Vacuum Viewports

Contents

Introduction

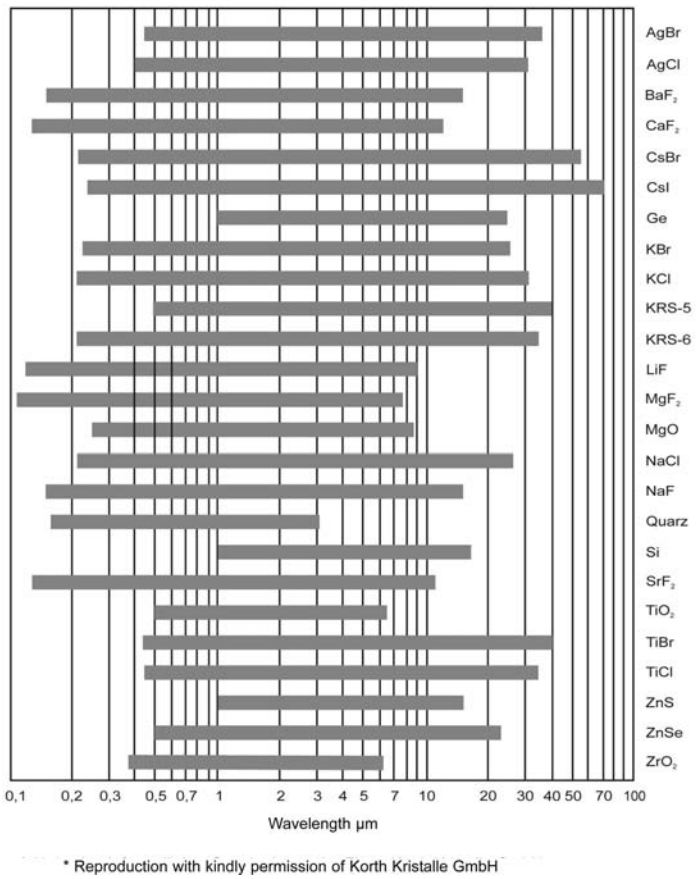
It is often necessary to observe the processes within the vacuum line visually. Different characteristics are required from a viewport depending on the individual processes ranging from simple visual inspection of positioning up to highly precise measurements by laser beams. The following aspects need to be considered in order to select the right viewport:

1. The correct material has to be selected for the viewport depending on the wavelengths it is exposed to.
2. The optical quality of the viewport needs to be specified in order to satisfy the optical requirements. This includes the surface quality itself, such as scratch and dig , its flatness and parallelism of the optical planes towards each other, as well as the treatment of the surface with optical coatings (e. g. anti-reflection coatings with various transmission properties).
3. Your process defines the pressure range that have a great impact on the connection method between the optical material and the flange.
4. Furthermore it is important to consider other ambient conditions the viewport is exposed to, e. g. radiation level of the most different wavelengths, contact with aggressive gases or media, the temperature range of the application, or the interaction with magnetic fields. These parameters have a great impact on the lifetime and performance of the viewport. We would be pleased to give advice regarding these points.

The requirements are versatile and still increasing with further applications. There are time-tested solutions, others have been developed in our company - partly in cooperation with partners - and listed in this catalogue. And we will keep on searching for new solutions, if your needs go beyond. Our experienced team of optical specialists, material scientists and vacuum technologists always looks forward to new challenges.
Besides the optical applications of viewports, it may be also necessary to provide dielectric materials with a conducting transparent layer in order to avoid charging effects. Please find solutions (ITO layers) for this aspect on page 3-7.

If a viewport is going to be used in the high energetic range it may be necessary - due to protection of labour (x-ray absorption) - to provide viewports with an extra lead glass cover. Information about high-resolution RHEED windows which are used for instance in the MBE technology, are also shown on page 3-7.

Transmission Ranges*



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Viewport Material

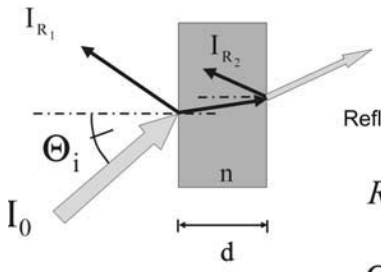
The following table shows the window materials offered by VACOM with transmission ranges, application areas as well as brandnames if applicable:

Material (brand names)	Applications	Optical transmission range* (µm)	Max. temperature** (°C)
Borosilicate (Borofloat®, BK7®)	Neutron poisons, substrates for dielectrical coatings, photovoltaics, water substrates	0.2 – 2.5	350
Quartz, crystalline SiO_2 / fused silica (Spectrosil® 2000