.0025 mm readability with optional large micrometers (only) Repeatability: < 0.0038 mm Backlash: < 0.0038 mm</p>
Z Axis	<p>50 mm, 100 and 150 acme Z travel, 2.5 mm/turn knob adjust Resolution: < 0.013 mm Repeatability: < 0.013 mm Backlash: < 0.018 mm Rigidity: < 0.025 mm 2.25 kg load charge (35.3 mm I.D. bellows only)</p>
Bellows	<p>35.3 or 47.5 mm I.D.</p>

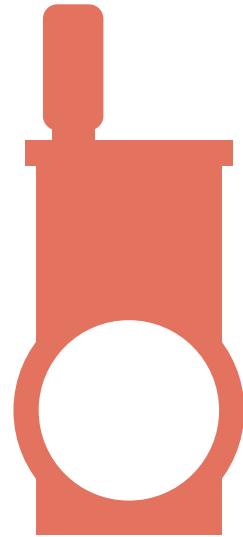
We manufacture manipulators with customer's specifications, with approval drawing.

➡ See Section F - Refractory Materials in our Materials catalogue about PBN/Heating Elements.



XZR manipulator with heating element





VACUUM VACUUM VALVES

- KF Angle & Inline Valves..... L 02
- CF Angle Valves L 05
- Dosing Valves L 07
- Gate Valves - Stainless Steel L 10
- Gate Valves - Aluminum L 13
- Other Valves L 16

KF Angle & Inline Valves

Neyco offers three KF valves series, available in angle (1/2/3) or inline versions (1/3):

1. Manually operated with bellows
2. Manually operated without bellows
3. Pneumatically operated with bellows

MAIN FEATURES

- Long life operation
- Stainless Steel welded bellows seal (if applicable)
- Bakeable to 200°C intermittently
- Compact size
- Simple and fast maintenance
- Simple control via solenoid valve with manual override

MAIN SPECIFICATIONS

Body	304 SS*
Poppet	304 SS*
Bellows	Welded AM 350
Seal	Viton O-ring
Leak rate	2.10^{-9} mbar.l.s ⁻¹
Pressure min. / max.	2.10^{-9} mbar / 1 bar
Max Δ pressure before opening	1.2 bar
Operating air pressure	4 to 6.5 kg/cm ²
Service life (full orifice open)	500.000 cycles
Bakeout temperature	150°C
Pneumatically operated	
Solenoid	Option: 24 VDC / 24 VAC / 120 VAC / 220 VAC
Position indicator	Option

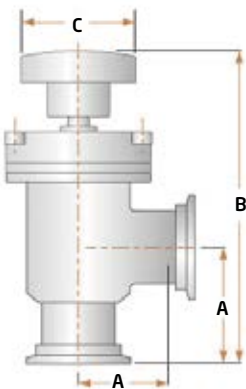
*Other materials are available upon request.

These valves are available with ISO K flanges upon request.

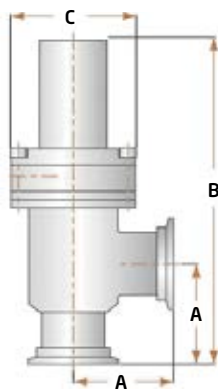
ANGLE VALVES DIMENSIONS

P/N			FLANGE	A	B			C
1-A	2-A	3-A			1-A	2-A	3-A	
NEVAS-KF16M	NEVA-KF16M	NEVAS-KF16P	16 KF	40	121.9	152.9	142	56.8
NEVAS-KF25M	NEVA-KF25M	NEVAS-KF25P	25 KF	50	128.6	159.6	149	56.8
NEVAS-KF40M	NEVA-KF40M	NEVAS-KF40P	40 KF	65	167.5	194.5	203	75.8
NEVAS-KF50M	NEVA-KF50M	NEVAS-KF50P	50 KF	70	190.5	232.7	246	88.4

All dimensions are in mm. Dimensions subject to change.



Manually operated



Pneumatically operated



Manual angle valves

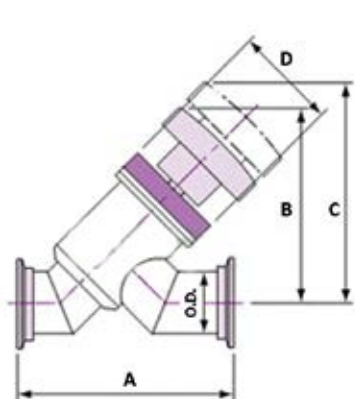


Pneumatic angle valve

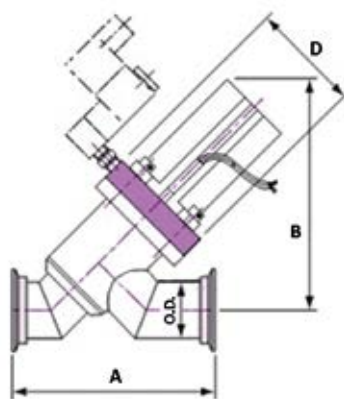
INLINE VALVES DIMENSIONS

P/N		FLANGE	A	B		C	D	O.D.
1-Y	3-Y			1-Y	3-Y			
NEVYS-KF16M	NEVYS-KF16P	16 KF	101.6	98.8	120.4	112.5	56.9	19
NEVYS-KF25M	NEVYS-KF25P	25 KF	106.7	98.8	120.4	112.5	56.9	25.4
NEVYS-KF40M	NEVYS-KF40P	40 KF	130	124.2	156.7	147.3	75.7	38.1
NEVYS-KF50M	NEVYS-KF50P	50 KF	177.8	142	188.7	173.5	88.4	50.8

All dimensions are in mm. Dimensions subject to change.



Manually operated



Pneumatically operated

CF Angle Valves

Neyco offers manually actuated angle valves with rotatable CF flanges, from DN 16 to 63.

Standard Series

- For UHV and HV applications
- Bakeable up to 180°C in open and closed position
- Viton sealed
- Maintenance-free

All-metal Series

- For UHV applications
- Bakeable up to 300°C in open and closed position
- Copper sealed
- Maintenance-free

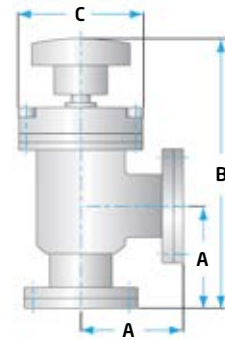
SPECIFICATIONS

	Standard	All-Metal
Available flanges	16 CF-R/40 CF-R/63 CF-R	
Body	SS 304	
Bellows	SS 321	
Valve plate, seal	Viton O-ring	Copper
Valve plate	SS 304	
Leak rate internal external	1.10 ⁻⁹ mbar.l.s ⁻¹ 5.10 ⁻¹¹ mbar.l.s ⁻¹	5.10 ⁻¹¹ mbar.l.s ⁻¹ 5.10 ⁻¹¹ mbar.l.s ⁻¹
Tightening torque 16/40/63 CF-R	≤ 1 / ≤ 1.8 / ≤ 2.5 Nm	8-10 / 20-40 / 30-60 Nm
Conductance 16/40/63 CF-R	3/38/100 l/s	
Pressure min./max.	1.10 ⁻⁹ mbar / 4 bar	1.10 ⁻¹⁰ mbar / 4 bar
Service life	50.000 cycles	1.000 cycles
Bakeout temperature (w/o hand wheel)	180°C	300°C

DIMENSIONS

STANDARD P/N	ALL-METAL P/N	FLANGE	A	B	C
NEVASS-CF16M	NEVASAM-CF16M	16 CF-R	38	119.4	62
NEVASS-CF40M	NEVASAM-CF40M	40 CF-R	63	177.5	62
NEVASS-CF63M	NEVASAM-CF63M	63 CF-R	105	267.6	74

All dimensions are in mm. Dimensions subject to change.



16 CF-R



40 CF-R



63 CF-R

Dosing Valves

MANUALLY ACTUATED COARSE GAS DOSING VALVE

This vacuum valve is specially suitable for admitting a reproducible flow of gas into a vacuum chamber.

SPECIFICATIONS

Connection flange	10 KF
Body	Aluminum
Seals	Viton
Helium leak rate	$1 \cdot 10^{-8}$ mbar.l.s ⁻¹
Pressure min. / max.	$1 \cdot 10^{-7}$ / 4 mbar
Gas flow, controllable min. / max.	40 / 1700 mbar.l ⁻¹ .s ⁻¹
Bakeout temperature	100°C



MANUALLY ACTUATED DOSING AND SHUT-OFF VALVE

MAIN FEATURES

- Very wide control range
- Optimal control characteristics
- Digital display
- Excellent reproducibility
- Integrated shut-off valve
- Closing without change of flow sett

SPECIFICATIONS

Connection flange	16 KF
Housing, needle, filter	Stainless Steel
Dosing sleeve, seal	Viton
Helium leak rate	1.10^{-9} mbar.l.s ⁻¹
Differential pressure	2.5 bar
Dead volume	0.032 cm ³
Gas flow, controllable min./max.	5.10^{-6} /1000 mbar.l ¹ .s ⁻¹
Operating temperature	80°C
Bakeout temperature	150°C



ALL-METAL DOSING VALVE

Our all-metal dosing valve includes a movable piston with an optically flat sapphire that meets a captured metal gasket. This forms a seal completely free from friction, seizing, and shear. The sapphire's movement is controlled through a threaded shaft-and-lever mechanism.

MAIN FEATURES

- Minimal dead volume
- Controlled routing of the gas flow using capillaries
- Operating temperature 200°C
- Control of total pressure or gas flow
- Actuator: manual
- Option: automatic control in conjunction with VCE500

SPECIFICATIONS

Connection flanges Input Output	16 CF-R 40 CF-R
Body	Stainless Steel
Valve plate	Sapphire
Valve seat	Copper
Helium leak rate	1.10^{-11} mbar.l.s ⁻¹
Pressure min./max.	1.10^{-11} /30 mbar *
Conductance for molecular flow	0.7 l/s
Gas flow, controllable min./max.	1.10^{-10} /600 mbar.l ¹ .s ⁻¹ **
Operating temperature	200°C
Bakeout temperature	350°C



All-metal dosing valve

* 1.10^{-10} /30 mbar in conjunction with VCE500

** 1.10^{-10} /100 mbar.l¹.s⁻¹ in conjunction with VCE500



Controller VCE500


ACCESSORIES

- Capillary complete, vacuum side, 1 m
- Heater, 200°C
- Adaptor 40/16 CF
- Controller VCE500
- Cable, 80°C: 3 m/12 m
- Cable extension, 200°C: 2 m

	Controller VCE 500
Power supply	115 / 230 V
Frequency	50 to 60 Hz
Power consumption	20 VA
Regulating characteristic	Proportional-integral (PI)
Reset time	2 to 30 s
Proportional gain	2 to 1000

SPARE PARTS

- Valve plate, sapphire
- Valve seat, standard
- Valve seat, Gold plated

 See Section B - Vacuum Control in this catalogue about Gas Dosing Systems.

Gate Valves - Stainless Steel

Neyco offers gate valves designed for high vacuum applications. These valves provide valving for cryopumps, turbo pumps, ion pumps and other applications requiring clean, low outgassing valves. Metal-sealed CF flanges provide compatibility with UHV systems when pressure ranges approximate 10^{-10} mbar and higher bakeout temperatures of 200°C are needed. These valves can also be configured for higher temperatures by using hi-temp elastomer O-rings, grease and parts.

These gate valves are available in 4 types:

- Manual with Viton bonnet (HV series)
- Manual with Copper bonnet (UHV series)
- Pneumatic with Viton bonnet (HV series)
- Pneumatic with Copper bonnet (UHV series)

SPECIFICATIONS

Valve body and gate	SS 304
Welded bellows shaft seal	AM 350
Bonnet / gate seals	Viton / Viton (HV) Copper / Viton (UHV)
Helium leak rate	$< 2 \cdot 10^{-9}$ mbar.l.s ⁻¹
Pressure range	1.10 ⁻⁹ mbar (HV) 1.10 ⁻¹⁰ mbar (UHV)
Differential pressure closed	1 bar in either direction
Max Δ pressure before opening	≤ 30 mbar
Service life (full orifice open)	500.000 cycles
Bakeout temperature	150°C (HV) 200°C (UHV), valve open 150°C (UHV), valve closed
Mounting position	Any
Cycles until service	100.000 cycles (dependent on process)

Mechanism	
Pneumatic air service	80 psig
Voltages solenoid	24 / 120 / 200 / 240 V AC, 50/60 Hz 12 / 24 V DC
Position Indicator, max	115 V AC 28 V DC

OPTIONS

- Kalrez seals for both bonnet and gate seals
- Microswitches for position indicators
- Motor operators
- Spring loaded: Air-to-open, Spring-to-close on sizes up to DN 80
- High temperature components including O-rings, microswitches and actuators

AVAILABLE FLANGES

	KF / ISO K	ISO F	CF-F
Manual HV series	DN 16 to DN 200	DN 63 to DN 320	DN 16 to DN 300
Manual UHV series	-	-	DN 16 to DN 300
Pneumatic HV series	DN 16 to DN 200	DN 63 to DN 500	DN 16 to DN 300
Pneumatic UHV series	-	-	DN 16 to DN 300



Manual CF gate valve



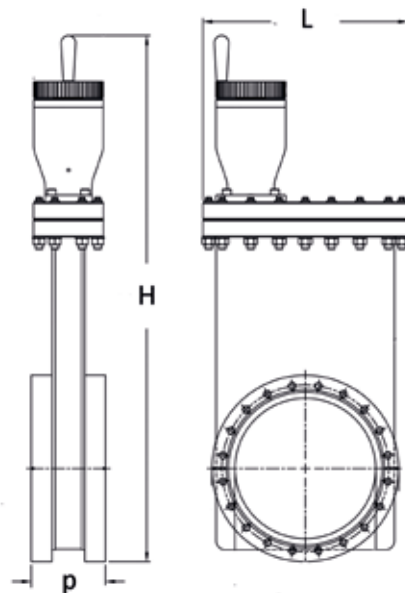
Pneumatic CF gate valve

MAXIMAL DIMENSIONS

DN	KF/ISO K - HV & UHV SERIES				ISO F - MANUAL			ISO F - PNEUMATIC		
	L	P	H - MANUAL	H - PNEUMATIC	L	P	H	L	P	H
16	47.6	75.2	108.4	126.0	-	-	-	-	-	-
40	84.1	50.7	211.6	254.2	-	-	-	-	-	-
50	96.8	50.7	234.3	277.2	-	-	-	-	-	-
63	130.0	87.8	278.7	321.4	130.0	51.4	278.7	130.0	51.4	321.4
80	139.3	97.4	307.6	350.5	145.0	50.0	310.6	145.0	50.0	353.4
100	171.5	107.8	492.3	469.0	177.8	61.1	489.1	177.8	61.1	465.8
160	228.6	107.8	584.5	561.2	225.0	59.8	582.7	225.0	59.8	559.4
200	279.4	107.8	693.4	670.1	285.8	67.4	696.6	285.8	67.4	673.2
250	-	-	-	-	335.0	80.1	936.4	341.4	80.1	873.0
320	-	-	-	-	424.9	80.1	1076.2	425.0	80.1	1012.8
400	-	-	-	-	-	-	-	527.1	97.8	1253.8
500	-	-	-	-	-	-	-	644.5	121.2	1577.8

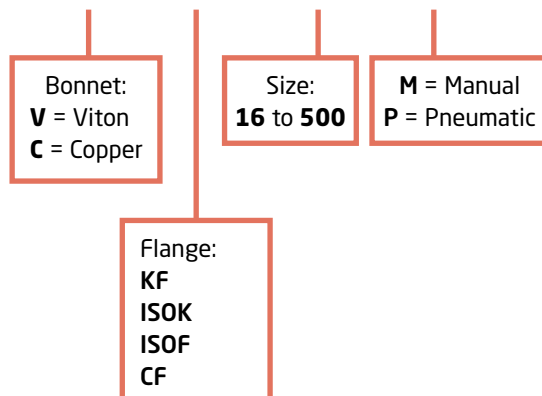
DN	CF - HV & UHV SERIES			
	L	P	H - MANUAL	H - PNEUMATIC
16	47.6	39.6	108.6	126.1
40	84.1	51.5	212.7	255.3
50	96.8	57.9	239.5	281.9
63	113.5	61.2	270.5	313.1
80	133	64.2	296.9	339.7
100	177.8	75.3	482.3	459.1
160	222.3	80.4	571.3	548.1
200	285.8	85	686.5	663.3
250	330.2	92.8	934.0	867.4
300	381	99.0	1054.1	987.5

All dimensions are in mm. Dimensions subject to change.



ORDERING P/N GUIDE

NEGVSS - V - KF - DN - M



Gate Valves - Aluminum

Neyco offers Aluminum gate valves designed for high vacuum applications specifically when pressure ranges approximate 1.10^{-7} mbar and bakeout temperatures do not exceed 150°C. They feature precision machined high strength aluminum bodies from solid 6061-T6 billet, dual quad ring long life shaft seals and high performance PEEK components.

These gate valves are available in 2 types:

- Pneumatic with Viton bonnet and gate O-rings (includes reed switch position indicators)
- Manual with Viton bonnet and gate O-rings (no position indicators)

SPECIFICATIONS

Valve body and gate	Aluminum 6061-T6
Shaft	Al (DN 40 to DN 80) 304 SS (DN 100 to DN 500)
Carriage	Aluminum 6061-T6/PEEK
Bonnet / gate / shaft seals	Viton/Viton/Viton
Helium leak rate	$< 2.10^{-9}$ mbar.l.s ⁻¹
Pressure range	1.10^{-7} mbar
Differential pressure closed	≤ 1.6 bar in either direction
Max Δ pressure before opening	≤ 30 mbar
Service life (full orifice open)	500.000 cycles
Bakeout temperature valve body and gate actuator	120°C 80°C
Mounting position	Any
Cycles until service	400.000 cycles (DN 40 to 160) 250.000 (DN 200 to 320)

Mechanism	
Pneumatic air service	80 psig
Voltages solenoid	24/120/200/240 V AC, 50/60 Hz 12/24 V DC
Position Indicator, max	115 V AC/20 mA 28 V DC/20 mA

OPTIONS

- Kalrez seals for both bonnet and gate seals
- Microswitches for position indicators
- Motor operators
- Spring loaded: Air-to-open, Spring-to-close on sizes up to DN 80
- High temperature components including O-rings, microswitches and actuators



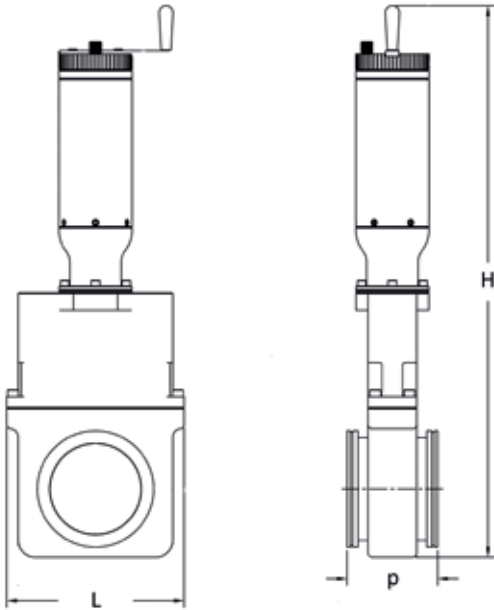
AVAILABLE FLANGES

	KF/ISO K	ISO F
Manual HV series	DN 16 to DN 200	DN 63 to DN 320
Pneumatic HV series	DN 16 to DN 200	DN 63 to DN 500

MAXIMAL DIMENSIONS

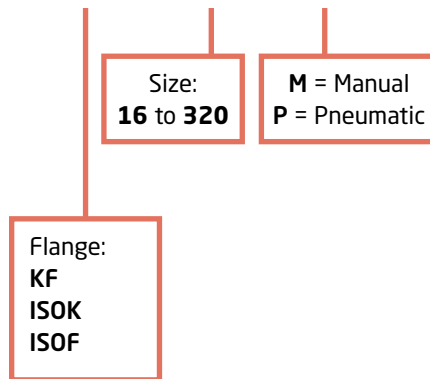
DN	KF/ISO K				ISO F			
	L	P	H - MANUAL	H - PNEUMATIC	L	P	H - MANUAL	H - PNEUMATIC
40	100.1	50.7	353.1	302.9	-	-	-	-
50	112.7	50.7	391.2	341.0	-	-	-	-
63	125.4	86.0	435.4	385.2	130.0	60.0	449.6	399.4
80	138.1	86.0	471.0	420.8	145.0	60.0	483.2	433.0
100	198.1	101.0	616.5	566.0	198.1	75.0	622.8	552.2
160	254.0	101.0	806.1	755.0	254.0	85.0	806.1	752.2
200	-	-	-	-	292.1	100.0	994.0	937.1
250	-	-	-	-	355.6	100.0	1144.0	1089.5
320	-	-	-	-	424.9	110.0	1314.0	1257.6

All dimensions are in mm. Dimensions subject to change.



ORDERING P/N GUIDE

NEGVA - V - KF - DN - M



Other Valves

MANUALLY ACTUATED VENTING VALVE

This valve offers the advantage of simple opening and closing by loosening or tightening the screw cap.

SPECIFICATIONS

	Aluminum	Stainless Steel
Connection flange	10 KF	10 KF
Housing	Aluminum	SS 303
Valve plate	Aluminum	SS 304
Screw cap	Brass Nickel plated	Brass Nickel plated
Seal	Viton	Viton
Leak rate	1.10^{-9} mbar.l.s ⁻¹	1.10^{-9} mbar.l.s ⁻¹
Pressure min./max.	1.10^{-8} mbar / 5 bar	1.10^{-8} mbar / 5 bar



VACUUM SAFETY VALVES

ADVANTAGES

- Fast-closing high vacuum isolation valve for separating the vacuum chamber from the backing pump
- Venting valve for roughing pumps
- Immediate closing action upon power failure
- Opening action only after the intake line has been evacuated

SPECIFICATIONS

Available flanges	16 KF / 25 KF / 40 KF
Solenoid voltage	24 V DC / 110 V AC / 220 V AC
Housing, flange	Aluminum
Seals	Viton
Leak rate body valve plate	< 1.10 ⁻⁹ mbar.l.s ⁻¹ < 1.10 ⁻⁵ mbar.l.s ⁻¹
Pressure min. / max.	1.10 ⁻⁸ mbar / 1 bar
Conductance	3.8 / 11 / 30.5 l/s
Operating temperature	5°C to 50°C
Bakeout temperature	< 60°C (housing) < 50°C (actuator)
Required pressure difference up for the safety valves to function properly	> 150 mbar in closing direction < 150 mbar in opening direction



PRESSURE RELIEF VALVE

ADVANTAGES

- Protects vacuum systems from pressure > 1.5 bar
- Relief trigger point 1.2 to 1.5 bar absolute

SPECIFICATIONS

Connection flange	16 KF
Housing	Stainless Steel
Seal	Viton
Leak rate	1.10 ⁻⁹ mbar.l.s ⁻¹
Pressure min. / max.	1.10 ⁻⁸ mbar / 1.2 bar
Gas flow	0 to 6 l.min ⁻¹
Operating temperature	0°C to 50°C
Bakeout temperature	150°C



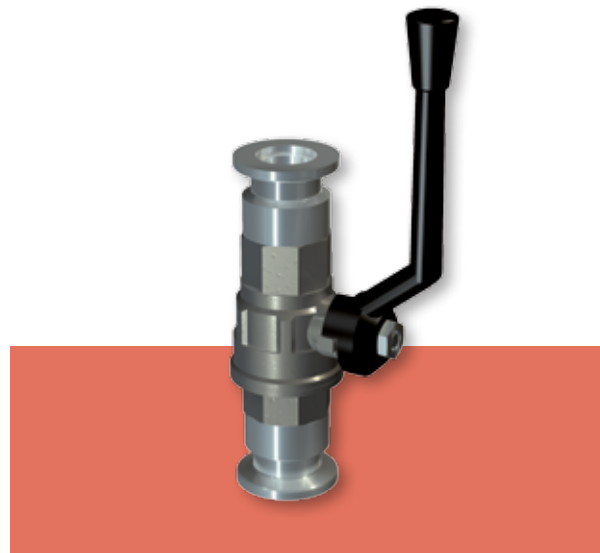
BALL VALVES

ADVANTAGES

- Rugged and cost effective
- Simple opening and closing by lever
- Unobstructed passage

SPECIFICATIONS

Available flanges	10KF / 16 KF / 25 KF / 40 KF
Housing	Brass Nickel plated
Seal	PTFE
Leak rate	1.10^{-5} mbar.l.s ⁻¹
Pressure min. / max.	1.10^{-5} mbar / 5 bar
Conductance	1.5 / 3 / 9 / 30 l.s ⁻¹
Bakeout temperature	80°C



DIAPHRAGM VALVES MANUALLY ACTUATED

The KF diaphragm valve line performs as a gauge isolation, roughing or venting valve. The manual spindle drive allows easy gas dosing. The robust and rugged industrial design is well suited for gases and liquids and is resistant against dirty environment.

ADVANTAGES

- Spindle drive for controlled venting and easy dosing
- Low operating force required
- Visual position indicator
- Viton diaphragm sealing; other sealing materials on request
- Aluminum inline housing
- Easy maintenance, fast diaphragm seal replacement
- Small footprint and easy system integration

SPECIFICATIONS

Available flanges	16 KF / 25 KF / 40 KF
Housing	Aluminum EN AW-6082
Diaphragm	Viton
Leak rate	1.10^{-9} mbar.l.s ⁻¹
Operating pressure min. / max.	1.10^{-7} mbar / 5 bar
Pressure max.	5 bar
Conductance	2 / 5 / 17 l.s ⁻¹
Service temperature	0°C to 50°C
Cycle life	> 10.000 cycles





VACUUM PUMPING & MAINTENANCE

- Dry Pumps M 02
- Scroll Pumps M 04
- Rotary Vane Pumps M 07
- Roots Pumps M 16
- Rotary Piston Pumps M 19
- Turbo Pumps M 31
- Turbo Pumping Stations M 39
- Diffusion Pumps M 42
- Helium Leak Detectors M 46

Dry Pumps

ACP SERIES: DRY COMPACT MULTI-STAGE ROOTS PUMPS

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

The frictionless pumping module is optimized to operate without internal lubricant and provides outstanding oil-free vacuum with no hydrocarbon vapor backstreaming. Without any seals between rotor and stator no particles are generated.

The absence of wearing parts inside the pumping module allows for unsurpassed long-term stability and high reliability in even the most demanding applications.

The frequency converter driven motor provides constant rotational speed, thus stable pumping speed and consistent ultimate pressure are achieved all over the world.

ACP pumps require overhaul only every 22.000 hours of operation for the ACP 28/40 and 20.000 hours of operation for the ACP 15 resulting in low cost of ownership.

High flow gas ballast ports and drainable silencers allow the ACP to pump high amounts of condensable vapors (up to 1.000 g/h of pure water vapor).

Standard version: for applications that require pumping of clean (dust-free) and non-corrosive gases. Standard pumps are equipped with a gas ballast device to improve pumping of light gases and avoid vapor condensation inside the pump.

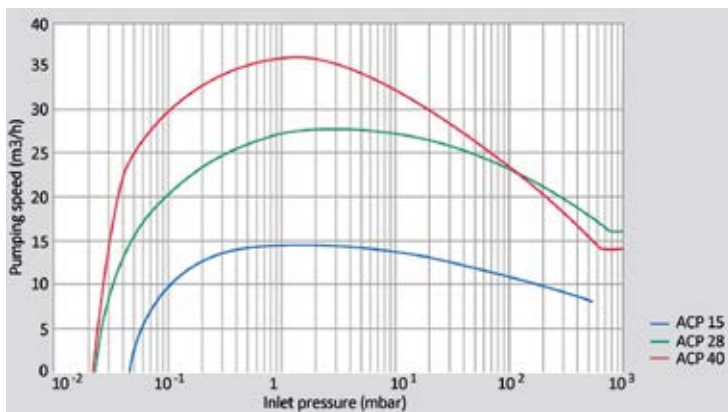
G version: the G version pump is compatible with traces of corrosive gases. Three purge gas jets protect low and high pressure bearings and dilute trace amounts of corrosive gases.

CV version: the CV version is specially designed to avoid vapor condensation inside the pumping module.

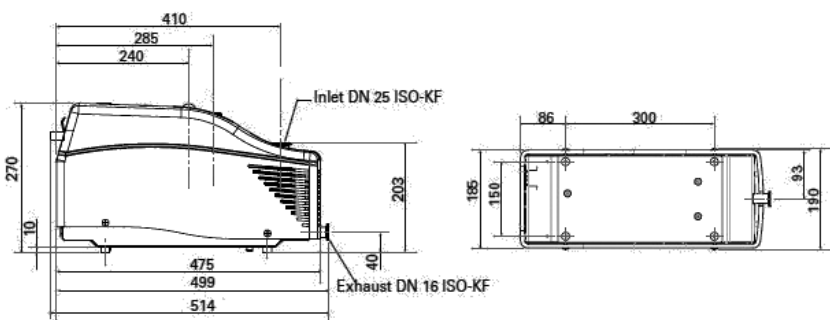
TECHNICAL DATA

	UNIT	ACP15	ACP28	ACP40
Pumping speed max.	m ³ /h	14	27	37
Ultimate vacuum without purge gas	mbar	3.10 ⁻²	3.10 ⁻²	3.10 ⁻²
Power supply 1-Phase 3-Phase		100-230 V +/-10%, 50/60Hz 200-440 V +/-10%, 50/60Hz		
Power consumption	At ultimate pressure	W	450	700
	At atmosphere		550	1050
Flange In	DN	25 KF	25 KF	40 KF
Flange Out	DN	16 KF	25 KF	25 KF
Weight	kg	23	30	32

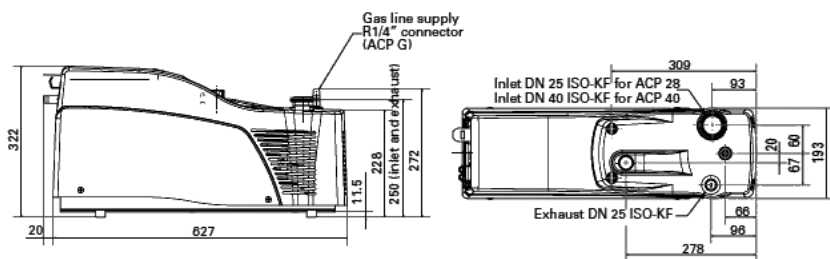
PERFORMANCE CURVES



DIMENSIONS (mm)



ACP 15



ACP 28 / 40

Scroll Pumps

nXDS SERIES

The nXDS Series from Edwards is the next generation in completely oil free, dry scroll pumps and can be used to replace similar sized dry pumps and medium sized oil sealed pumps in a variety of applications. nXDS improves on legacy XDS pumps by offering increased pumping speeds, combined with lower ultimate pressures, lower power consumption and lower noise. Gas ballast allows for pumping of condensable vapours including, water, solvents, dilute acids and bases. nXDS pumps also feature the latest in tip seal technology giving significantly longer life between tip seal changes. Integrated inverter drive with auto sensing voltage input delivers optimized pumping performance globally. nXDS pumps are designed to be completely field serviceable.



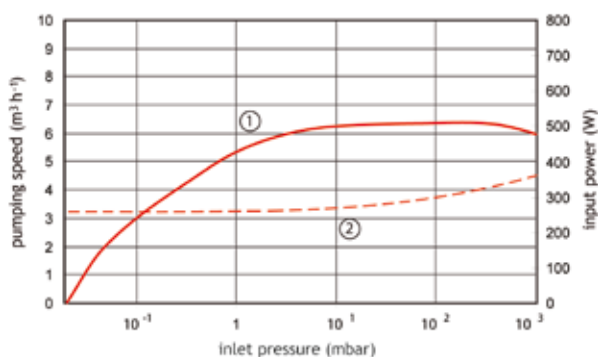
APPLICATIONS

- General clean pumping applications
- Scanning Electron Microscopes (SEM)
- Beam lines and high energy physics
- Backing turbo pumps
- Centrifuges, ultra-high speed
- Coating
- Cryogenics
- Degassing/curing - oil, epoxy resin
- Distillation/extraction/filtration
- Freeze drying
- Furnaces
- Gel drying
- Lasers, gas recovery and recirculation
- Leak detectors, Helium
- Load locks and transfer chambers
- Rotary, centrifugale vaporators
- SEM/FIB (ion beam repair)
- Solvent recovery

TECHNICAL DATA

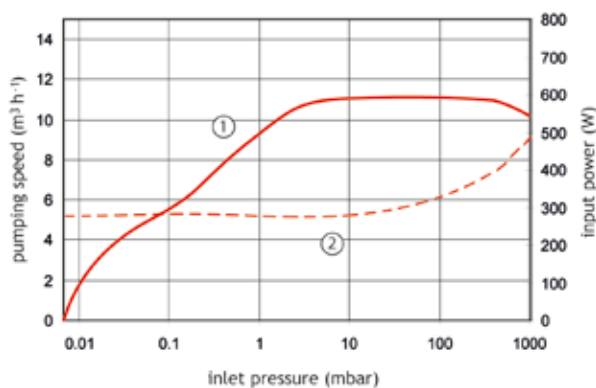
	UNIT	nXDS6i	nXDS10i	nXDS15i	nXDS20i
Pumping speed max.	m ³ /h	6.8	12.7	17.1	28.0
Ultimate vacuum	mbar	2.10 ⁻²	7.10 ⁻³	7.10 ⁻³	3.10 ⁻²
Rated power	W	260	280	300	260
Noise level	dB(A)	52	52	52	52
Flange IN	DN	25 KF	25 KF	25 KF	25 KF
Flange OUT	DN	25 KF	25 KF	25 KF	25 KF
Weight	kg	26.2	25.8	25.2	25.6

PERFORMANCE CURVES



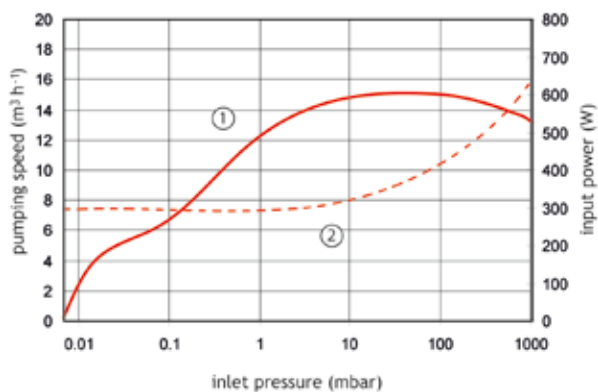
① Pumping speed ② Input power

nXDS6i



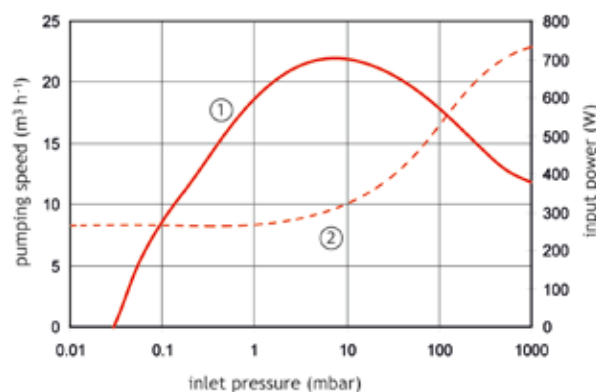
① Pumping speed ② Input power

nXDS10i



① Pumping speed ② Input power

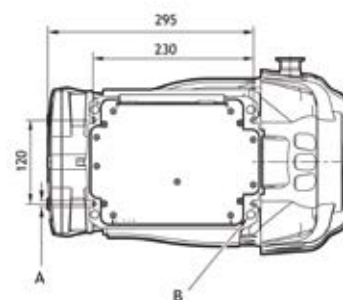
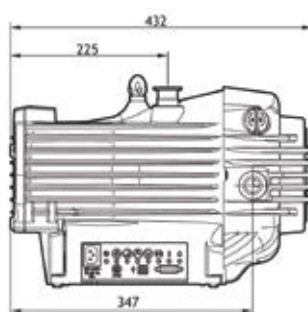
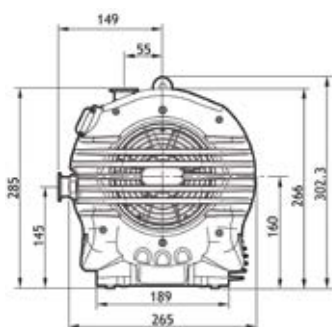
nXDS15i



① Pumping speed ② Input power

nXDS20i

DIMENSIONS (mm)



A Wide slots (x4)
B Rubber feet (x4)

XDS SERIES

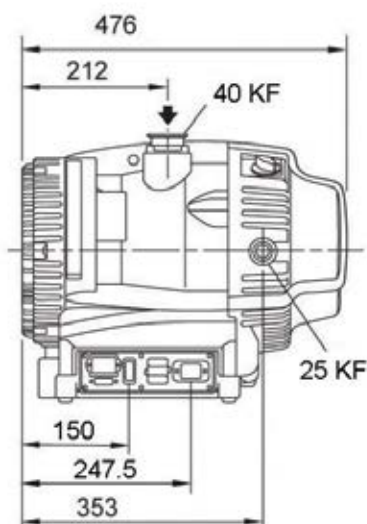
The XDS35i pump has an innovative bearing shield design that isolates the vacuum environment from all forms of lubricant, not only making it totally dry but hermetically sealed. The shield also protects the bearing from any process vapours. Gas ballast allows vapour to be handled and opens up the range of applications to many that were previously unsuited to scroll pumps. The inverter drive controls the motor characteristics and ensures the pump always runs at optimum speed.



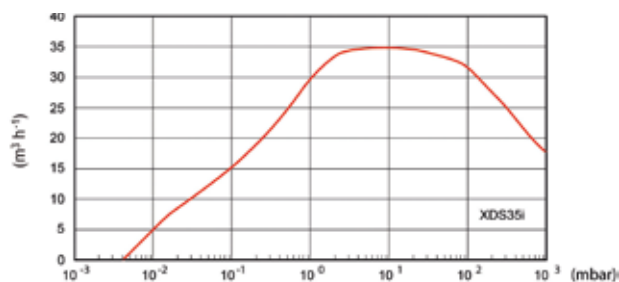
TECHNICAL DATA

	UNIT	XDS35I
Pumping speed max.	m ³ /h	43
Ultimate vacuum	mbar	1.10 ⁻²
Rated power	W	520
Noise level	dB(A)	57
Flange IN	DN	40 KF
Flange OUT	DN	25 KF
Weight	kg	48

DIMENSIONS (mm)



PERFORMANCE CURVE



Rotary Vane Pumps

PASCAL SERIES TWO-STAGE

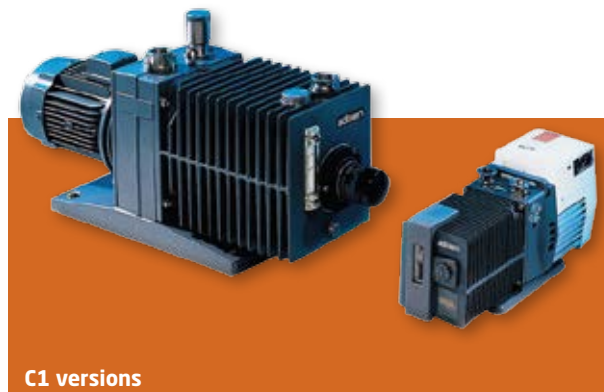
The pumps from the Pascal Series from Pfeiffer Vacuum with their high performance are used in the most demanding applications in Industry, Analytics and Research & Development, for backing vacuum and medium vacuum.

The oil emission on the outlet is minimized through the optimal lubrication design. The integrated non-return system guarantees optimal leak-tight properties by design. The assignment of all operating elements and service accesses on the front side of the vane pumps guarantees a simple integration in systems. The compact models with a pumping speed between 5 and 21 m³/h are equipped with universal motors, which allow for worldwide usage. The configuration of the single stage motors occurs through a simple plug-in position. Three-phase motors of high capacity pumps guarantee compliance with international requirements for operating voltages, frequencies and standards.

The Pascal Series is designed for maximum reliability and minimal maintenance. The external shaft seals can be easily exchanged without disassembling the pump. Thus, all pumps can be simply maintained in the field with the fitting original maintenance sets.

Neyco provides two versions of the lubricated two-stage Pascal pumps:

- SD versions available for all vacuum applications with non-corrosive gases (R&D, Lamps manufacturing, Metallurgy, Centrifuges...)
- C1 version specially designed for pumping corrosive or aggressive gases in the chemical industry and R&D (Corrosion resistant materials)



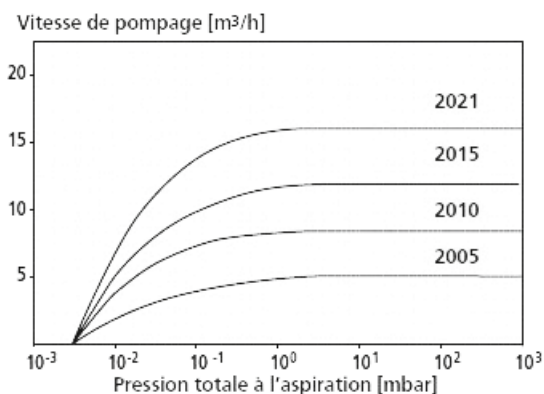
TECHNICAL DATA

Motors and Voltage ranges: single phase (from 5 to 21 m³/h) or three-phase (from 5 to 63 m³/h), low voltage or high voltage.

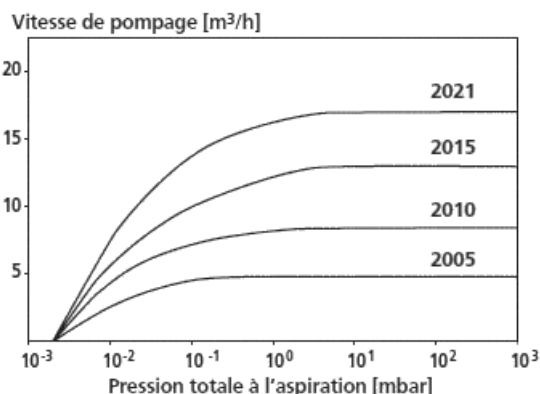
	UNIT	2005SD	2010SD	2015SD	2021SD	2033SD	2063SD
Pumping speed max. 50 Hz/60 Hz	m ³ /h	5.4/6.5	9.7/11.6	15/18	20.7/24.8	30/39.6	60/72
Ultimate vacuum	mbar	2.10 ⁻³	2.10 ⁻³	2.10 ⁻³	2.10 ⁻³	3.10 ⁻³	3.10 ⁻³
Ultimate vacuum with gas ballast	mbar	10 ⁻²	10 ⁻²	10 ⁻²	10 ⁻²	2.10 ⁻²	2.10 ⁻²
Rated power 50 Hz/60 Hz	kW	0.45/0.55	0.45/0.55	0.45/0.55	0.45/0.55	1.1/1.3	2.2/2.6
Oil capacity	L	0.83	0.95	0.95	0.98	3.6	7
Flange IN	DN	25 KF	25 KF	25 KF	25 KF	40 KF	40 KF
Flange OUT	DN	25 KF	25 KF	25 KF	25 KF	40 KF	40 KF
Weight SD/C1	kg	25	26	27	28	61/74	93/98

Single-stage pumps are available on request.

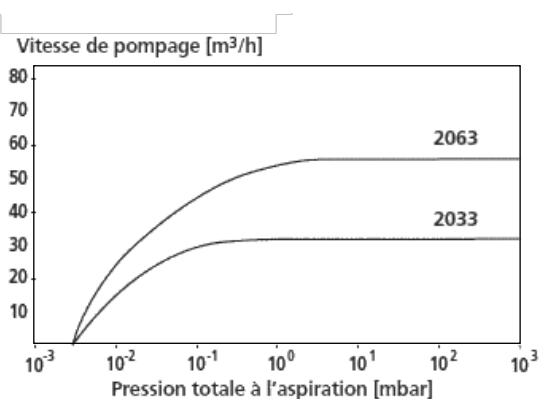
PERFORMANCE CURVES



SD versions

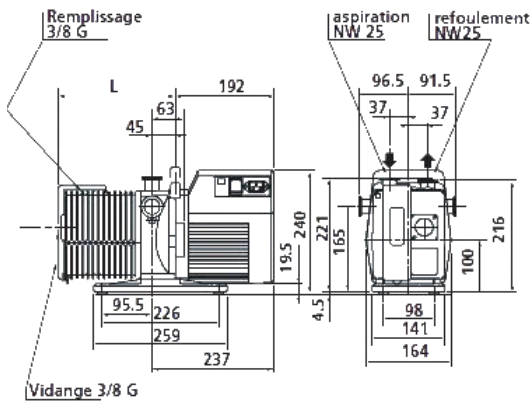


C1 versions

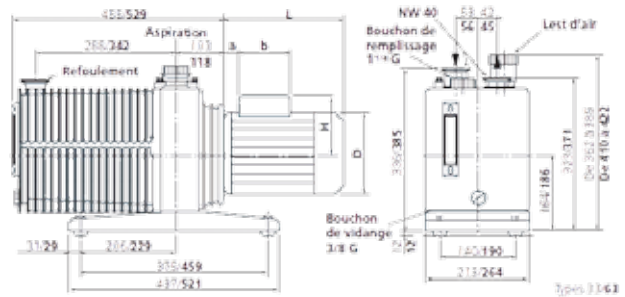


SD and C1 versions

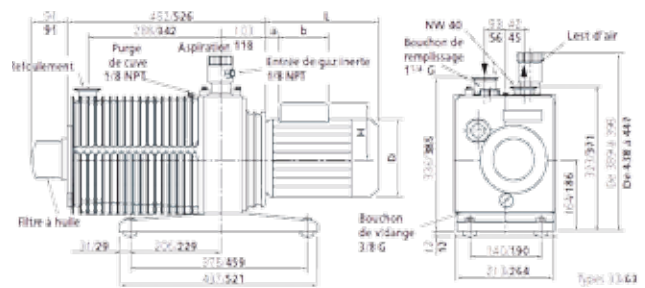
DIMENSIONS (mm)



SD and C1 versions, 2005/2010/2015/2021



SD versions, 2033/2063



C1 versions, 2033/2063

ACCESSORIES

Flange: DN-25 KF or 40 KF

TYPE	MODEL	FEATURES
Oil mist eliminator OME	25S/40S	Oil mist eliminators retain oil mist contained in the exhaust
	25HP	Specially designed for applications involving frequent cycling or high pressure operation
	25HP+/40HP+	With more efficient cartridge designed for applications involving frequent cycling or high pressure operation
	25 C/H	For applications involving corrosive gases or high level of tightness
	40C1	For applications involving corrosive gases, except fluorinated gases
Sorption trap ST	40C2	For applications involving corrosive gases, including fluorinated gases
	ST 25S	Prevents operating fluid backflow on the intake side With zeolite or alumina
Inlet dust filter DFT	ST25C/ST40	With electrical heating element (110V or 220V)
	DFT 25	With spare cartridge, for dust > 6µm
Liquid nitrogen trap LNT	LNT 25S	To trap gases. Aluminum + Stainless Steel
	LNT 25C	Stainless Steel
	LNT 25P	Glass + Aluminum
Condensate trap CT	CT 25	To trap liquid or solid materials



OME 25S



OME 25HP



ST 25S



DFT 25



LNT 25C



LNT 25P



CT 25

SSI SERIES SINGLE-STAGE

SSI series lubricated rotary vane, single-stage pumps from Neyco are specially developed for Industries.

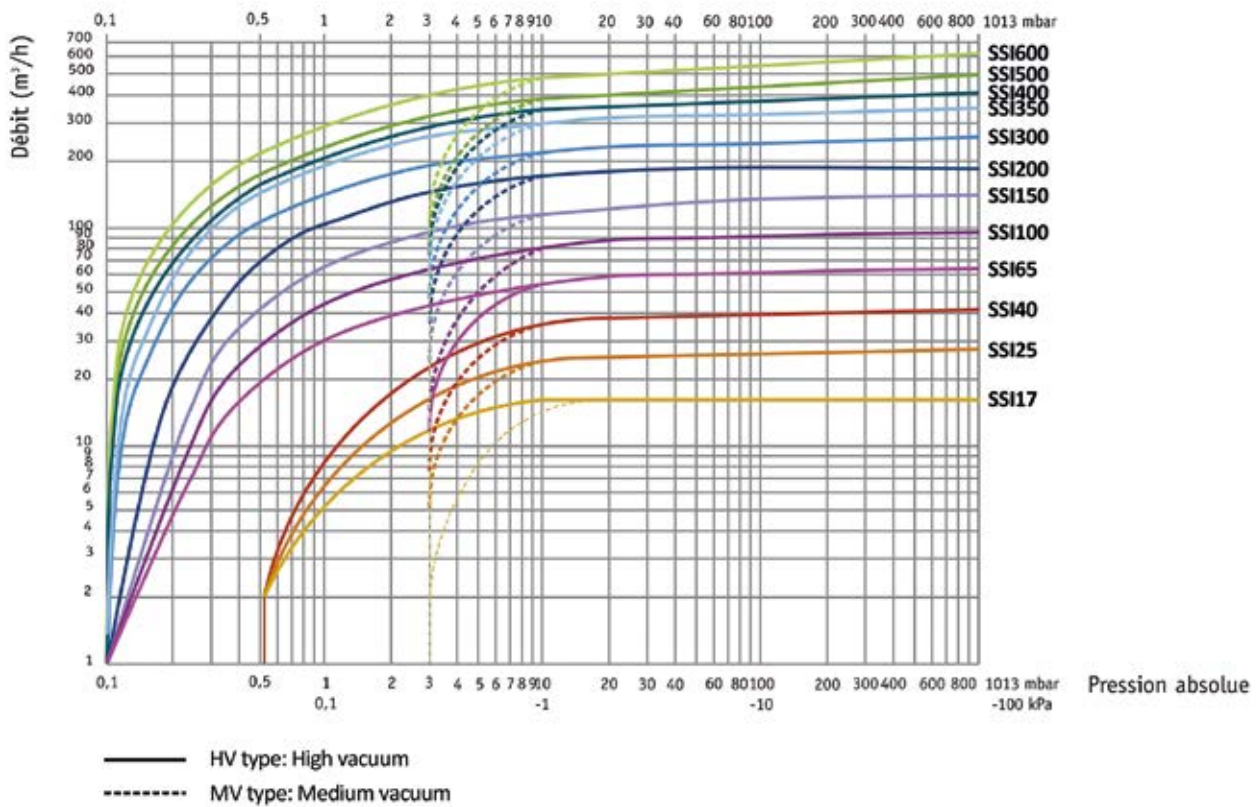
They are reliable and robust, designed for low (HV type) and medium (MV type) vacuum.

- Built for heavy duty applications
- Suitable for high water vapor tolerance
- Continuous running from atmospheric pressure to end vacuum
- Air cooling (different levels further to application)
- Standard motor coupling (1-ph or 3-ph)
- PF55 motor - F class
- Available in oxygen special version with specific oil
- Pumping on aggressive products: contact us

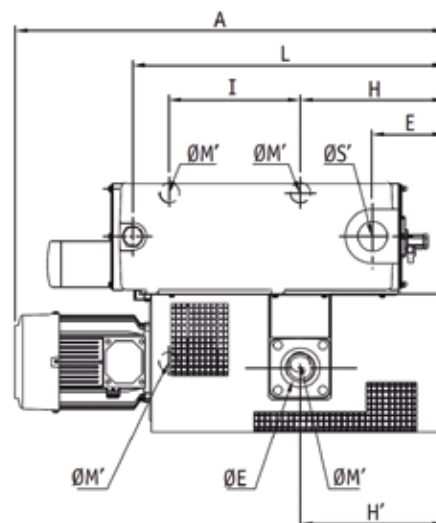
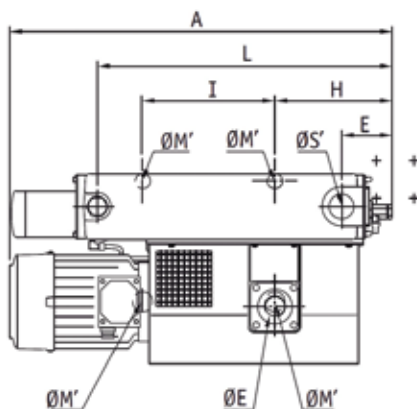
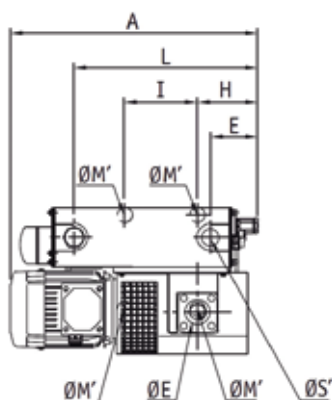
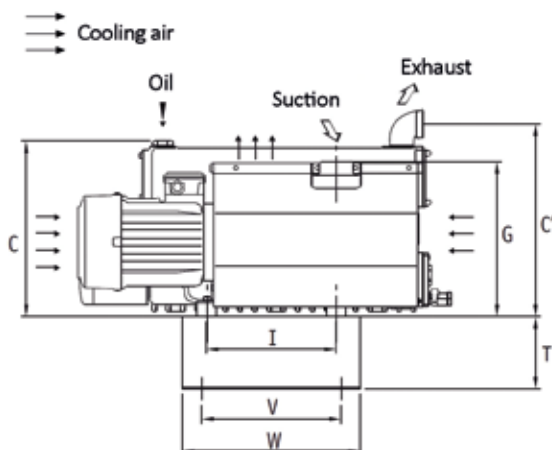
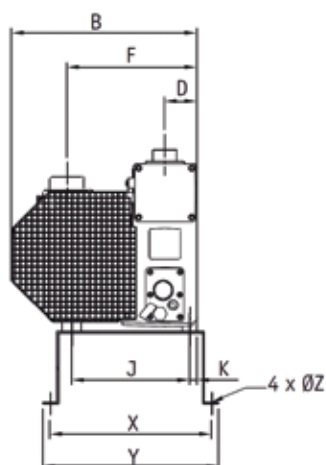


	UNIT	SSI17	SSI25	SSI40	SSI65	SSI100	SSI150	SSI200	SSI300	SSI350	SSI400	SSI500	SSI600
Pumping speed max. 50 Hz / 60 Hz	m³/h	16/ 19	28/ 33	41/ 49	63/ 75	94/ 112	147/ 176	185/ 222	263/ 315	341/ 409	410/ 492	496/ 595	597/ 716
Ultimate vacuum	mbar	0.5	0.5	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Ultimate vacuum with gas ballast HV/MV type	mbar	1.5/3	1.5/3	1.5/3	1.2/3	1.2/3	1.2/3	1.2/3	1.2/3	1.2/3	1.2/3	1.2/3	1.2/3
Rated power 50 Hz / 60 Hz	kW	0.55/ 0.66	0.75/ 0.9	1.1/ 1.3	1.5/ 1.8	2.2/ 2.64	3/ 3.6	4/ 4.8	5.5/ 6.6	7.5/ 9	9/ 10.8	11/ 13.2	15/ 18
Oil capacity	L	1.5	1.5	1.5	4	4	7	7	7	10	10	10	10
Noise level	dB (A)	59	60	62	65	67	70	71	73	74	74	74	75
Weight	kg	34	35	45	70	80	102	115	190	350	380	420	450

PERFORMANCE CURVES



DIMENSIONS (mm)



SSI17 - SSI25

SSI65 - SSI100 - SSI150

SSI40 - SSI200/300/350/400/500/600

	A	B	C	C'	D	E	F	G	H	H'	I	J
SSI17	535	296	276	290	60	97	212	253	123	-	148	189
SSI25	535	296	276	290	60	97	212	253	123	-	148	189
SSI40	620	293	276	290	60	126	212	253	152	152	185	189
SSI65	730	385	334	379	67	120	270	317	230	-	243	245
SSI100	780	385	334	379	67	120	270	317	230	-	269	245
SSI150	800	504	401	415	108	113	375	364	260	-	246	343
SSI200	890	504	401	415	108	149	375	364	295	295	266	343
SSI300	1060	584	421	436	145	259	450	386	363	363	318	412
SSI350	1360	680	544	614	145	260	510	510	408	458	376	462
SSI400	1400	680	544	614	145	331	510	510	477	477	376	462
SSI500	1460	680	544	614	145	364	510	510	512	512	376	462
SSI600	1655	680	544	611	145	411	512	510	558	558	376	462

	K	L	ØM	ØM'	ØE	ØS	T	V	W	X	Y	ØZ
SSI17	15	373	M8	M8	1"	1"	150	205	285	270	300	10
SSI25	15	373	M8	M8	1"	1"	150	205	285	270	300	10
SSI40	15	402	M8	M8	1"	1"	150	205	285	270	300	10
SSI65	15	600	M10	M8	1"1/4	1"1/2	150	290	370	335	365	11
SSI100	15	600	M10	M8	1"1/4	1"1/2	150	290	370	335	365	11
SSI150	20	600	M10	M10	2"	2"	150	290	370	430	460	11
SSI200	20	635	M10	M10	2"	2"	150	290	370	430	460	11
SSI300	25	820	M10	M10	2"	2"	150	440	500	590	620	12
SSI350	30	814	M10	M10	DN80	3"	200	440	500	790	820	12
SSI400	30	884	M10	M10	DN80	3"	200	440	500	790	820	12
SSI500	30	918	M10	M10	DN80	3"	200	440	500	790	820	12
SSI600	30	965	M10	M10	DN80	3"	200	440	500	790	820	12

ACCESSORIES / OPTIONS

- 1-ph/3-ph
- Suction filter (paper, polyester, carbon)/
Double suction filter
- Gas ballast
- Base frame
- Direct starter (with or without control panel)
- Double filtration aspiration
- Dust separator
- Cyclonic liquid trap
- Vacuum liquid trap
- Air cooler

EM SERIES

EM series pumps from Edwards are rugged mechanical oil-sealed pumps with speeds ranging from 80 to 275 m³/h. Compact and quiet, they feature advanced lubrication circuits, high reliability, and accessories to suit specific application needs.

The EM pumps incorporate a well proven positive pressure oil lubrication system which has been developed by Edwards to ensure correct lubrication in all duty modes and particularly to prevent oil starvation with high gas loads.

An integral oil pump ensures that a more than adequate oil flow is pumped throughout the stator/rotor assembly at all times.

The EM pumps have a gas ballast valve. The valve is used to introduce a suitable gas into the stator during the compression stage: this prevents condensation of vapors inside the pump, dilutes and ejects corrosive gases and purges the oil of gases and vapors. Therefore, the use of gas ballast reduces oil degradation and pump corrosion.

Every pump has protection devices to prevent oil and air suck-back into the vacuum system if the pump stops while under vacuum.

The EM pumps maintain Edwards's reputation for quiet operation pumps with a typical noise level of 75 dB(A).

All EM pumps are constructed with internal dowels, which reduce the need for skilled setting of tolerances, when the pump is dismantled. The pumps are designed so that all key components are easily accessible. The exhaust valve seals and oil distributor seals are exposed after the top cover is removed. The shaft seal can be replaced quickly without stripping down the pump.

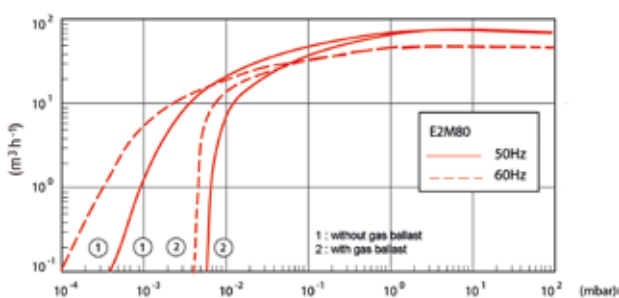


TECHNICAL DATA

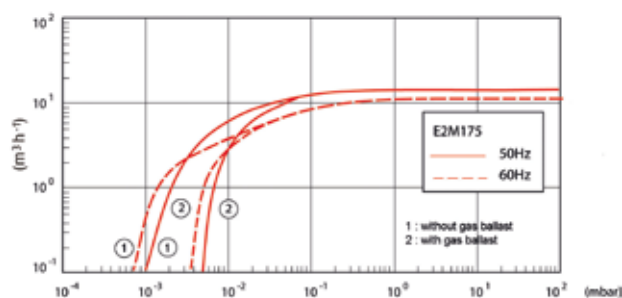
Motors: 200-240 V, 380-415 V three-phase

	UNIT	E2M80	E2M175	E2M275
Pumping speed max. 50 Hz/60 Hz	m ³ /h	80/96	178/214	292/350
Ultimate vacuum without/with gas ballast	mbar	1.10 ⁻³ /7.10 ⁻³	1.10 ⁻³ /7.10 ⁻³	5.10 ⁻³ /1.10 ⁻³
Rated power 50Hz/60 Hz	kW	2.2/3	5.5/6.5	7.5/8.5
Oil capacity	L	6.3	25	28
Flange IN	DN	40 ISO F	63 ISO F	63 ISO F
Flange OUT	DN	25 KF	40 ISO F	40 ISO F
Weight	kg	125	230	253

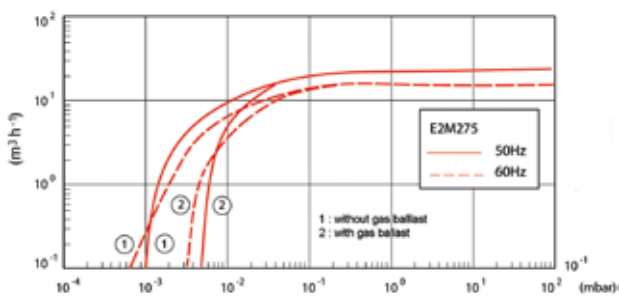
PERFORMANCE CURVES



E2M80

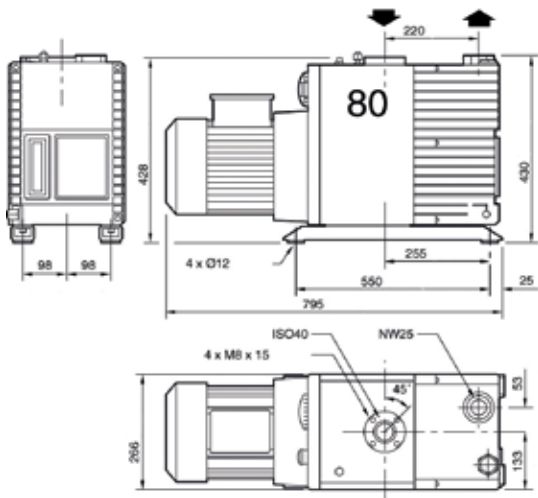


E2M175

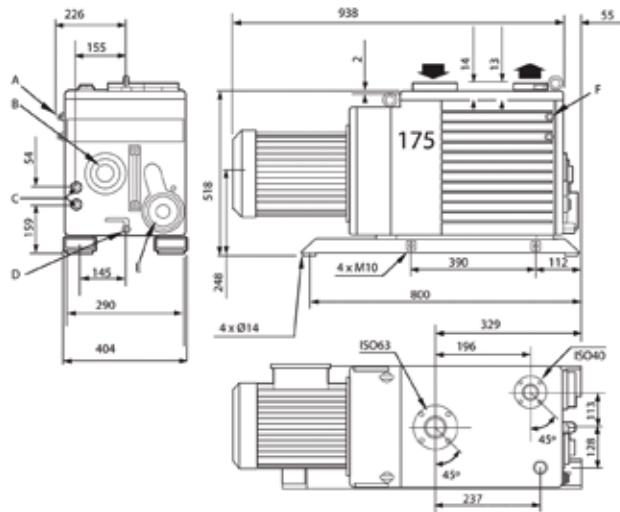


E2M275

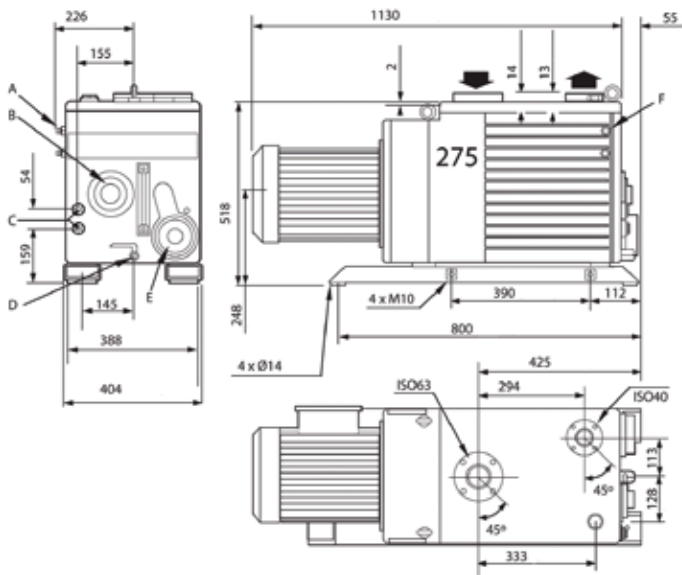
DIMENSIONS (mm)



E2M80



E2M175



E2M275

ACCESSORIES

Outlet Mist Filters, Outlet Catchpots, External Oil Filters, Inlet Dust Filters, Dust & Particulate Traps, Inlet Chemical Traps are provided on request.

Roots Pumps

OKTALINE SERIES: ROOTS PUMPS FOR EVERY LOW AND MEDIUM VACUUM APPLICATION

Roots pumps from Pfeiffer Vacuum offer pumping speeds ranging from 250 to 8000 m³/h. They can be safely employed for low and medium vacuum applications in the coating or semiconductor industry, in research & development, metallurgy or in chemistry and process technology.

The gear box and bearing area in our Roots pumps are separated from the gas pumping chamber. Because the rotors operate contact free, dry operation is assured.

A further advantage: Thanks to air cooling, operating costs are significantly lower than with water cooling. The pumps can be universally utilized.

The design principle of our proven Roots pumps has also been expanded to include magnetic couplings. Thanks to these hermetically sealed pumps we achieve very low leak rates. We have also developed ATEX certified pumps for processes that take place in explosive environments or for evacuating explosive gases.

OVERVIEW OF SERIES

Standard Okta series:

- Standard pumps (1 bar)
- Pumping speeds of 250 to 8000 m³/h
- Shaftseals
- Gray cast Iron

M series:

- Pumping speeds of 250 to 840 m³/h
- Hermetically sealed thanks to magnetic coupling

ATEX series:

- Explosion hazard protected: group II, device category 3 G, device group II B
- Pumping speeds of 500 to 4000 m³/h
- ATEX with motor magnetic coupling
- Blocked overflow-valve
- Pressure-surge resistant (16 bar)

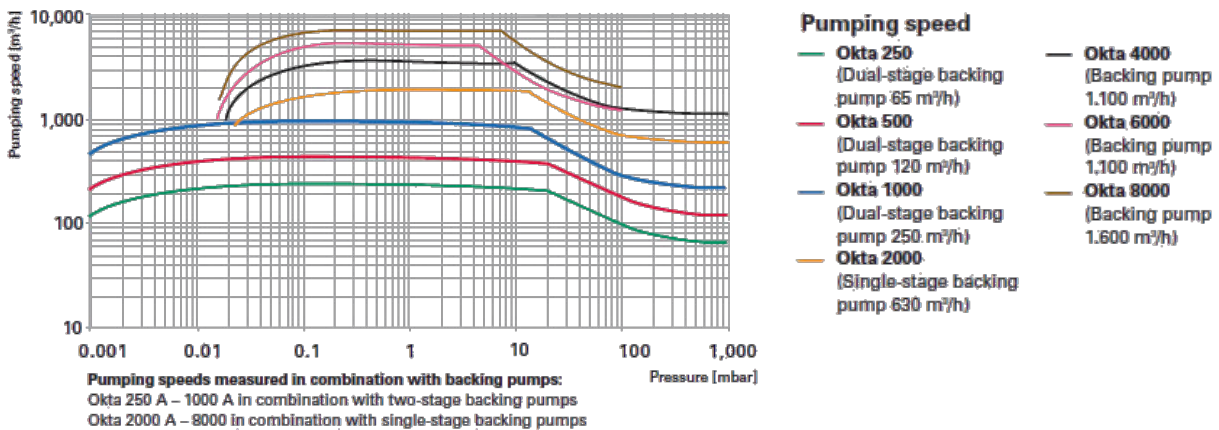


Standard OKTA Series

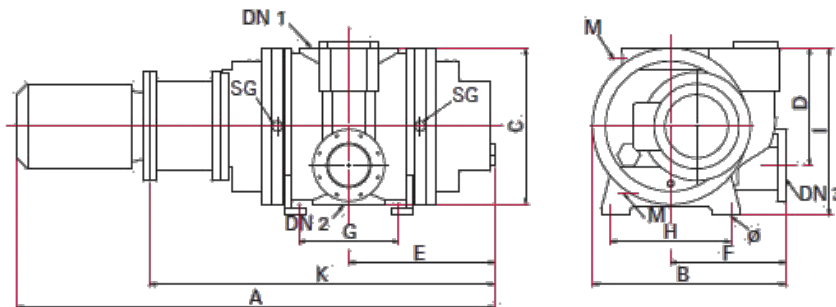
TECHNICAL DATA

		UNIT	OKTA 250	OKTA 500	OKTA 1000	OKTA 2000	OKTA 4000	OKTA 6000	OKTA 8000
Flange	IN	DN	63 ISO F	100 ISO F	160 ISO F	160 ISO F	250 ISO F	250 ISO F	320 ISO F
	OUT		63 ISO F	100 ISO F	100 ISO F	100 ISO F	160 ISO F	160 ISO F	320 ISO F
	OUT on the side		-	100 ISO F	100 ISO F	100 ISO F	160 ISO F	160 ISO F	250 ISO F
Pumping speed (50 Hz/60 Hz)		m ³ /h	290/350	560/670	1180/1420	2155/2585	4325/5190	6485/7785	8370/10040
Noise level (At intake pressure 1 mbar)		dB	70	70	72	72	74	74	74
Pump fluid filling		L	1.5	1.5	2.9	5	6.8	6.8	21
Motor rating (50 Hz/60 Hz)		kW	0.75/1.1	1.5/2.2	3/4	5.5/5.8	11/15	15/18.5	22/30
Voltage range		V	230/400	230/400	230/400	230/400	400	400	400
Weight		kg	95	132	250	340	640	840	1660

PERFORMANCE CURVES



DIMENSIONS (mm)



SG = Sealing gas connection 3/8"

	OKTA 250 ⁽¹⁾	OKTA 500	OKTA 1000	OKTA 2000	OKTA 4000 50 HZ	OKTA 6000	OKTA 8000
A	770	920	1.126	1.310	1.570	1.860	2156
B	323	323	446	502	655	655	860
C	280	280	360	420	510	510	765
D	-	-	270	325	390	390	645
E	220	275	337	373	453	578	637
F	-	-	266	292	400	400	510
G	170	170	230	250	400	400	600
H	220	220	280	360	450	450	600
I	285	285	385	440	542	542	810
K(A/AD)	517	627	784	886	1.069	1.319	1.428
Ø	12	12	11	18	18	18	18
DN 1	63 ISO F	100 ISO F	160 ISO F	160 ISO F	250 ISO F	250 ISO F	320 ISO F
DN 2	63 ISO F	100 ISO F	100 ISO F	100 ISO F	160 ISO F	160 ISO F	320 ISO F
DN 3	-	-	100 ISO F	100 ISO F	160 ISO F	160 ISO F	250 ISO F

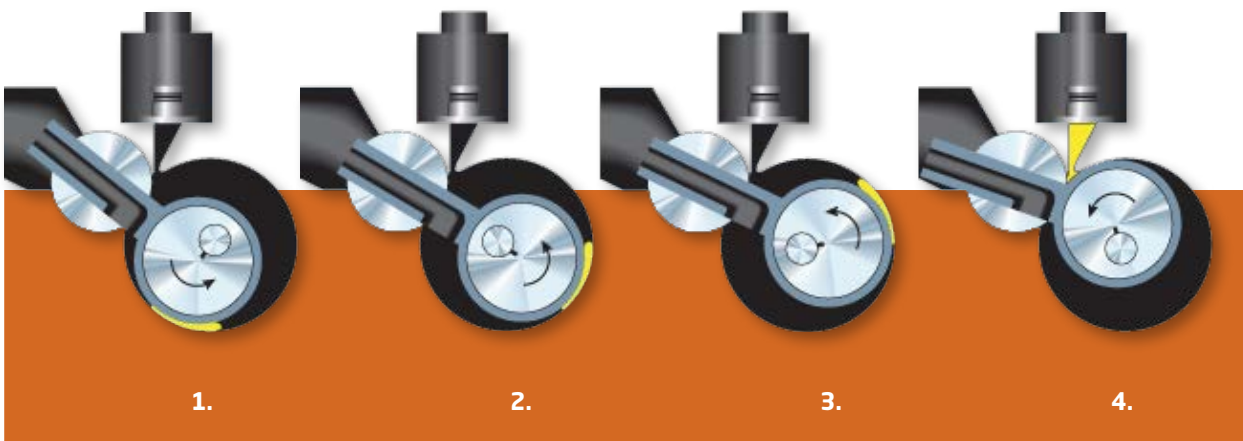


Rotary Piston Pumps

PRINCIPLES OF OPERATION

1. The rotary piston does not spin on its axis. It moves in a circular path within the pumping chamber.
2. As it passes top dead center, it creates a constantly increasing internal space on the inlet or suction side.
3. ...and a constantly decreasing internal space on the pressure or discharge side.
4. A high-integrity seal is maintained between the suction and pressure sides by a film of oil that is captured between the piston and the cylinder.
5. There is no contact between the piston and the cylinder.
6. The oil film is maintained by oil dragged into the clearance by the moving piston which creates a hydrodynamic wedge.
7. At the end of compression cycle, the clearance volume is completely filled with oil, making very high compression ratios available.

These three facts, the oil seal, the filling of the clearance volume, and no contact between piston and wall, are what give the rotary piston pump its low blank off, high pumping speeds at low pressures and great durability.



SINGLE-STAGE OR TWO-STAGE PUMPS

Depending on your application and what vacuum level you need to attain, Neyco rotary piston pumps are available in either single-stage or two-stage design. The two stage pumps will achieve a lower vacuum level due to the two piston chambers which are arranged in series with a connecting channel.

TRIPLEX DESIGN: VIBRATION-FREE OPERATION

Neyco Pumps have three sets of cams and pistons driven by a common shaft. One cam and piston set is no longer than the other two and the cams are set 180° apart. The dynamic forces produced by the rotation of the long cam and piston are balanced by opposing forces produced by the short cams and pistons on either side. The resulting out-of-balance force is very small, making it possible to mount the pump on springs or vibramounts which substantially reduce the dynamic forces transmitted to the floor.



HIGH PRESSURE OIL PUMPS ASSURE PROPER LUBRICATIONS

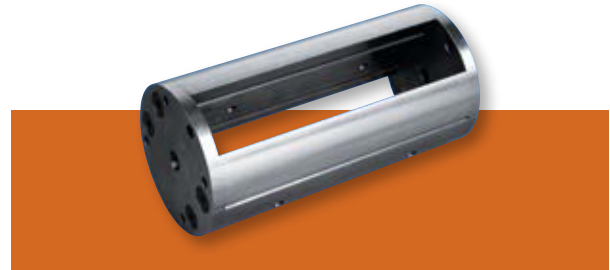
Pumps are lubricated by forced oil feed at all pressures. This forced feed ensures constant oil flow even at high suction pressures.

NO ANCHOR BOLTS

Our pumps do not require lagging, anchor bolts or special foundations and may be located on any floor that will support their weight.

STRONGER 4-PIECE CAGED SLIDE PINS

Slide pins in all Neyco rotary piston pumps have 4-pieced caged construction, with end pieces that keep both segments in perfect alignment.



APPLICATIONS

- R&D: Vacuum systems.
- Aerospace and aviation: test chambers, vacuum coating and brazing, cryogenic vessels, chilling, grain drying, fumigation, tobacco curing...
- Air conditioning and refrigeration: vacuum drying, degassing and fast leak detection.
- Automotive: vacuum forming and veneering of interiors, decorative and protective coatings, lamp production...
- Biological and drugs: freeze-drying, distillation and filtration.
- Chemical processing: vacuum dehydration, deaeration, purification, vacuum evaporation, drying, deodorizing...
- Electrical and electronic: evacuation of bulbs, potting of electronic components, vacuum coating, crystal growing and impregnation...
- Metallurgy: vacuum degassing, purification, melting, sintering, heat treating, welding, brazing, annealing, and impregnation...

NSPP SERIES

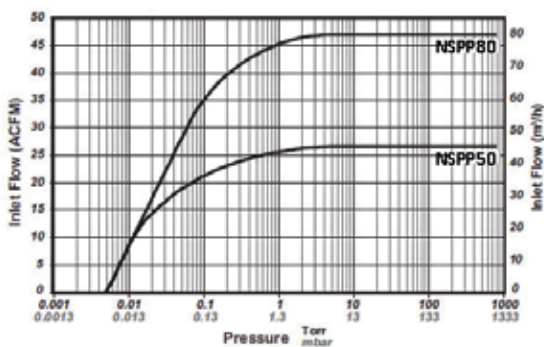
- Single-stage
- Can operate at any pressure up to atmosphere
- Ultimate pressure of 10^{-3} mbar
- High vapor handling
- High resistance to abrasion and corrosion
- No small orifices to plug up
- Adjustable gas ballast permits handling of condensable vapors



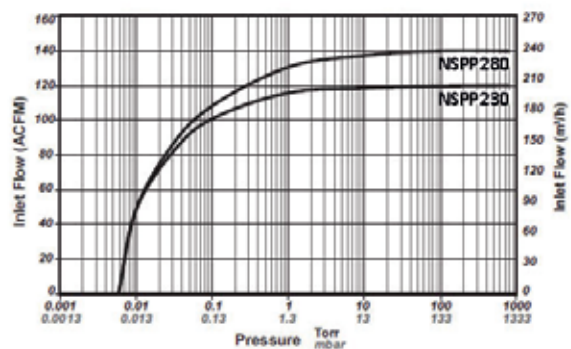
TECHNICAL DATA

MODEL	UNIT	NSPP50	NSPP80	NSPP230	NSPP280
Pumping speed	m ³ /h	56	88	227	280
Motor HP	kW	1	1.5	3.7	5.6
Oil capacity	L	3.8	11.4	22.7	22.7
Cooling water (16°)	l.min ⁻¹	AC	AC	3	3
Ultimate pressure	mbar	1.10^{-3}	1.10^{-3}	1.10^{-3}	1.10^{-3}
Typical noise level @ 10 mbar	dB (A)	75	80	70	72
Weight - dry	kg	91	104	331	381

PERFORMANCE CURVES

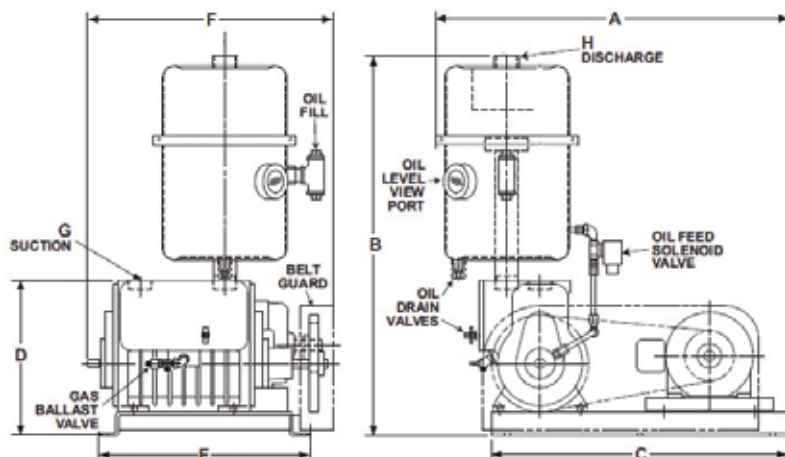


NSPP50, 80

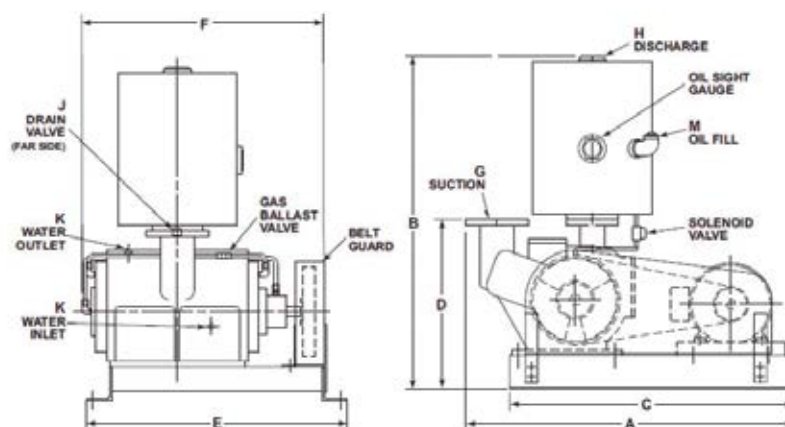


NSPP230, 280

DIMENSIONS (mm)



NSPP50, 80



NSPP230, 280

MODEL	A	B	C	D	E	F
NSPP50	518	686	432	327	400	508
NSPP80	727	826	622	327	441	508
NSPP230 NSPP280	987	997	854	508	783	719

NSPPT SERIES

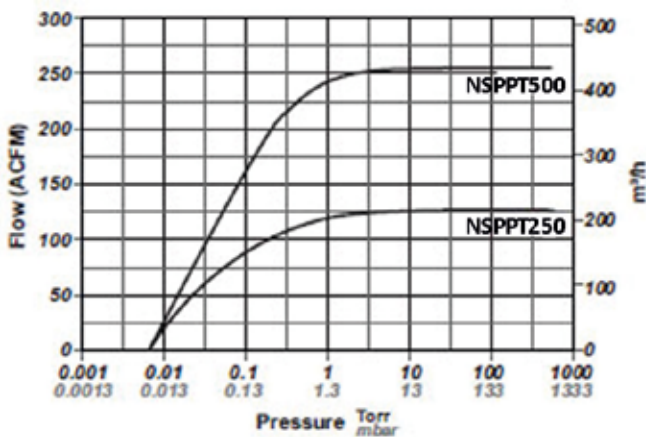
- Single-stage
- Triplex piston design for quiet, vibration-free operation
- Operate Continuously at any pressure up to 100 mbar
- Ultimate pressure of 10^{-3} mbar
- High vapor handling
- Simple installation. No special preparation necessary
- Adjustable gas ballast permits handling of condensable vapors



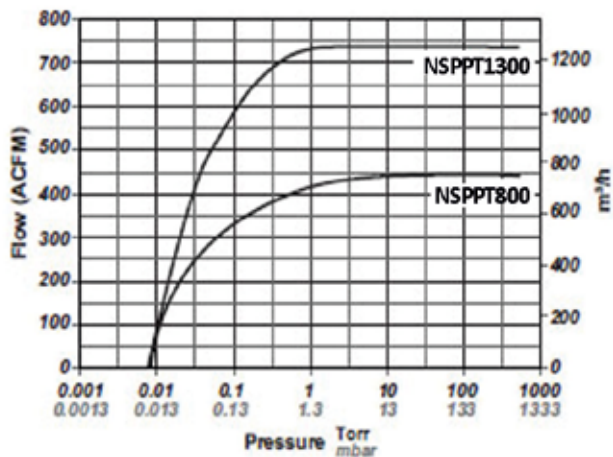
TECHNICAL DATA

MODEL	UNIT	NSPPT250	NSPPT500	NSPPT800	NSPPT1300
Pumping speed	m ³ /h	255	505	800	1325
Motor HP	kW	6	11	22	30
Oil capacity	L	23	38	57	106
Cooling water (16°)	l.min ⁻¹	4	6	9	13
Ultimate pressure	mbar	1.10^{-3}	1.10^{-3}	1.10^{-3}	1.10^{-3}
Typical noise level @ 10 mbar	dB (A)	71	72	73	75
Weight - dry	kg	364	693	1225	1996

PERFORMANCE CURVES

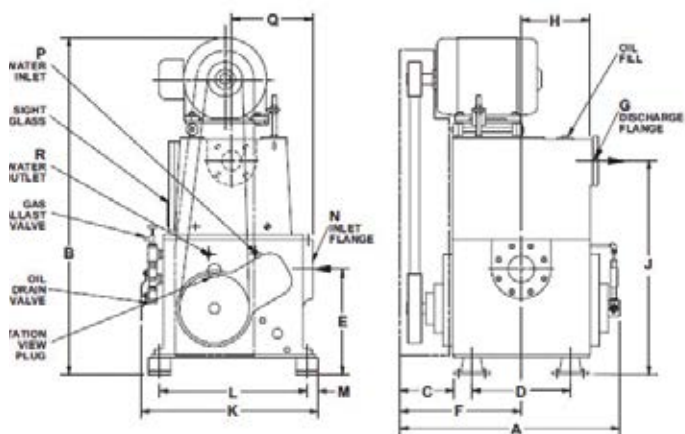


NSPPT250, 500



NSPPT800, 1300

DIMENSIONS (mm)



MODEL	A	B	C	D	E	F	G	J	K	L	M	N	P	R
NSPPT250	660	1092	219	298	321	368	51	673	578	486	30	76	1/4"	3/8"
NSPPT500	851	1302	267	381	406	470	76	826	589	572	43	102	3/8"	1/2"
NSPPT800	946	1604	298	432	546	540	102	1041	821	711	33	152	3/8"	1/2"
NSPPT1300	1232	1765	340	629	616	654	127	1168	946	838	29	203	3/8"	1/2"

NSPPL SERIES

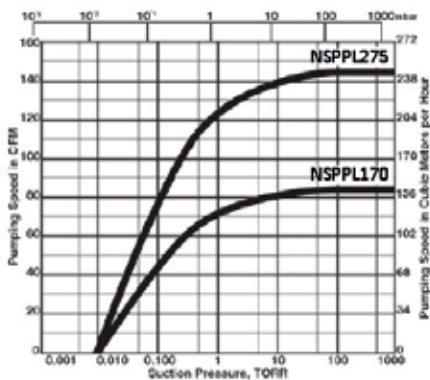
- The specifications are the same as for NSPPT series, with an integral oil mist eliminator.



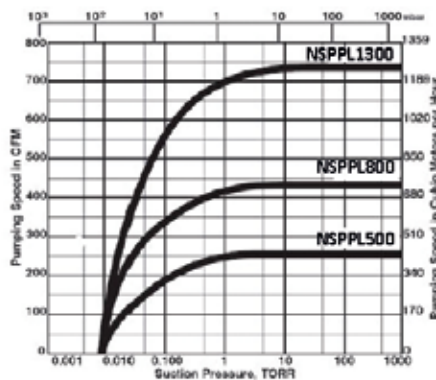
TECHNICAL DATA

MODEL	UNIT	NSPPL170	NSPPL275	NSPPL500	NSPPL800	NSPPL1300
Pumping speed	m ³ /h	170	275	505	840	1325
Motor HP	kW	3.7	7.5	11	22	30
Oil capacity	L	10	17	38	57	106
Cooling water (16°)	l.min ⁻¹	4	4	6	9	13
Ultimate pressure	mbar	1.10 ⁻³	1.10 ⁻³	1.10 ⁻³	1.10 ⁻³	1.10 ⁻³
Typical noise level @ 10 mbar	dB (A)	71	72	72	73	75
Weight - dry	kg	340	408	848	1660	1989

PERFORMANCE CURVES

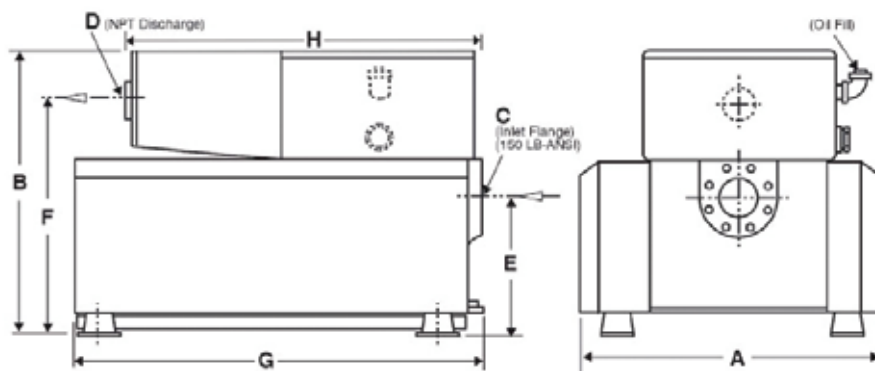


NSPPL170, 275

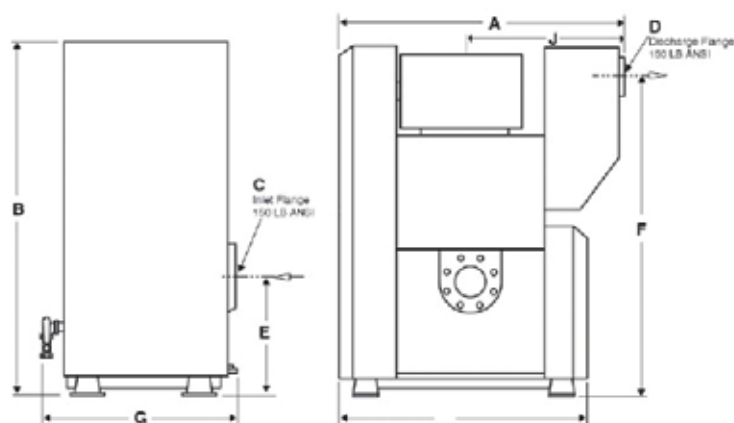


NSPPL500, 800, 1300

DIMENSIONS (mm)



NSPPL170, 275, 500



NSPPL800, 1300

MODEL	A	B	C INLET	D DISCHARGE	E	F	G	H	J
NSPPL170	629	626	3" NPT	2" NPT	330	533	946	919	-
NSPPL275	711	648	3" ANSI	2" NPT	349	552	1029	889	-
NSPPL500	895	861	4" ANSI	3" NPT/3" ANSI	425	699	1232	1124	-
NSPPL800	1270	1702	6" ANSI	4" ANSI	533	1556	838	391	724
NSPPL1300	1499	1975	8" ANSI	5" ANSI	616	1746	1000	464	816

N2PP & N2PPT SERIES - TWO-STAGE ROTARY PISTON PUMPS

N2PP SERIES

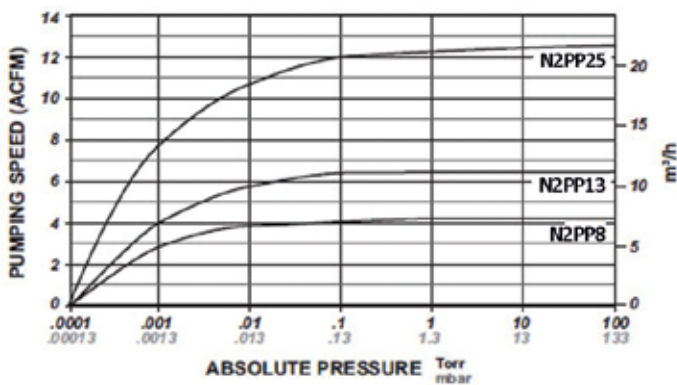
- Ultimate pressure of 10^{-4} mbar
- Can operate at any pressure up to atmosphere
- Adjustable gas ballast permits handling of condensable vapors
- No metal-to-metal contact in pumping chamber
- Air-cooled



TECHNICAL DATA

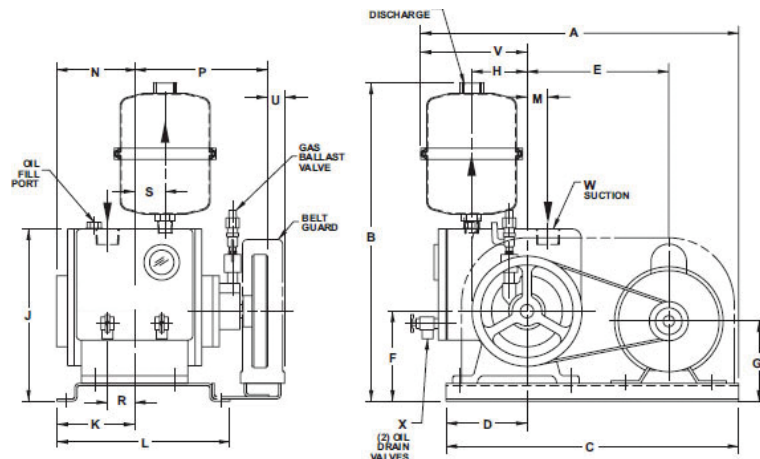
MODEL	UNIT	N2PP8	N2PP13	N2PP25
Pumping speed	m ³ /h	8.5	13.6	25.5
Motor HP	kW	0.25	0.56	0.75
Oil capacity	L	0.8	0.8	3
Cooling water (16°)	l.min ⁻¹	Air	Air	Air
Ultimate pressure	mbar	2.10^{-4}	2.10^{-4}	2.10^{-4}
Typical noise level @ 10 mbar	dB (A)	75	78	75
Weight - dry	kg	52	54	95

PERFORMANCE CURVES



N2PP8, 13, 25

DIMENSIONS (mm)



MODEL	A	B	C	D	E	F	G	H	J	K	L
N2PP8/13	456	454	419	116	203	129	114	251	246	111	248
N2PP25	514	617	432	101	229	152	140	254	325	203	400

MODEL	M	N	P	R	S	T	U	V	W	X
N2PP8/13	359	111	191	38	44	3/4" NPT	25	181	80	1/4" NPT
N2PP25	456	184	272	76	89	1 1/2" NPT	14	184	95	1/4" NPT

N2PPT SERIES

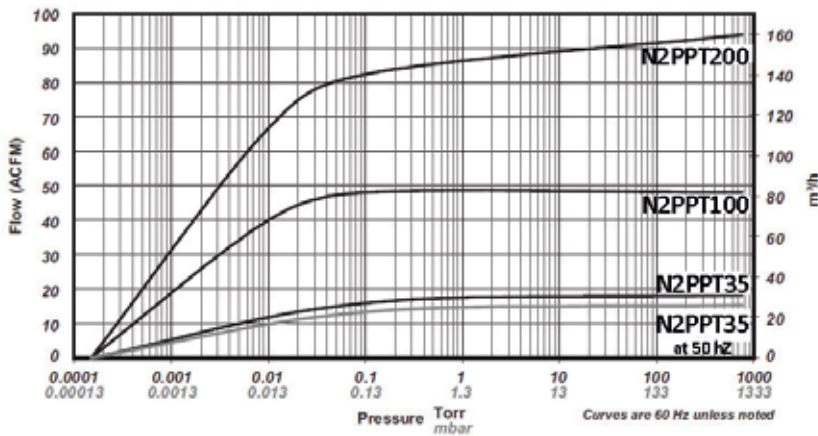
- Triplex piston design for quiet, vibration free operation
- Can operate at any pressure up to atmosphere
- Ultimate pressure of 10^{-4} mbar
- High vapor handling
- Adjustable gas ballast permits handling of condensable vapors
- No metal-to-metal contact in pumping chambers



TECHNICAL DATA

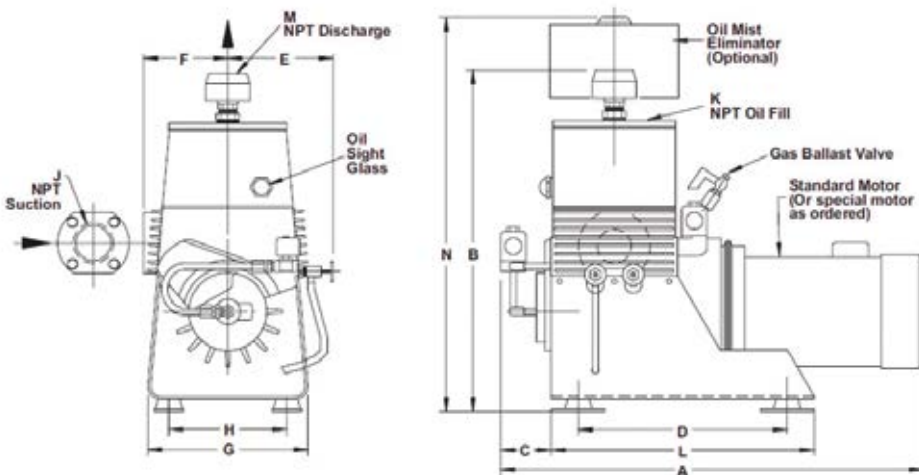
MODEL	UNIT	N2PPT35	N2PPT100	N2PPT200
Pumping speed	m ³ /h	36	102	182
Motor HP	kW	1.1	2.2	5.6
Oil capacity	L	0.8	0.8	3
Cooling water (16°)	l.min ⁻¹	Air	Air	5.7
Ultimate pressure	mbar	2.10^{-4}	2.10^{-4}	2.10^{-4}
Typical noise level @ 10 mbar	dB (A)	72	70	70
Weight - dry	kg	86	234	399

PERFORMANCE CURVES

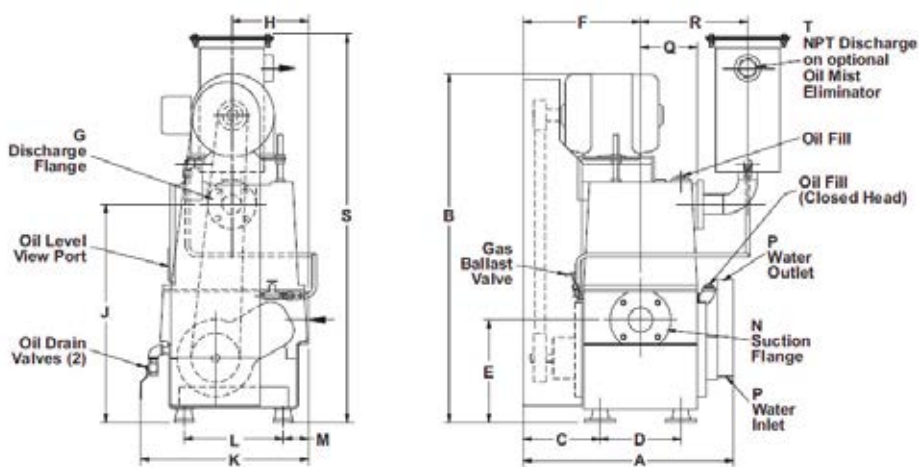


N2PPT35, 100, 200

DIMENSIONS (mm)



N2PPT35



N2PPT100, 200

MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R
N2PPT35	638	515	76	314	159	127	243	175	2" NPT	3/4" NPT	397	3/4" NPT	595	-	-	-
N2PPT100	591	927	213	254	498	349	1/4" FLG	194	552	476	292	64	3" FLG	-	157	292
N2PPT200	660	1092	241	254	321	368	2" FLG	241	695	527	311	79	3" FLG	1/4" NPT	178	337

Turbo Pumps

HiPace® 10 - 800 SERIES

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

- Robust design
- Minimal space needs
- Installation in any orientation⁽¹⁾
- Corrosive gas version available (C)
- Full range of accessories extends the possible uses

⁽¹⁾ HiPace 300 C: 0° to 90°



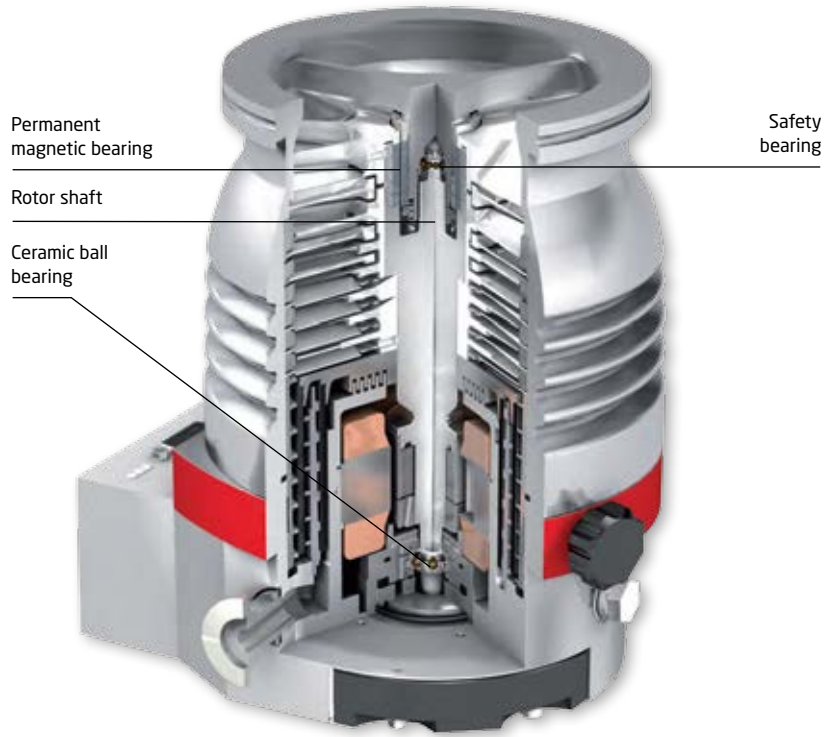
Turbopump HiPace 80 with ISO K flange



Turbopump HiPace 300 with CF flange

Hybrid bearing

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.



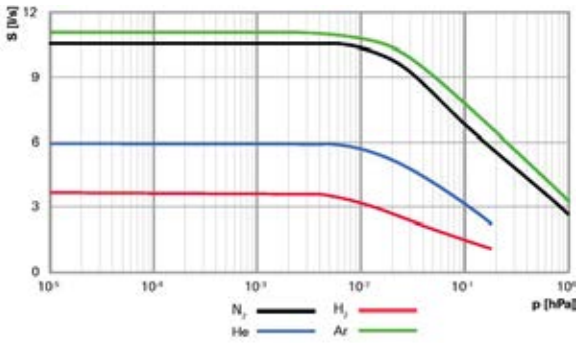
TECHNICAL DATA

	UNIT	HiPace 10	HiPace 80	HiPace 300	HiPace 400	HiPace 700	HiPace 800
Flange IN	DN	25 KF	63 ⁽¹⁾	100 ⁽¹⁾⁽²⁾⁽³⁾	100 ⁽¹⁾⁽²⁾⁽³⁾	160 ⁽¹⁾⁽²⁾⁽³⁾	200 ⁽¹⁾⁽²⁾⁽³⁾
Pumping speed for N₂	l/s	10	67	260	260	355	685
Compression ratio	N ₂	-	3.10 ⁶	> 1.10 ¹¹	> 1.10 ¹¹	> 1.10 ¹¹	> 1.10 ¹¹
	He	-	3.10 ³	1.3.10 ⁷	> 1.10 ⁸	3.10 ⁷	3.10 ⁷
	H ₂	-	3.10 ²	1.4.10 ⁵	9.10 ⁵	4.10 ⁵	4.10 ⁵
	Ar	-	2.5.10 ⁷	> 1.10 ¹¹	> 1.10 ¹¹	> 1.10 ¹¹	> 1.10 ¹¹
Ultimate vacuum	mbar	< 5.10 ⁻⁵	< 1.10 ⁻⁷	< 1.10 ⁻⁷	< 1.10 ⁻⁷	< 1.10 ⁻⁷	< 1.10 ⁻⁷
Cooling type, Standard	-	Convection	Convection	Air/Water	Water	Water	Water
Operating voltage	V DC	24 ± 5%	24 ± 5%	24 ± 5%	48 ± 5%	48 ± 5%	48 ± 5%
Max. power consumption	W	28.8	110	180/300	420	400	420
Weight	kg	1.8	2.4	5.8 - 8.2	11.6 - 17.5	11.5 - 17.4	12.8 - 19.1
Available with	integrated D.E.° TC-110	-	o	o	o	-	-
	integrated D.E.° TC-400	-	-	-	o	o	o
	integrated D.E.° TCP-350	-	-	o	o	o	o

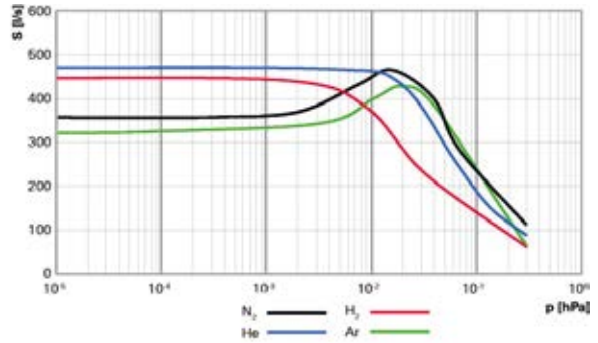
°D.E.: drive electronics

⁽¹⁾ ISO K ⁽²⁾ ISO F ⁽³⁾ CF-F

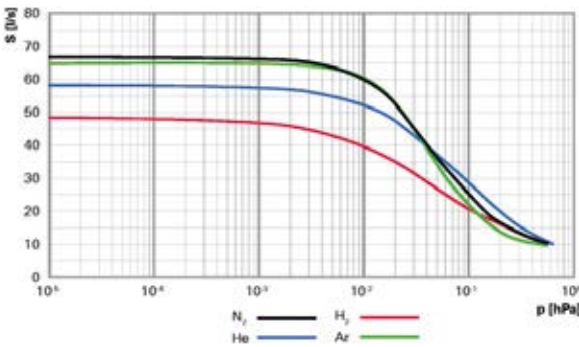
PERFORMANCE CURVES



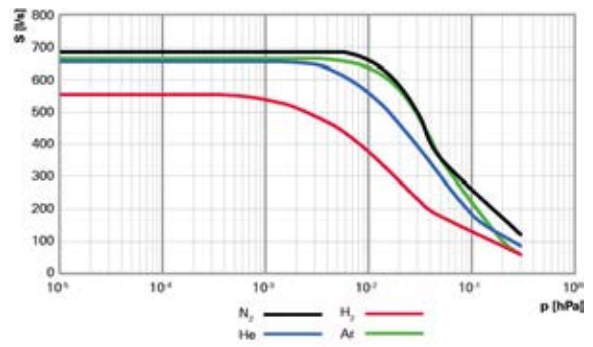
HiPace 10



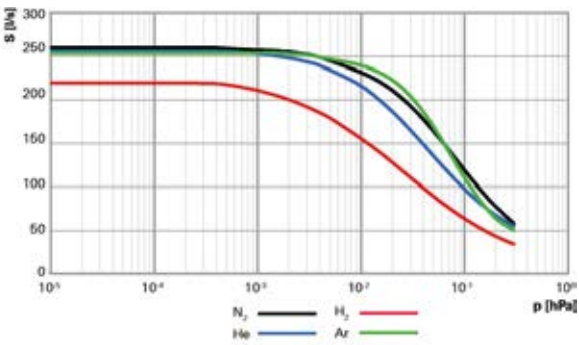
HiPace 400



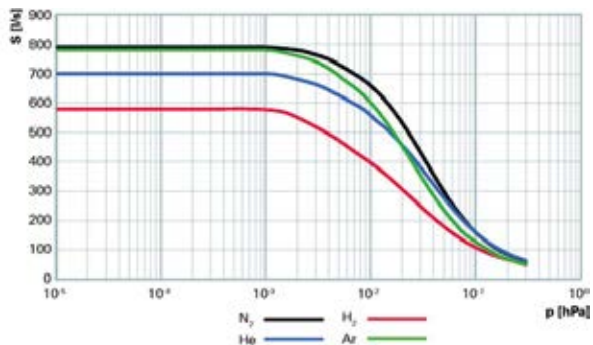
HiPace 80



HiPace 700

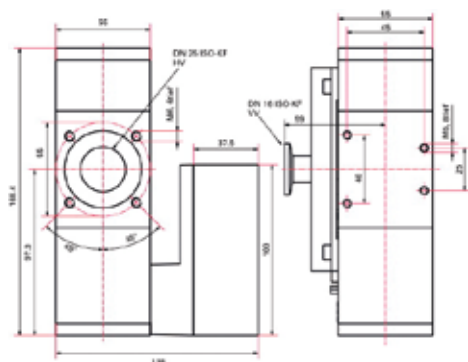


HiPace 300

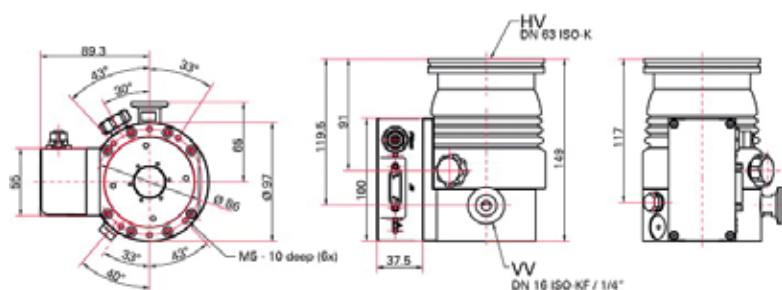


HiPace 800

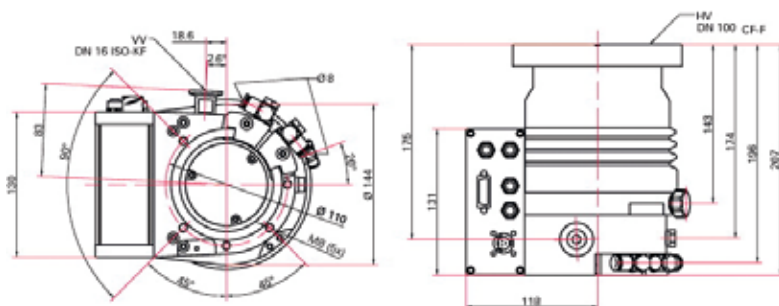
DIMENSIONS (mm)



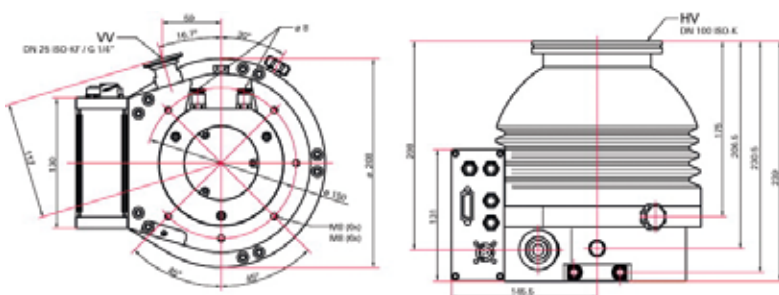
HiPace 10



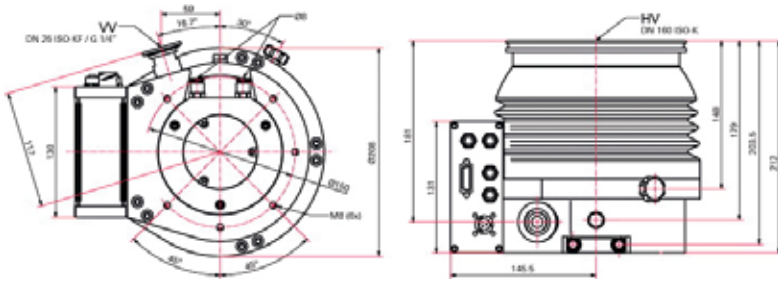
HiPace 80, 63 ISO K



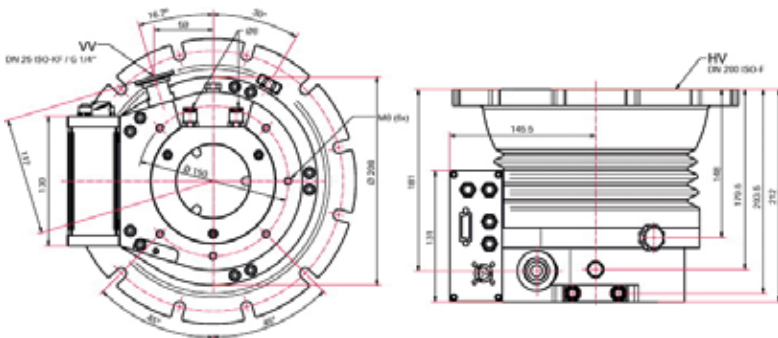
HiPace 300 with TC-400, 100 CF



HiPace 400 with TC-400, 100 ISO K



HiPace 700 with TC-400, 160 ISO K



HiPace 800 with TC-400, 200 ISO F

HiPace® 300 - 800 M, ATH 500 M SERIES

**Compact, magnetically levitated turbopumps
in the pumping speed class from 300 to 800 l/s.**

- High gas throughput
- Low vibration operation
- Low magnetic stray field
- Any mounting position
- Integrated drive electronics
- Available with Profibus, RS-485 or DeviceNet



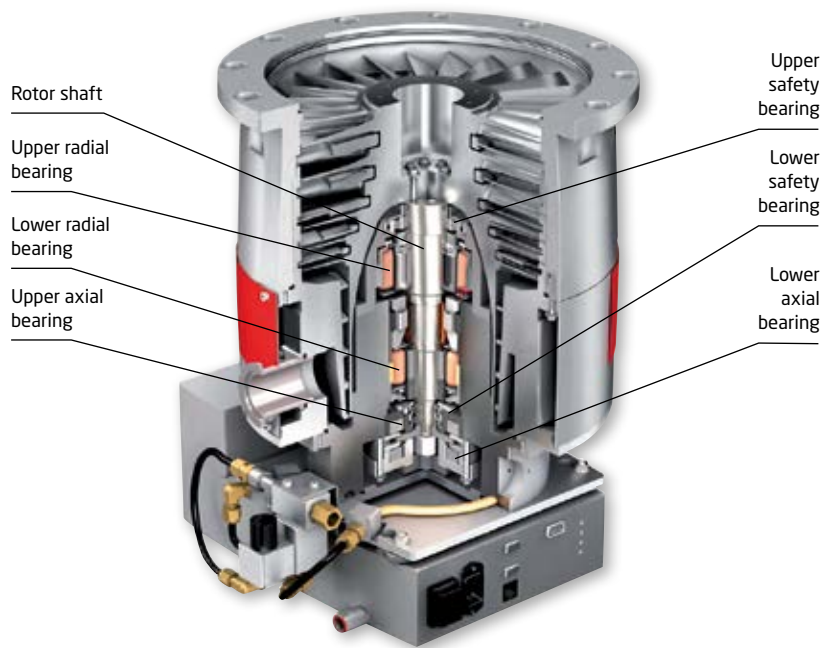
Turbopump ATH 500 M, with ISO F flange



Turbopump HiPace 800 M, with CF flange

Magnetic levitation

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.



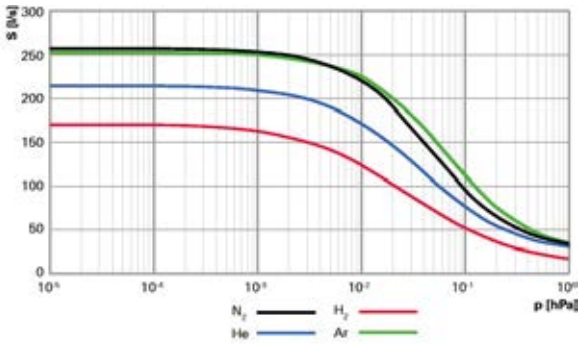
TECHNICAL DATA

	UNIT	HiPace 300 M	ATH 500 M	HiPace 700 M	HiPace 800 M	
Flange IN⁽¹⁾	DN	100	100/160	160	200	
Pumping speed for N₂	l/s	255	520	685	790	
Compression ratio	N ₂	-	> 1.10 ¹¹	> 2.10 ⁷	> 1.10 ¹¹	> 1.10 ¹¹
	He	-	> 1.10 ⁸	> 1.10 ⁴	> 1.10 ⁷	> 1.10 ⁷
	H ₂	-	5.10 ⁸	> 2.10 ²	2.10 ⁵	2.10 ⁵
	Ar	-	> 1.10 ¹¹	> 8.10 ⁶	> 1.10 ¹¹	> 1.10 ¹¹
Ultimate vacuum	mbar	< 1.10 ⁻⁷	< 1.10 ⁻⁸	< 1.10 ⁻⁷	< 1.10 ⁻⁷	
Cooling type, Standard	-	Water	Water	Water	Water	
Operating voltage*	V DC	48 ±5%	48 ±5%	48 ±5%	48 ±5%	
Max. power consumption	W	300	550	300	300	
Weight	kg	13.1 - 17.2	17 - 18	15.7 - 20.8	17.1 - 21.5	

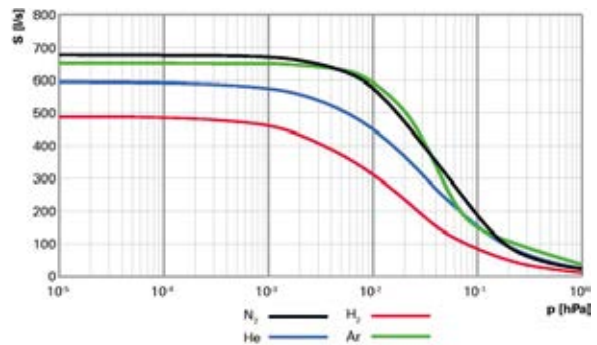
* with drive electronics

⁽¹⁾ available with ISO K or ISO F or CF-F

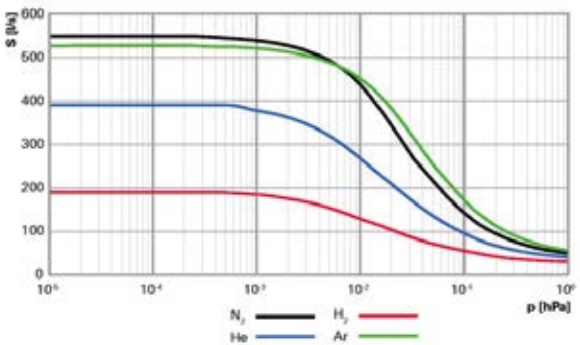
PERFORMANCE CURVES



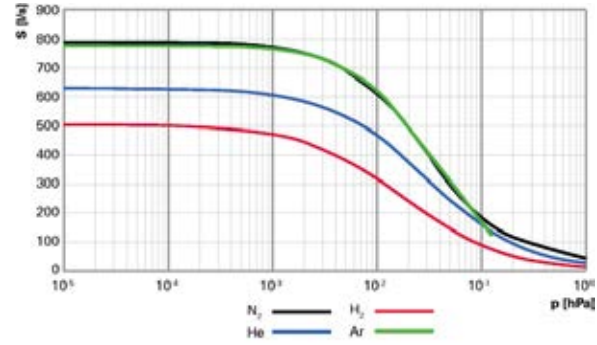
HiPace 300 M



HiPace 700 M

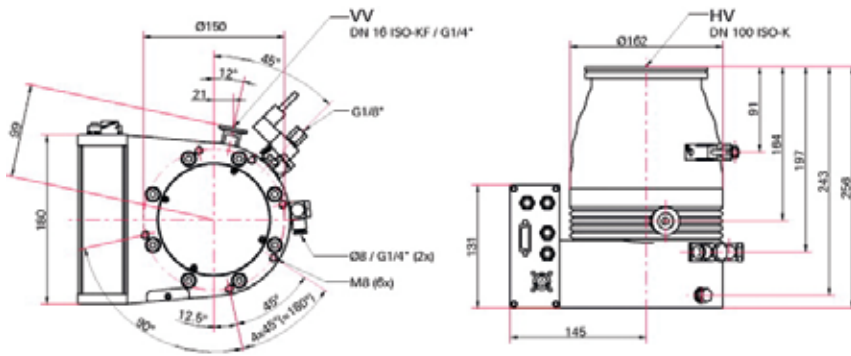


ATH 500 M

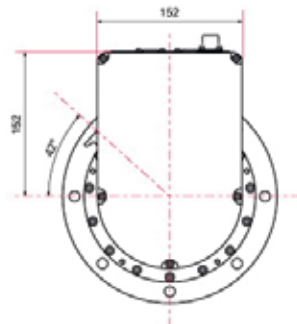
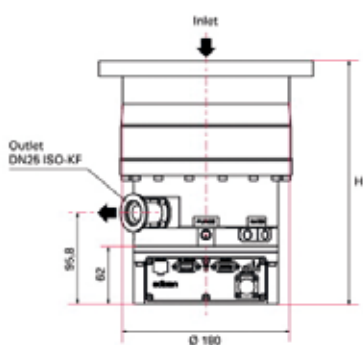


HiPace 800 M

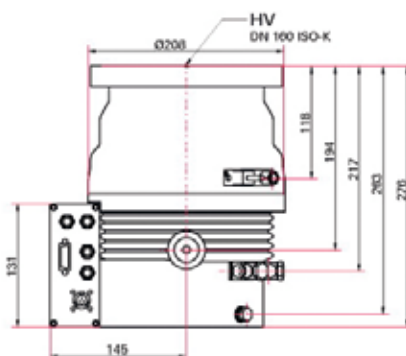
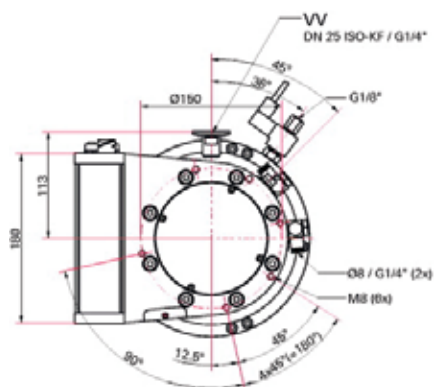
DIMENSIONS (mm)



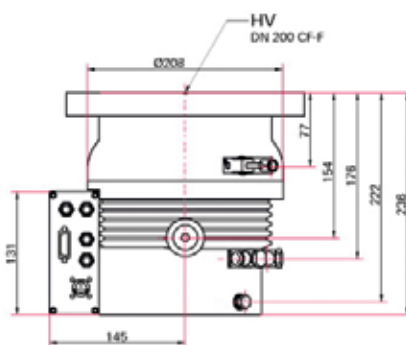
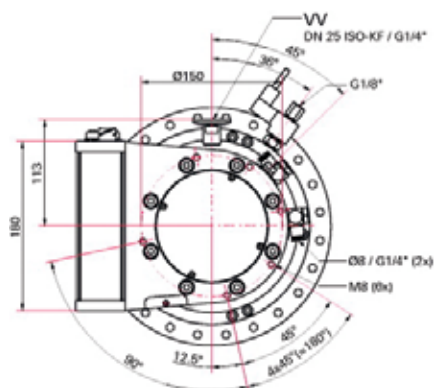
HiPace 300 M, 100 ISO K



ATH 500 M, 160 ISO F



HiPace 700 M, 160 ISO K



HiPace 800 M, 200 CF

Turbo Pumping Stations

Neyco offers a wide range of vacuum pumping stations from Pfeiffer Vacuum. They consist of different pump combinations and are complemented by appropriate components, valves and measuring instruments. The modular HiCube series pumping stations are characterized by the combination of a HiPace series turbopump with a dry or oil-sealed backing pump which is designed for the requirements specific to the application.

HiCube 80 Eco

**Bench top air-cooled turbo pumping station with dry diaphragm vacuum pump.
For all applications in the high-vacuum.**

- Plug and play pumping station
- Compact and economical
- Flexible design
- Versatile accessories
- Display control unit with integrated gauge connection

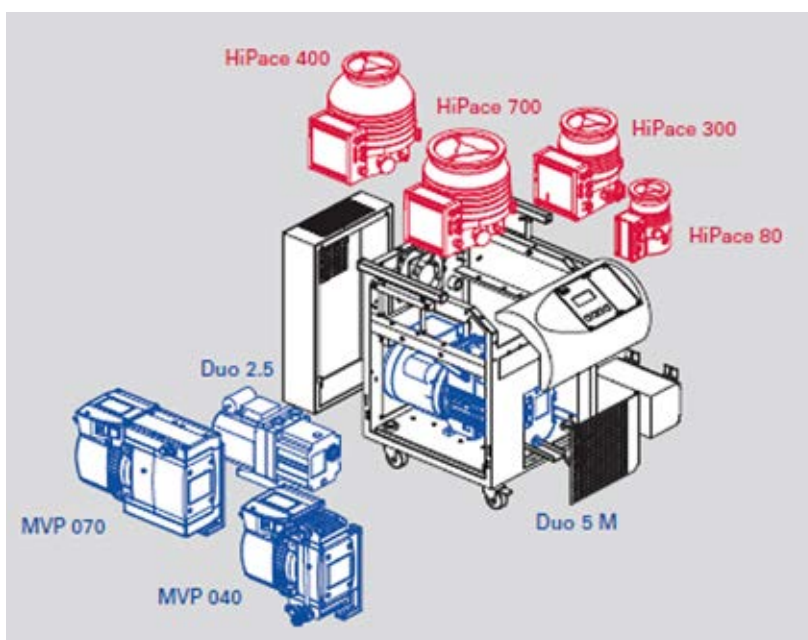


	UNIT	40 KF	63 ISO K/CF-F
Power consumption	W	230	
Voltage (range)		110 V, 50/60 Hz; 230 V, 50/60Hz	
Pumping speed for N ₂	l/s	35	67
Pumping station components		HiPace 80, MVP 015-2, TPS 110, DCU 002	
Ultimate vacuum	mbar	< 1.10 ⁻⁷	
Weight	kg	17	

HiCube™ TURBO PUMPING STATIONS

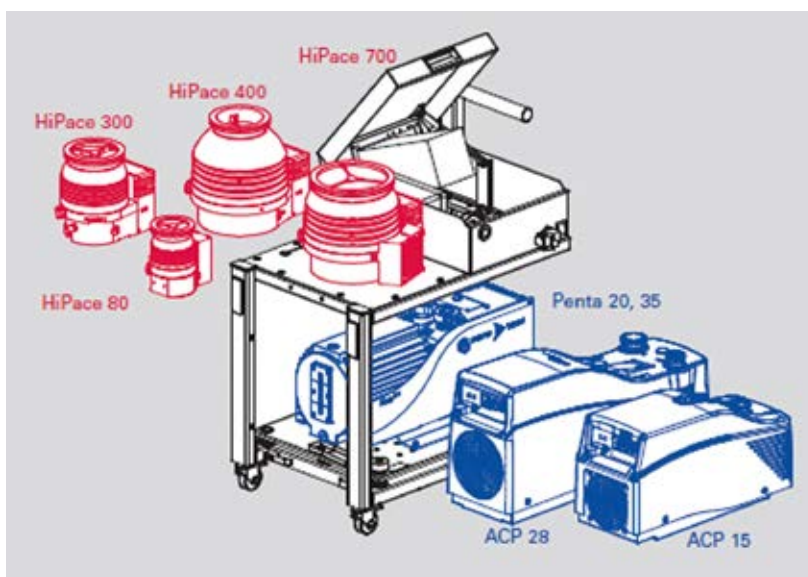
- Sturdy frame featuring modern design
- Turbopump with integrated drive
- Backing pump on vibration-isolated intermediate frame
- Modern worldwide power supply in accordance with applicable standards
- Backing pump control
- Electromagnetic venting valve
- DCU control unit
- Air cooling standard
- Oil filling (for rotary vane pumps)

HiCube CLASSIC



PUMPING STATION		UNIT	HiCube 80 CLASSIC	HiCube 300 CLASSIC	HiCube 400 CLASSIC	HiCube 700 CLASSIC
Weight pumping station	with Diaphragm pump MVP 040	kg	36.4	43.2	-	-
	with Diaphragm pump MVP 070	kg	41.4	48.2	57.5	57.9
	with Rotary pump Duo 2.5	kg	35.5	42.3	51.6	52.0
	with Rotary pump Duo 5M	kg	44.0	50.8	60.1	60.5
Power consumption	with Diaphragm pump MVP 040	W	290	480	-	-
	with Diaphragm pump MVP 070	W	360	550	670	670
	with Rotary pump Duo 2.5	W	270	460	580	580
	with Rotary pump Duo 5M	W	360	550	670	670

HiCube PRO



PUMPING STATION		UNIT	HiCube 80 PRO	HiCube 300 PRO	HiCube 400 PRO	HiCube 700 PRO
Weight pumping station	with Diaphragm pump MVP 040	kg	60.2	67.0	76.3	76.7
	with Diaphragm pump MVP 070	kg	69.2	76.0	85.3	85.7
	with Rotary pump Duo 2.5	kg	82.2	89.0	98.3	98.7
	with Rotary pump Duo 5M	kg	84.2	91	100.3	100.7
Power consumption	with Diaphragm pump MVP 040	W	660	850	970	970
	with Diaphragm pump MVP 070	W	1160	1350	1910	1910
	with Rotary pump Duo 2.5	W	1100	1290	1410	1410
	with Rotary pump Duo 5M	W	1585	1775	1895	1895

Diffusion Pumps

Oil diffusion pumps have many applications in high-vacuum technology, for example in metallising systems, metallurgical facilities, vacuum ovens, laboratory pumping stations and many more.

- Pump range available in the nominal sizes from DN 40 to DN 1000
- Air and water cooled oil diffusion pumps
- High volume flow rates
- Good pre-vacuum stability
- Low blowing gas backflow
- Continual self-cleaning of the fuel in the purification zone
- Ideal for mineral oil (Invoil 20, Invoil 30), silicone oil (NE-702, NE-704, NE-705) or pentaphenylether (Santovac 5)

AIR / WATER COOLED SMALL DIFFUSION PUMPS

- Integrated water baffle
- Compact construction
- Available either with air or water cooling
- Voltage available in 115 V or 230 V



Air-cooled diffusion pump

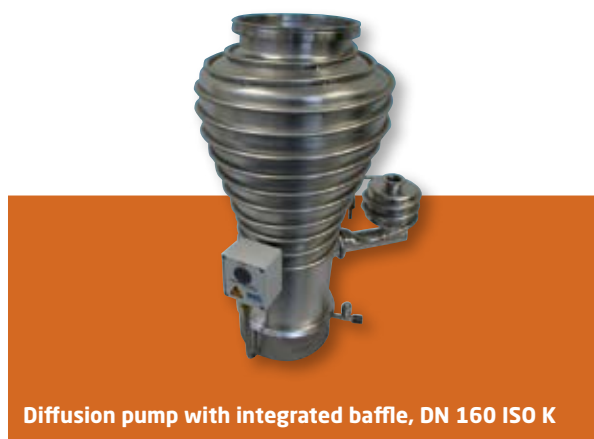
		UNIT	40 KF	40 KF
Cooling		-	Air	Water
Pumping speed for air at 10 ⁻⁴ mbar	without baffle	l/s	38	40
	with baffle	l/s	22	22
Built-in thermal protection switch		-	-	Yes
Vacuum stability		mbar	0.3	0.3
Pump fluid charge min/max		cm ³	10/15	10/15

Spare parts: Seal set, Heating plate.

DIFFUSION PUMPS WITH INTEGRATED BAFFLE

This range has the significant characteristic of having a visually non-transparent baffle integrated into the pump casing. The pump casings are made of non-rusting Stainless Steel and the extendable spray system for cleaning is made of pressed Aluminum.

- Compact construction
- Integrated water baffle
- Pump body and adapter flange made of rust-free steel



Diffusion pump with integrated baffle, DN 160 ISO K

	UNIT	63 ISO K	100 ISO K	160 ISO K	250 ISO K
Pumping speed for air at 10 ⁻⁴ mbar	l/s	150	300	650	1750
Pump fluid charge min/max	cm ³	50/70	80/120	150/300	450/1000
Power consumption	W	400	650	1275	2400
Thermostatic cut		Integrated	Integrated	Integrated	Integrated
Weight	kg	4	8.5	14.5	30

Spare parts: Seal set, Heating ring

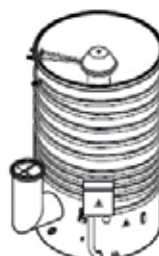
Accessories: Thermal switch, Cooling water monitor without fittings, Orifice for flow monitor

DIFFUSION PUMPS WITH COLD CAP OR BAFFLE CAP

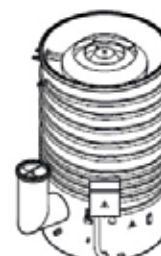
This range of pumps possesses a volume flow rate from 5.000 to 50.000 l/s for N₂ and is particularly appropriate for industrial high-vacuum applications.

For applications in the working-range of 10⁻⁴ mbar, our diffusion pumps are fitted with the so-called baffle cap which, beside its advantages regarding high volume flow rate and high gas throughput, also has a low fitting height and an exceptionally economical price.

- Robust design
- Low end-pressure
- Low energy usage through pre-vacuum baffle
- Short warming-up phase
- Voltage available in 3 x 400 V or 3 x 230 V



PDA: Diffusion pumps with Cold Cap



PDB: Diffusion pumps with Baffle Cap

	UNIT	320 ISO K	400 ISO K	500 ISO K	630 ISO K	800 ISO F	1000 ISO F
Pumping speed for air at 10⁻⁴ mbar PDA/PDB	l/s	3500/-	5000/4200	7500/6000	5000/13000	23000/20000	40000/34000
Pump fluid charge min/max	cm ³	1200/1800	2000/3000	3500/5000	6000/8000	7000/13000	16000/24000
Power consumption	kW	4.4	5.4	7.2	10.5	17.4	25.2
Weight	kg	55	75	180	250	480	700

Spare parts: Seal set, Heating plate



Diffusion pump DN 630 ISO K

ACCESSORIES

Thermal switch

- For interlocking or controlling the pumping system peripheral equipment
- The thermal relay closes when the diffusion pump is ready for operation

Thermostatic Cut-Out

- Protects DIF 320 - 1000 from overheating
- To cut out the electrical power
- Manual resetting

Temperature sensor DIF 320-1000

- With spring mechanism for optimized contact
- Bajonet fixation

Feedthrough to diffusion pumps

- The feedthrough mounted at the oil drain connection

DIF oil temperature display unit

Pump fluid replenishing device

- For replenishing pump fluid in processes with high gas throughput
- Refilling is possible while pump is running
- Visual level control on the glass tube

Flow monitor

- For monitoring the cooling water flow
- Flow monitors are installed at the outlet of the cooling water circuit of the diffusion pump

WATER BAFFLE

- Baffle water cooling only

	UNIT	320 ISO K	400 ISO K	500 ISO K	630 ISO K	800 ISO K	1000 ISO K
Conductance for molecular flow	l/s	4300	7000	9000	16000	24500	42500
Cooling water consumption	l/h	20	25	32	42	52	65
Weight	kg	15.7	21.8	55	60	152	205

COMBINATION BAFFLE

- Cooling with refrigerator (R134a) or water, Polycold
- LN₂ (Liquid Nitrogen) separate cooling circuit
- Increasing the pumping speed for water vapor if cooled with LN₂ or Polycold

	UNIT	320 ISO K	400 ISO K	500 ISO K	630 ISO K	800 ISO F	1000 ISO F
Pumping speed for water vapor with LN ₂ cooling, Polycold	l/s	11000	17500	24000	47000	71000	110000
Conductance for molecular flow	l/s	3500	5500	6500	12500	16500	33000
LN ₂ consumption	Cooling to -180°C	kg	3	4.5	6	8	25
	Continuous operation	kg/h	1.6	2.4	3.6	5.7	11
Weight	kg	21	26.5	98	117	225	300

Accessories: Refrigerator, Automatic LN₂ supply for baffles.

Helium Leak Detectors

Helium leak detectors from Pfeiffer Vacuum are the ideal solution for leak detection and leak-tightness testing under vacuum. The test gas Helium is safe and a small, light molecule which is suitable for detecting micro leaks. The detection range of Helium in vacuum tests lies between 10^{-1} and 10^{-12} mbar.l/s. Helium leak detection is extremely accurate, quantitative and repeatable. Fast cycle times are a further advantage.

ASM 142 SERIES

The ASM 142 series leak detectors can be used both for qualitative localization of leaks as well as for quantitative global or local testing. Their high performance, reliability and user-friendliness ensure the end user complete confidence in the selection of the unit for the rigors of industrial leak detection. The ASM 142 series can be adapted to

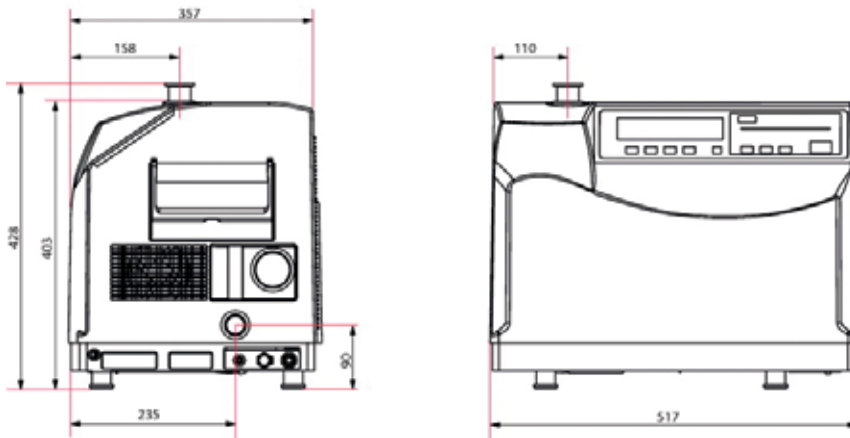
specific applications with the aid of extensive accessories such as 3-mass option for Hydrogen leak testing.

- Test method: vacuum and sniffing leak detection
- Operating voltages available for worldwide employment
- Basic user interface and voice synthesizer in English

Backing pump	with oil sealed backing pump
Backing pump capacity	10 m ³ /h
Detectable gases	He
Pumping speed for He	1.3 l/s
Dimensions (L x W x H)	517 x 357 x 428 mm
Flange IN	25 KF
Minimum detectable leak rate for He (vacuum leak detection)	$5 \cdot 10^{-12}$ mbar.l/s
Minimum detectable leak rate for He (sniffing leak detection)	$1 \cdot 10^{-7}$ mbar.l/s
Weight	56 kg

Options

- Graphic color touch screen
- Oil free leak detection with diaphragm backing pump
- Interface board for automation through an external system (PC or PLC)
- Sniffer probe, 5 m hose length
- Remote control
- Transport cart, 2 wheels

**DIMENSIONS (mm)****ASM 310 SERIES**

The ASM 310 portable Helium leak detector stands out particularly due to its smart design with a retractable handle and its small footprint. At only 21 kg it is still a complete vacuum system, it has the same detector technology and offers the same level of sensitivity as larger models. Thanks to the clean, oil-free pumping system, the ASM 310 is the right choice for leak detection in systems which do not tolerate any contamination. The ASM 310 can be operated in any position and has an integrated SD memory card for data recording.

- Test method: vacuum and sniffing leak detection
- Smart design with retractable handle
- Detachable control panel, with magnets enabling it to be positioned on a metallic support
- Large bright color touchscreen with graphics functionality
- Universal voltage: 100-240 V AC - 50/60 Hz

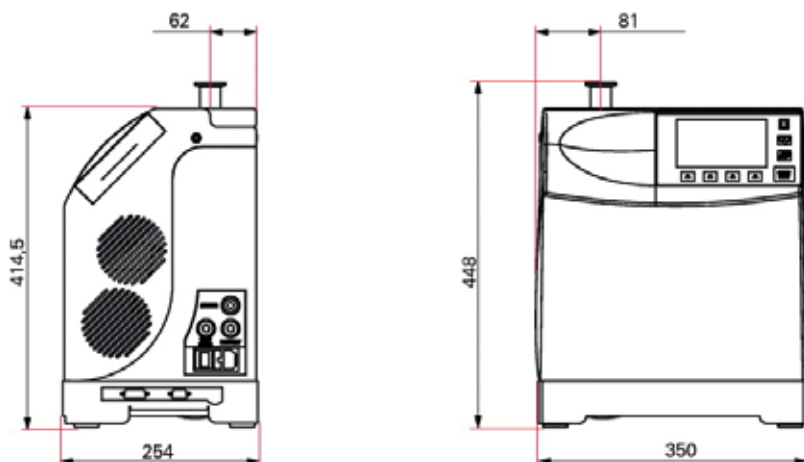
Roughing pump capacity	1.7 m ³ /h
Detectable gases	He, H ₂
Pumping speed for He	1.1 l/s
Dimensions (L x W x H)	350 x 245 x 414 mm
Flange IN	25 KF
Minimum detectable leak rate for He (vacuum leak detection)	5·10 ⁻¹² mbar.l/s
Minimum detectable leak rate for He (sniffing leak detection)	1·10 ⁻⁷ mbar.l/s
Weight	21 kg

Options

- Remote control
- Sniffer probe, 5 m or 10 m hose length
- Helium spray gun
- Trolley
- Transportation case



DIMENSIONS (mm)





N

VACUUM OILS & GREASES

- Mechanical Pumps Fluids N 02
- Diffusion Pumps Fluids N 06
- Vacuum Greases and Sealants N 11
- VacSeal High Vacuum Leak Sealant & Cement N 16
- NYE Greases for Severe Applications N 17
- Perfluorosolv PFS-1/PFS-2 Cleaning Solvents ... N 20

Mechanical Pumps Fluids

Neyco offers a complete line of mechanical oils for all pump types and vacuum applications. Benefits of proper pump fluid selection include longer pump life and less backstreaming which leads to a cleaner vacuum system and increased productivity. Our strict quality control procedures insure a product that is recommended by major manufacturers.

These fluids include :

- Mineral oils: these fluids are distillation and refining products extracted from petroleum.
- Fluids based on Perfluoropolyether (PFPE): they consist of Carbon, Fluorine and Oxygen atoms.

This wide selection ensures that we can supply the proper fluid for your application.

MINERAL OILS	VAPOR PRESSURE AT 25°C (mbar)	BOILING POINT AT 10 ⁻² mbar (°C)	VISCOSITY AT 40°C (cSt)	DENSITY AT 25°C (g/ml)
Inland 19	1.10 ⁻⁵	112	55	0.86
Invoil 20	< 1.10 ⁻⁶	127	58	0.86
Inland TW	< 1.10 ⁻⁶	158	65	0.86
Inland 45	1.10 ⁻⁷	133	53	0.83
Inland 100+	5.10 ⁻⁵	138	100	0.87

PFPE PRODUCTS	VAPOR PRESSURE AT 25°C (mbar)	BOILING POINT AT 10 ⁻² mbar (°C)	VISCOSITY AT 40°C (cSt)	DENSITY AT 25°C (g/ml)
Fomblin Y6/6	3.10 ⁻⁶	> 250	64	1.88
Fomblin Y14/6	2.10 ⁻⁷	> 250	148	1.89
Fomblin Y16/6	2.10 ⁻⁶	> 250	168	1.89
Fomblin Y25/6	4.10 ⁻⁸	> 250	276	1.90
Inland geminYe 6	4.10 ⁻⁷	> 250	62	1.88
Inland geminYe 14	2.10 ⁻⁷	> 250	142	1.89
Inland geminYe 16	2.10 ⁻⁷	> 250	168	1.89
Inland geminYe 25	1.10 ⁻⁷	> 250	261	1.90
Inland geminYe SV	5.10 ⁻⁹	> 250	200	1.90

INLAND 19

Inland 19 is recommended for use in non-corrosive applications. Through molecular distillation light end fractions are removed, resulting in lower vapor pressures and reduced backstreaming compared to undistilled refinery products. These properties allow Inland 19 to be

used with more expensive diffusion pump fluids that are normally contaminated when combine with lesser fluids. Compared to refinery fluids Inland 19 offers reduced maintenance costs, better pumping cycles, longer fluid life, and a cooler running pump.

INVOIL 20

Invoil 20 is the standard mechanical pump fluid used in applications involving corrosive or reactive gases. This fluid has been distilled to remove the majority of the light fractions present in all raw material feedstock. The removal of these fractions slows the degradation process and reduces the rate of sludge accumulation in the mechanical pump. Actual field use indicates that

Invoil 20 tends to extend the useful service life of the fluid anywhere from 5 to 10 times that of standard hydrocarbon fluid. Invoil 20 can also be used as diffusion pump fluid. This represents a great advantage by allowing users to establish a homogenous system and thus prevents any cross-contamination.

INLAND TW

Inland TW fluid is specifically recommended for applications where exposure to reactive or corrosive gasses is prevalent. These products are distilled USP grade hydrocarbon oil. Both unsaturates and aromatics have been removed to result in a longer lasting, superior fluid. They also contain an excellent additive package for thermal and chemical resistance. Typical applications

include nitride decomposition, LPCVD, plasma etch, and ion implantation. When compared to Invoil 20, Inland TW will last 1.5 - 4 times longer and exhibit:

- Corrosive service
- High thermal stability
- High oxidation stability
- Reduced backstreaming

INLAND 45

Inland 45 synthetic hydrocarbon fluid permit strain-free cold starts as a result of their low pour point and high viscosity index (i.e. viscosity is lower than that of typical pump fluids at low temperatures). In addition, because these fluids maintain their viscosity at high temperatures, it provides a good seal under full-load conditions. Among other properties offered by Inland 45's unique molecular

structure are chemical resistance and high temperature stability superior to those of other high performance oils, such as white oils; and low vapor pressure.

Non toxic, non corrosive, Inland 45 is compatible with Buna-N, neoprene and Viton elastomers; and miscible with petroleum based oils, Freon, aromatic solvents, and flushing fluids.

INLAND 100+

Inland 100+ is a general purpose hydrocarbon fluid designed for use in rotary vane piston pumps. Its high viscosity provides the necessary lubrication and sealing required for piston pumps in non-corrosive applications. This fluid is not recommended for high oxygen concentrations or corrosive materials.



SPECIFICATIONS	UNITS	INLAND 19	INVOIL 20	INLAND TW	INLAND 45	INLAND 100+
Vapor pressure at 25°C	mbar	1.10 ⁵	3.10 ⁶	< 1.10 ⁶	< 1.10 ⁷	< 5.10 ⁵
Boiling point at 10 ⁻² mbar	°C	112	127	158	133	138
Viscosity at 40°C	cSt	55	58	65	53	100
Viscosity at 100°C	cSt	8.1	8.5	9.1	7.0	9.9
Pour point	°C	-15	-10	-12	-59	-9
Flash point	°C	213	224	243	264	257
Fire point	°C	244	259	270	288	291
Density	g/ml	0.86	0.86	0.86	0.83	0.88
Packaging	-	1 L/5 L/19 L	1 L/5 L/19 L	1 L/3.8 L/5 L/19 L	1 L	5 L/19 L/209 L

FOMBLIN YL-VAC

Fomblin vacuum pump fluids are non-flammable, chemically inert, and thermally stable. When used with proper pump filtration, Fomblin PFPE fluids provide exceptionally long service life. These fluids have excellent lubricity properties and are available in viscosity grades suitable for use in all vacuum pumps.

- Low vapor pressure
- Chemical inertness
- High thermal stability
- Good lubricating properties
- No flash or fire point
- Low toxicity
- Excellent compatibility with metals, plastics, elastomers
- Good aqueous and non-aqueous solvent resistance
- High dielectric properties
- Low surface tension
- Good radiation stability
- Environmentally acceptable

INLAND *geminYe* PFPE OILS LOW VAC GRADES

geminYe PFPE family of lubricants are non-flammable, chemically inert and thermally stable. *geminYe* fluids have excellent lubricity properties and are available in viscosity grades suitable for use in all vacuum pumps. When used with proper filtration, *geminYe* fluids provide exceptionally long service life. They are a less expensive alternative to the Fomblin range.

geminYe PFPE inert fluids are also available with antirust protection. *geminYe* 06RP, 14RP, 16RP, 25RP, SVRP, all have the same properties of the standard fluids. The additive enhances the performance of *geminYe* RP oils, giving them long-term antirust properties repel moisture, providing extra protection from corrosion of metal parts and bearing surfaces.

- Low vapor pressure
- Oxygen compatible
- Non-flammable
- Solvent resistant
- Low relative weight loss
- Chemically inert
- Excellent compatibility with metals, plastics, elastomers
- CFC-free - Ozone friendly
- Corrosion resistant
- High thermal stability
- High dielectric properties
- No flash or fire point
- Reclaimable

SPECIFICATIONS	UNITS	FOMBLIN				<i>geminYe</i>					
		Y06/6	Y14/6	Y16/6	Y25/6	6	14	16	25	SV	SVRP
Vapor pressure at 25°C	mbar	3.10 ⁻⁶	2.10 ⁻⁷	2.10 ⁻⁶	4.10 ⁻⁸	4.10 ⁻⁷	2.10 ⁻⁷	2.10 ⁻⁷	1.10 ⁻⁷	5.10 ⁻⁹	5.10 ⁻⁹
Boiling range	°C	> 250	> 250	> 250	> 250	> 250	> 250	> 250	> 250	> 250	> 250
Viscosity at 20°C	cSt	64	148	168	276	62	142	168	261	200	200
Pour point	°C	-50	-45	-45	-35	-60	-54	-45	-48	-38	-38
Flash point	°C	None	None	None	None	None	None	None	None	None	None
Fire point	°C	None	None	None	None	None	None	None	None	None	None
Density	g/ml	1.88	1.89	1.89	1.90	1.88	1.89	1.89	1.90	1.90	1.90
Packaging	-	1 kg	1 kg	1 kg	1 kg	1 kg	1 kg	1 kg	1 kg	1 kg	1 kg



geminYe 25

Diffusion Pumps Fluids

The ideal diffusion pump oil would be thermally stable, non-volatile, chemically inert and non-toxic. Real diffusion pump fluids, on the other hand, represent compromises between these properties; no one fluid does it all. Neyco offers a broad range of diffusion pump oils, including

hydrocarbon, inert PFPE, polyphenyl ether and silicone fluids for a wide range of applications. These fluids include distilled hydrocarbons, silicones, organic esters and other synthetics. This wide selection ensures that we can supply the proper fluid for your application.

PRODUCTS	VAPOR PRESSURE AT 25°C (mbar)	BOILING POINT AT 10 ⁻² mbar (°C)	VISCOSITY AT 40°C (cSt)	DENSITY AT 25°C (g/ml)
NE-702	3.3.10 ⁻⁶	190	26.8	1.07
NE-704	2.10 ⁻⁸	220	24.2	1.07
NE-705	2.4.10 ⁻⁹	250	66	1.09
Fomblin Y18/8	2.10 ⁻⁸	-	*190	*1.89
Fomblin Y25/9	2.10 ⁻⁹	-	*285	*1.89
Inland geminYe 18-8	2.10 ⁻⁸	-	*180	*1.89
Inland geminYe 25-9	2.10 ⁻⁹	-	*270	*1.90
Santovac 5	4.10 ⁻¹⁰	200	307	1.20

*At 20°C

MINERAL OILS	VAPOR PRESSURE AT 25°C (mbar)	BOILING POINT AT 10 ⁻² mbar (°C)	VISCOSITY AT 40°C (cSt)	DENSITY AT 25°C (g/ml)
Invoil	2.10 ⁻⁶	126	27	0.98
Invoil 20	3.10 ⁻⁶	127	58	0.86
Invoil 30	5.10 ⁻⁶	127	58	0.86
Invoil 46	< 10 ⁻⁸	129	65	1.90

SILICONE FLUIDS NE-702 / NE-704 / NE-705

Neyco's NE-702, NE-704 and NE-705 diffusion pump fluids are designed for high vacuum and for fast pumping of large volumes of gas or vapor in production operations.

NE-702

NE-702 is a general-purpose fluid designed for fast pumping of large volumes of gas. It is used to produce vacuums in the range of 10^{-5} to 10^{-7} mbar. It is also used in vapor ejector pumps that attain vacuums of 10^{-4} to 10^{-5} mbar. It has the important advantage of thermal stability. This silicone based fluid is resistant to air at operating temperatures, so the pumps require no cooling between cycles.

NE-704

NE-704 is a single-component fluid for high vacuums of 10^{-6} to 10^{-8} mbar (untrapped) and 10^{-9} to 10^{-10} mbar (trapped). It performs well in tough, rugged applications and offers quick pumpdown, even after exposure to air at operating temperatures. This fluid's low vapor pressure and thermal stability make it popular in processes such as vacuum coating, metallurgical work, and various other applications.

NE-705

NE-705 is a colorless to straw-colored, single-component fluid designed for ultra-high vacuum applications in the range of 10^{-9} to 10^{-10} mbar (untrapped) and 10^{-11} mbar (trapped). The vapor pressure and backstreaming rate of NE-705 are so low that use of traps or refrigeration is unnecessary for some ultrahigh and ultraclean vacuum applications. It has the highest phenyl content of all silicone diffusion pump fluids and the best resistance to radiation.

SILICONE

NE-704

Diffusion Pump Fluid

NET : 5 KG

LOT : xxxxx

CAS - 3982-82-9

SPECIFICATIONS	UNITS	NE-702	NE-704	NE-705
Ultimate vacuum untrapped	mbar	10^{-6}	10^{-6} to 10^{-8}	10^{-9} to 10^{-10}
trapped		-	to 10^{-10}	to 10^{-11}
Vapor pressure at 25°C	mbar	4.10^{-6}	6.10^{-8}	3.10^{-9}
Boiling point at 10^{-2} mbar	°C	190	220	250
Viscosity at 40°C	cSt	26.8	24.2	66
Viscosity at 100°C	cSt	6.2	6.2	9.82
Pour point	°C	< 0	< -9	< 0
Flash point	°C	193	> 210	243
Fire point	°C	None	None	None
Density	g/ml	1.07	1.07	1.09
Packaging	-	500 cc/5 kg/20 kg	500 cc/5 kg/20 kg	500 cc/3.5 L

FOMBLIN YH-VAC

Fomblin YH-VAC fluids are suggested for applications requiring a high quality vacuum such as in scanning electron and transmission microscopes, mass spectrometers, particle accelerators, ion implantation, plasma and vapor

deposition processes, etc. In addition, it is recommended for pumps handling reactive gases such as UF₆, UF₂, Oxygen, Ozone, Tritium, etc. Direct contact with these gases will not result in any type of reaction or fluid degradation.

INLAND *geminYe* PFPE OILS HIGH VAC GRADES

geminYe PFPE family of lubricants are non-flammable, chemically inert and thermally stable. *geminYe* fluids have excellent lubricity properties and are available in viscosity grades suitable for use in all vacuum pumps.

When used with proper filtration, *geminYe* fluids provide exceptionally long service life.

SPECIFICATIONS	UNITS	FOMBLIN		<i>geminYe</i>	
		Y18/8	Y25/9	18-8	25-9
Vapor pressure at 20°C	mbar	2.10 ⁻⁸	2.10 ⁻⁹	2.10 ⁻⁸	2.10 ⁻⁹
Viscosity at 20°C	cSt	190	285	180	270
Pour point	°C	-10	-10	-42	-35
Flash point	°C	None	None	None	None
Fire point	°C	None	None	None	None
Density	g/ml	1.89	1.89	1.89	1.90
Packaging	-	1 kg	1 kg	1 kg	1 kg

INVOIL

The Invoil fluid is specially distilled for use in diffusion pumps where pressure of 10⁻⁷ mbar is required. It's a

standard fluid for mass spectrometers, leak detectors, distillation systems, and electron microscopes.

INVOIL 20

Invoil 20 is also a high quality, general purpose hydrocarbon diffusion pump fluid that works well in any diffusion pump. The fluid is designed to meet the

vapor pressure requirements of a diffusion pump while exhibiting excellent thermal stability. Invoil 20 can also be used in a mechanical pump.

INVOIL 30

Invoil 30 is a specially developed diffusion pump fluid which is double distilled. This hydrocarbon is modified for high temperature use with a strong antioxidant. Invoil 30

can be used in applications such as metallizing, optical and microelectric coatings, sputtering, and metallurgy.

INVOIL 46

Invoil 46 is a synthetic (arylalkyldiphenylether) diffusion pump fluid whose performance combines the best properties of silicones and polyphenyl ethers. It was developed to accommodate the performance requirements of such applications such as CRT evacuation, optical coatings, evaporation and sputtering, vacuum metallurgy, leak detection, and mass spectrometry.

As a result of its unique chemical structure, Invoil 46 offers excellent thermal stability and radiation resistance. It can attain untrapped pressures near 10^{-8} mbar. It's ability to recover from accidental exposure to atmosphere during normal operation is comparable to that of silicon pump fluids. In addition, deposits formed in the even of ionization or breakdown of the fluid are conductive and do not accumulate static charges.

SPECIFICATIONS	UNITS	INVOIL	INVOIL 20	INVOIL 30	INVOIL 46
Vapor pressure at 25°C	mbar	2.10^{-6}	3.10^{-6}	5.10^{-6}	5.10^{-8}
Boiling point at 10^{-2} mbar	°C	126	127	127	129
Viscosity at 40°C	cSt	27	58	58	65
Viscosity at 100°C	cSt	3.9	8.5	8.5	9.0
Pour point	°C	-52	-10	-10	-20
Flash point	°C	196	224	241	260
Fire point	°C	229	259	271	None
Density	g/ml	0.98	0.86	0.86	0.90
Packaging	-	60 cc/1 L	1 L/5 L/19 L	1 L/5 L/19 L	100 cc/1 L

SANTOVAC 5

Santovac 5 is polyphenyl ether synthetic diffusion pump fluid capable of producing ultra-high vacuum in the 10^{-10} mbar range. Due to this fluid's extremely low vapor pressure, backstreaming characteristics are lower than any other fluid resulting in less contamination and longer operation. Santovac 5 has exceptionally low volatility and is thermally stable, non-halogenated water white fluids. It exhibits extraordinary resistance to degradation from heat, oxygen, radiation and chemical attack. This lubricant is designed for applications where extremely high temperatures and adverse environments are expected. It is compatible with most metals and elastomers commonly used in vacuum pumps.

Santovac 5 is ideal for use in many applications including laboratory, analytical and research operation, vacuum production, thin films, space simulation chambers, and optical coatings.

SPECIFICATIONS	SANTOVAC 5
Vapor pressure at 25°C	4.10^{-10} mbar
Boiling point at 10^{-2} mbar	200°C
Viscosity at 40°C	307 cSt
Viscosity at 100°C	15.4 cSt
Pour point	4°C
Flash point	288°C
Fire point	349°C
Density	1.20 g/ml
Packaging	100 cc / 500 cc



Santovac 5

Vacuum Greases and Sealants

DOW-CORNING SILICONE HIGH VACUUM GREASE

Silicone High Vacuum Grease is sealant which is ideally suited for all high vacuum applications. The grease is of uniform, soft consistency and can be used over a wide range of temperatures. Important features of

this high vacuum grease include good sealing ability, excellent resistance to water, chemicals, high and low temperatures, and low volatility. This grease can be used in applications operating down to 10^{-8} mbar.

SPECIFICATIONS	DC HIGH VACUUM GREASE
Vapor pressure at 25°C	1.10^{-8} mbar
Color	light grey/translucent
Temperature range	-40 to 200°C
Evaporation after 24h at 200°C	< 2%
Packaging	50 g



High Vacuum Grease

PFPE INERT HIGH VACUUM GREASES

Inert High Vacuum Grease is a combination of an extremely low vapor pressure perfluoroalkylpolyether oil and a fluorocarbon resin thickener. These homogenous, white, buttery greases are designed for use in high vacuum environments operative where exposure to corrosive gases is probable. Inert High Vacuum Grease is not degraded or dissolved by most solvents, acids, bases, or other highly reactive chemicals, and can be cleaned from surfaces by dissolving the oil portion with solvent.

geminYe VAC 3

VAC 3 is particularly suitable for use as a lubricant of mechanical parts operating at high vacuum and in contact with aggressive chemicals or oxygen. Y VAC 3 is used in lubricating "for life" applications; its lubricating properties make it suitable for parts for long periods of time, and at very high operating temperatures (from -20°C to 200°C) and is used in the manufacturing, aeronautical, and electromechanical industries.

RT 15

RT 15 is suitable for lubricating mechanical parts requiring boundary (extreme pressure) lubricating properties. Shell four ball EP test show that RT 15's welding point is 800 kg. Its operation temperature range is from -20°C to 200°C. Its properties make it suitable in lubrication "for life" applications.



Fomblin RT 15

KRYTOX LVP

Krytox LVP high vacuum grease is used as a sealant or lubricant in vacuum systems. Chemically inert and offering superior lubrication properties, Krytox LVP grease combines the extremely low vapor pressure of Krytox fluorinated oil, which is based on the most stable type of perfluoroalkylpolyether available, with a fluorocarbon thickener. Thus, Krytox LVP grease will not explode, ignite, decompose, react to form gummy or solid deposits, or act as fuel for fires. It retains its lubricating ability at temperature extremes ranging from -15 to 300°C and offers complete oxidation resistance. All these features add up to lower wear and longer life for equipment and components -so important when access for component repair or replacement is difficult or impossible.



Krytox

SPECIFICATIONS	UNITS	geminYe Y VAC 3	RT 15	KRYTOX LVP
Vapor pressure at 25°C	mbar	1.10 ⁻⁹	1.10 ⁻⁹	1.10 ⁻¹³
Penetration (worked, 25°C)	mm/10	250	295	265-295
Temperature range	°C	-20/+200	-30/+150	-15/+300
Density	g/ml	1.92	1.92	1.94
Viscosity	cSt	1500 at 20°C	1300 at 20°C	740 at 40°C
Packaging	-	100 g	100 g	100 g

BRAYCOTE VACUUM GREASES

The Braycote line of high vacuum greases has been developed to cover a wide range of temperature and chemical environments. The Braycote greases are perhaps best known for their high chemical inertness which derives from their basically completely fluorinated chemistry, both in terms of the "base liquid", which is very similar to a diffusion pump fluid, and the solids phase, which is a micro-colloid of tiny polytetrafluoroethylene (PTFE) "dispersion" particles.

BRAYCOTE 600 EF

This grease is designed to operate in the presence of fuels, oxidizers, and in applications of deep space vacuum. It is used in gears, ball and roller bearings, electrical contacts, and O-rings. This grease is highly recommended for applications where temperature extremes and/or low vacuums are routine, such as cryogenic coolers, laser optical systems, or hostile chemical environments. Perfluorinated greases, such as Castrol Braycote® 600 EF exhibit excellent shelf life due to their intrinsic inertness.

CASTROL MICROCOTE 096, 196, AND 296

These greases are smooth off-white colored perfluoropolyether greases in NLGI grades 0, 1, and 2 respectively. Each Castrol Microcote product uses a proprietary base fluid thickened with a special polytetrafluoroethylene (PTFE) gelling agent with an average particle size of 0.8 µm. These products are specially formulated to provide

wear protection in most load and speed conditions under high or extreme vacuum conditions. These products offer excellent lubricity, thermal stability, low volatility, good shear stability, low acute toxicity, and contain no Sodium or other alkali metal containing ingredients. These greases are nonflammable and chemically inert.

SPECIFICATIONS	UNITS	BRAYCOTE 600 EF	MICROCOTE 096	MICROCOTE 196	MICROCOTE 296
Vapor pressure at 60°C	mbar	7.10 ⁻¹²		6.10 ⁻¹²	
Vapor pressure at 100°C	mbar	6.10 ⁻¹⁰		3.5.10 ⁻¹⁰	
Vapor pressure at 150°C	mbar	4.10 ⁻⁸		9.4.10 ⁻⁷	
Penetration (worked, 60 stroke at 20°C)	mm/10	288	376	328	272
Temperature range	°C	-80/+200	-50/+204	-50/+204	-50/+204
Oil separation (22 hrs, 204°C)	% wt	11.83*	8.9	11.7	6.4
Low temperature torque at -73°C starting running	N.m	0.14 0.06	0.04 0.02	0.06 0.04	0.14 0.05
Packaging	-	10 g / 57 g	57 g	57 g	57 g

* Oil separation: worked 30 hrs, 204°C

APIEZON GREASES

All stopcocks and moveable joints in a vacuum system must be satisfactorily lubricated while remaining leak proof. The ideal lubricant for this purpose would have a low vapor pressure and be stable, chemically inert, non-toxic, and easily applied/removed. Apiezon greases have these qualities. A wide range of greases are available for various applications.

AP 100 is a high vacuum grease with a softening point at 30°C. A blend of very low vapor pressure hydrocarbons and polytetrafluoroethylene (PTFE) lubricant. PTFE is virtually insoluble in all solvents.

AP 101 is based on a heavy duty lubricating grease gelled with Lithium stearate (a silicone earth), and PTFE, and can be used over a wide range of temperatures (-40°C to 180°C).

APIEZON AP 100 AND AP01 ANTI-SEIZE GREASES

AP 100 and AP 101 are specifically designed to prevent ground glass or polished glass joints in laboratory apparatus from seizing together, particularly in systems containing solvents. For these applications type AP greases have been found to be superior to silicones and petroleum jellies. As a result, AP greases are ideal lubricants for general laboratory use. Packed in tubes for ease of application, AP greases can be removed by wiping with a soft cloth or washing in an aqueous glassware detergent.



Apiezon AP 101

APIEZON H

Apiezon H will withstand temperatures up to 250°C without melting. In fact, it stiffens at temperatures above 40°C. It is of a rubbery nature and intended for lubricating glass taps and general purposes where a high melting point grease must be used.

APIEZON L

Apiezon L is a petrolatum hydrocarbon grease containing no additives. It has excellent vapor pressure capabilities, and is recommended for high vacuum use. It is widely used in gas-liquid chromatography, and may be used on all ground joints in a vacuum system where it is essential to have a grease with good lubricating properties and a low vapor pressure. It melts at 47°C and should not be used where temperatures at joints are likely to be above 30°C.

APIEZON M

Apiezon M is a general purpose grease for use in systems requiring a lubricant of moderate vapor pressure. It is used whenever a good lubricant is required and is recommended for vacuum use and general O-ring use throughout the laboratory. Grease M is not intended for use with joints that may exceed 30°C.



Apiezon M

APIEZON T

Apiezon T can be used over a wider temperature range. It contains a gelling agent which, though not truly soluble in organic solvents, is readily dispersed by them; it is therefore easily cleaned from metal and glass surfaces by solvent action.



Apiezon N

APIEZON N

Apiezon N can contain a high molecular weight polymeric additive that allows it to form a rubbery, cushioning effect between mating surfaces. The physical nature of this product makes it a popular grease for high vacuum use as well as general purpose laboratory use. It is not recommended for use above 30°C. Vapor pressure is estimated to be 8.10^{-10} mbar at 20°C.

When it comes to low temperature applications, nothing comes close in performance to Apiezon N Grease. The product retains most of its important properties all the way down to -269°C/4°K. This lubricant solution to those low temperature challenges can also be cycled from these low temperatures up to room temperature and then back down without showing visible signs of cracking. And in addition, this grease is completely free of any silicones or halogens.

Typical static applications:

- Sensor mount within certain low temperature scientific instruments
- Thermal coupling medium within cryostats
- Use in just about any cryogenic experiments

SPECIFICATIONS	UNITS	AP 100	AP 101	H	L	M	T	N
Vapor pressure at 20°C	mbar	8.10^{-10}	5.10^{-6}	2.10^{-9}	7.10^{-11}	2.10^{-9}	$4.6.10^{-9}$	8.10^{-10}
Melting point	°C	47	> 150	Does not melt	47	44	125	43
Average molecular weight	-	-	-	1000	1300	950	-	1300
Specific gravity at 20°C	g/ml	1.042	0.981	0.918	0.896	0.894	0.912	0.911
Packaging	-	50 g	50 g	25 g	25 g/50 g	25 g/100 g	25 g	25 g

APIEZON WAXES AND SEALING COMPOUNDS



Wax W100

Apiezon waxes are designed for sealing joints of a permanent nature. Three grades of wax are available, all similar, but with differing degrees of hardness and softening points. Wax W is used in most applications, but a softer wax is used where it would simplify application or where there may be vibration problems.

WAX W

Wax W is a general purpose wax with the highest melting point of the three Apiezon waxes. Wax W softens between 80°C and 90°C and is suitable for sealing joints that may become warm during operation. Wax W should be heated to about 100°C for ease of application.

WAX W100

Softer than Wax W, Wax W100 softens between 50 and 60°C. It is used where a wax seal is needed, but there is possibility of a joint cracking due to vibration. Wax 100 should not be used above temperatures of 50°C.

WAX W40

Wax W40, the softest wax, is designed for use where it is required so have the sealing medium flow into or around a joint, but at the same time the temperature of the joint must be kept as low as possible. Occasions for use of such wax arise where the glass of the apparatus may crack if heated. Wax W40 is designed to flow at temperatures of 50-60°C; it cannot be used for apparatus likely to heat above 30°C.

APIEZON Q COMPOUND

Is a putty-like substance used to seal joints and fill holes and gaps on the rotary side of a high vacuum system. It is suitable for sealing the edges of flat, underground joint in test equipment where parts of the system must be blanked off temporarily. A further example is the sealing of glass jars to metal plates to produce temporary vacuum enclosures.

SPECIFICATIONS	UNITS	WAX W	WAX W100	WAX W40	Q COMPOUND
Physical properties					
Approximate softening point	°C	80 to 90	50 to 60	40 to 50	45
Vapour pressure at 20°C	mbar	4.10^{-9}	$4.5.10^{-9}$	6.10^{-8}	1.10^{-4}
Temperature for application	°C	130	110	90	Ambient
Temperature range	°C	-10 to 75	-10 to 45	-10 to 35	-10 to 30
Water permeability at 25°C	$\text{g.cm}^{-1}.\text{hr}^{-1}.\text{mbar}^{-1}$	$1.4.10^{-8}$	$1.6.10^{-8}$	$1.6.10^{-8}$	N/A
Thermal/Electrical properties					
Thermal conductivity	$\text{W.m}^{-1}.\text{°C}^{-1}$	0.189	0.170	0.177	N/A
Specific heat at 25°C	J.g^{-1}	1.8	2.7	2.9	N/A
Volume resistivity	$\Omega.\text{cm}^{-1}$	$6.31.10^{15}$	$1.64.10^{15}$	$5.06.10^{15}$	N/A
Packaging	-	1 kg	250 g	250 g	1 kg

VacSeal High Vacuum Leak Sealant & Cement

Unique silicone based systems for sealing / cementing leaks in high and ultra-high vacuum systems

VACSEAL

VacSeal is a silicone based liquid resin system developed primarily for sealing leaks in high and UHV systems. It was recently reformulated to contain no Class 1 ozone depleting chemicals. VacSeal will seal leaks as large as 4.10^{-6} l/s on systems under evacuation. The sealant will repair larger leaks if the system is at atmospheric pressure. Weight loss and vapor pressure characteristics are truly outstanding.

VacSeal is extremely useful as a cement for sealing all kinds of optical windows and CRT glass to wire feedthroughs. It will substantially reduce the IR reflectivity of metals and will produce higher emissivity levels for better heat transfer. The product can be used for the sealing of Brewster windows for lasers. And it can be used for more mundane applications such as the repairing of gauge tubes and also vacuum feedthroughs. VacSeal, when sprayed on a surface, "dries" to a film that is optically transparent and exhibiting optical properties generally characteristic of clear silicone polymers.

The use of this product almost always results in reduced downtime, in some cases eliminates the need for expensive "permanent" repairs, and on occasion has been known to save an experiment in progress. VacSeal has major potential for application as an adhesive at cryogenic temperatures as well as good radiation resistance. The sealant's durability will survive the environment of space without adverse effect on the product or the spacecraft itself. For vacuum systems, just about where there is any kind of a joint is a potential application for VacSeal.



VacSeal leak sealant

VacSeal can withstand repeated temperature cycling from liquid helium temperatures to 450°C over long intervals of time.

PACKAGING

- Aerosol: 450 g, with 152 mm snorkel tube
- Bottle: 15 g, with brush

NYE Greases for Severe Applications

For more than 50 years, NYE has been working with NASA and leaders in the commercial aerospace industry, qualifying lubricants for mission critical components while addressing problems like outgassing, contamination, and starvation. Outgassing reduces the effectiveness of a lubricant and can contaminate nearby components.

Neyco offers a complete line of NYE lubricants for Vacuum, Semiconductor and Cleanroom Solutions.

UNIFLOR 8322

Uniflor 8322 is a PTFE thickened, heavy viscosity, completely fluorinated grease intended for applications where plastic and elastomer compatibility and resistance to aggressive chemicals are required.

SPECIFICATIONS	UNITS	UNIFLOR 8322
Vapor pressure at 20°C	mbar	7.10 ⁻¹²
Vapor pressure at 100°C	mbar	6.10 ⁻¹⁰
Temperature range	°C	-20 to 250
Density	g/ml	1.97
Base oil viscosity index	-	138
Base oil viscosity at 40°C	cSt	800



Uniflor 8322



NyeTorr lubricants

NYETORR

These products have been developed with several key parameters in mind: Low Outgassing, High temperature Stability, Aggressive Chemical Resistance, Wear Protection, and Cleanliness. The raw materials used in NyeTorr formulations are tightly controlled on a molecular level to limit the vapor pressure, outgassing and contamination.

Nye tests and certifies the vapor pressure of each batch to guarantee that the vapor pressure on the label matches the actual vapor pressure of the lubricant. Additionally, all NyeTorr lubricants are subjected to a proprietary "Ultrafiltration Process" which removes microscopic particulates and homogenizes agglomerated thickeners.

NyeTorr offers all known fluorinated lubricants as well as non-fluorinated oils and greases, which are better suited to more heavily loaded devices. Importantly, non-fluorinated products have vapor pressures as low as fluorinated products.

NyeTorr comes with custom formulation services. If a standard NyeTorr lubricant does not optimize the performance of your device, Nye engineers will work with you to customize a vacuum lubricant that meets your needs.

COMPARATIVE MATRIX OF NYE PRODUCT LINES FOR THE SEMICONDUCTOR INDUSTRY

	ULTRAFILTERED (< 300 PARTICLES/cc < 35 µm) LOW PARTICLE GENERATION (CLASS 1.00 CLEANROOM CAPABLE)	HIGH TEMPERATURE (CAPABLE OF > 175°C)	WEAR RESISTANCE	CHEMICALLY INERT	VERY LOW STARTING TORQUE (< 200 .g.cm) LOW OUTGASSING (PASSING ASTM E-595 RESULT)	LOW VAPOR PRESSURE	VACUUM CAPABILITIES
NyeTorr 6200	•	•	•	•	•	•	XXXXX
NyeTorr 6300	•	•	•	•	•	•	XXXXX
NyeTorr 5200	•	•	•	•	•	•	XXXX
NyeTorr 5300	•	•	•	•	•	•	XXXX
NyeTorr 5350	•	•	•	•	•	•	XXXX
NyeTorr 5370	•	•	•	•	•	•	XXXX
NyeTorr 5380	•	•	•	•	•	•	XXXX

SPECIFICATIONS

	TEMPERATURE RANGE (°C)	BASE OIL CHEMISTRY	BASE OIL VISCOSITY ASTM D-445 (cSt)		EVAPORATION (24 HRS, 100°C) (%)	VAPOR PRESSURE KNUDSEN (25°C) (mbar)	DENSITY (g/cc)	MICROSCOPIC PARTICULATE CONTAMINATION
			100°C	40°C				
NyeTorr 6200	-45 to 150	MAC*	14	106	0.00	4.7.10 ⁻¹²	1.05	< 300 particles/cc < 35 µm
NyeTorr 6300	-75 to 250	PFPE**	56	187	0.00	4.5.10 ⁻¹²	1.89	< 300 particles/cc, < 35 µm
NyeTorr 5200	-45 to 150	MAC	15	108	0.00	4.10 ⁻¹²	1.05	< 300 particles/cc < 35 µm
NyeTorr 5300	-65 to 250	PFPE	45	140	0.02	6.10 ⁻¹¹	1.91	< 300 particles/cc < 35 µm
NyeTorr 5300XP	-65 to 200	PFPE	45	140	0.11	6.10 ⁻¹¹	1.85	< 300 particles/cc < 35 µm
NyeTorr 5350	-55 to 250	PFPE	28	152	0.00	1.6.10 ⁻¹⁰	1.91	< 250 particles/cc < 35 µm
NyeTorr 5370	-70 to 250	PFPE	86	310	0.02	3.8.10 ⁻¹⁰	1.89	< 50 particles/cc < 35 µm
NyeTorr 5380	-10 to 250	PFPE	58	800	0.00	3.10 ⁻¹⁴ (20°C)	1.91	< 100 particles/cc < 35 µm

*MAC : Multiylated Cyclopentanes

**PFPE : PerFluoroPolyEthers

NYECLEAN 5077

The NyeClean 5077 has been developed with its focus on a wide range of general purpose applications in lower vacuum cleanroom environments. With this product, you will find a lubricant developed for motion control applications like bearings, linear guides, and ball screws. Some of the benefits of the NyeClean product line include low particle generation, wear prevention and low torque.



NyeClean 5077

	TEMPERATURE RANGE (°C)	BASE OIL CHEMISTRY	BASE OIL VISCOSITY ASTM D-445 (cSt)		EVAPORATION (24 HRS, 100°C) (%)	VAPOR PRESSURE KNUDSEN (25°C) (mbar)	DENSITY (g/cc)	MICROSCOPIC PARTICULATE CONTAMINATION
			100°C	40°C				
NyeClean 5077	-55 to 250	PFPE	28	152	0.02	1.6.10 ⁻¹⁰	1.90	N/A

Perfluorosolv PFS-1 / PFS-2 Cleaning Solvents

Perfluorosolv Solvent are a low molecular weight perfluoropolyether which can be used in many industrial applications. They perform well in many electronic and semiconductor cleaning applications, such as:

- Pump and compressor cleaning
- Vapor blanketing
- Degreasing
- Flash point reduction
- Dewatering
- Trace residue elimination

PFS-1

PFS-1 solvent has been formulated to be compatible and completely miscible with perfluoropolyether (PFPE) and perfluorocarbon fluids at all temperatures and chlorotrifluoroethylene (CTFE) oils and greases above 45°C. PFS-1 solvent can also act as a diluent in the application of more viscous PFPE fluids or greases.

PFS-1 solvent is non-flammable and well suited for cleaning operations where:

- Solvents are applied to hot components
- Solvents are heated prior to application
- Solvents are pressure sprayed on components
- Solvents are used in forced air stream cleaning
- Extended immersion baths are required

PFS-2

PFS-2 has lower boiling point and hence a higher evaporation rate compared to PFS-1. Parts cleaned with PFS-2 will dry faster than those cleaned with PFS-1. When using PFS-2, especially in open baths, it may be necessary to take precautions to avoid excessive losses from the bath.

SPECIFICATIONS	PFS-1	PFS-2
ODP (Ozone Depletion Potential)	Zero	Zero
Boiling point	90°C	57°C
Density at 25°C	1.69 g/ml	1.65 g/ml
Viscosity at 25°C	0.75 cSt	0.45 cSt
Vapor pressure at 25°C	100 mbar	300 mbar
Flash point	None	None
Surface tension at 25°C	14 dyne/cm	10 dyne/cm
Heat of vaporization at boiling point	17 cal/g	22 cal/g
Packaging	1 kg / 5 kg	1 kg / 5 kg

TYPICAL APPLICATIONS

PFPE and CTFE fluids are used extensively in semiconductor and electronic manufacturing for vacuum pump lubrication and in chip etching processes. Here, product integrity literally depends upon maintaining ultra-clean environments, so thorough cleaning are mandatory. PFS-1 has proven to be highly efficient in the elimination of contaminate build-ups and organic cleaner residues. PFS-1 is also used in vacuum pump and compressor components during flushing & rebuilding operations.



VACUUM MANUFACTURING & QUALITY

-
- Manufacturing & Quality 0 03
 - Conversion Tables..... 0 07



Neyco's Headquarters in Paris



Our manufacture in England

Manufacturing & Quality

Manufacturing and offering technical support in vacuum and inorganic materials require a strong scientific background and a strong organization.

To ensure the best answers to your needs as well as a consistency over years, Neyco uses the ISO 9001 Quality Management System.

ISO 9001 and ISO 14001 Management Systems enable Neyco to trace all new materials, to active all certificates of analysis, to ensure that all deliveries match with specific needs within the strict respect of our environment.

MANUFACTURING

NEYCO uses computer numerically controlled (CNC) equipments for flange, common parts and repeatable drawings for an optimized control of dimensions as well as costs.

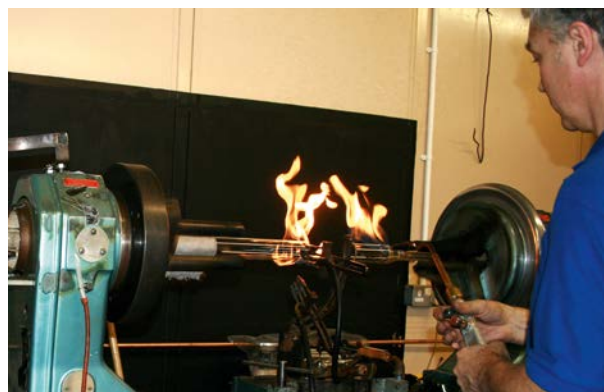
- KF, ISO, CF Stainless Steel components (304L, 316L, 316LN).
- UHV bellows (316, 316L).
- UHV and HV chambers in Stainless Steel and Aluminum.
- Glass / metal feedthroughs and components.
- Ceramic / metal feedthroughs.
- Chain clamps (various materials).
- Teflon vacuum components.
- Light polymer KF components.
- Vacuum valves.
- Vacuum measurement.

All our vacuum welds are Tungsten Inert Gas (TIG) fusion welds for tight metal bonds.

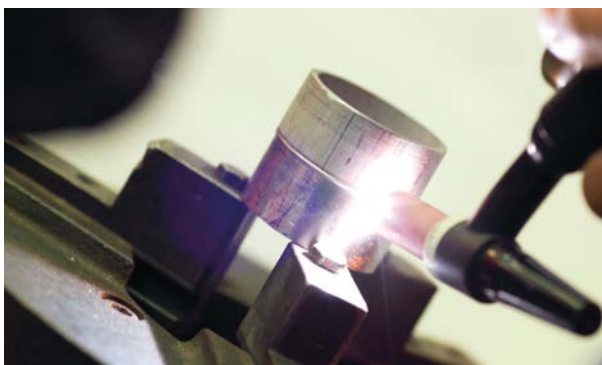
All welded components are Helium mass-spectrometer leak checked as standard procedure.



Stainless Steel chamber manufacturing



Glass component manufacturing



TIG welding



He leak test



CF flanges after cleaning



CLEANING

NEYCO pays close attention to cleaning. Our UHV cleaning procedure is continuously applied and integrated in handling and packaging practices ensuring that all parts are ready for ultra-high vacuum service when they reach end user.

BAKE-OUT OPTION

All parts, components, chambers can be delivered after bake-out (up to 380°C) under secondary vacuum. This ensures the lowest outgassing for UHV direct integration. In situ residual gas analyser (RGA) monitors the ultimate vacuum while desorption.



CONTROL CERTIFICATES

- **Inspection certificate**
On request our manufactured parts can be dispatched along with inspection certificate within EN 10204 standard (type 3.1) which confirms the batch number of the starting material as well as mechanical properties.
- **Dimension report certificate**
On request our manufactured parts can be dispatched along with dimensions report certificate which confirms dimensions on a list of user's selected values.



- **Helium leak test certificate**
On request our manufactured parts can be dispatched along with He leak test certificate which measures the leak rate of the given part within the detection limit of 1.10^{-10} mbar.l.s⁻¹

STOCK AND DELIVERY SERVICE

Extensive stock holdings, efficient computerised stock control and a well organised packing and despatch department, all contribute to the company's reputation for fast efficient service.



TRACEABILITY

Each single order (without any minimum amount) has its own internal file number related to both a paper file and a SAP file. Requested dimensions, common part numbers or customer's drawing are noted on this file as well as specific requirements. One can always refer to a previous order (within five years) and we shall then have all the necessary information to reproduce the manufacturing process or even improve when possible.

STANDARDS

Neyco started in 1988 the Assurance Quality process in order to settle firm bases of quality, for our own working way as well as for customer. We started with the ISO 9002 Certification, then obtained the ISO 9001 Certification in 2001 and we recently improved with the ISO 14001 Certification. All our certifications are given by AFNOR-AFAQ as a well-known certification organization. We maintained over the years the Quality meetings on a monthly basis, and all non-conformities, modifications, quality improvements, new ideas... are discussed during these meetings, meaning that everyone is correctly informed and trained for customer's satisfaction as well as personal development which should go together.



ISO 9001:2008 certificate

REACH COMPLIANCE

REACH (Registration, Evaluation and Authorisation of Chemicals), the most significant change in the European Union's (EU) chemical management history, started in June 2007. REACH is a EU regulation, which applies to all materials circulating in European Union becoming by the law global compliance matter.

REACH aims to **better protect human health and the environment** as well as enhance the competitiveness of the chemical industry by fostering innovation.

Neyco has pre-registered substances in its current portfolio for which it has responsibilities and obligations to match REACH requirements. Neyco is working with raw material suppliers and downstream customers to ensure compliance. Once the initial pre-registration period ends, we will work towards registration according to the REACH implementation timeline.



ISO 14001:2004 certificate

The CLP Regulation (Regulation (EC) No 1272/2008) is the new European Regulation on Classification, Labelling and Packaging of chemical substances and mixtures. The legislation introduces, throughout the EU, a new system for classifying and labelling chemicals, based on the United Nations' Globally Harmonised System (UN GHS). Correct and unambiguous substance identification is essential for Neyco:

- Each hazardous chemical product is delivered with a MSDS (Material Safety Data Sheet).
- Each container of hazardous chemical product is labelled as specified in the CLP Regulation.

ETHICAL CHART

We, at Neyco, consider that there is no business without human values and we are committed to :

- Full respect of diversity for our employees.
- True respect of our environment by continuous tracing of our various consumptions.
- Individual development and a good balance between work and personal life.
- Human management to avoid internal stress and hard feelings.
- Strict prohibition of false promises and twisted truths.
- Yearly budget for solidarity near-by ("Abbé Pierre", "Restaurants du Coeur").
- Yearly budget for worldwide solidarity ("Salvation Army", "Red Cross").
- Long term relationship inside Neyco as well as with our partners.



**Trying to manufacture and offer
the best products for the best technical
applications to the best customers**



neyco

84 rue de Levis
75017 PARIS - France
Tel: +33(0)1 40 53 07 53
Fax: +33(0)1 40 53 07 52

www.neyco.fr



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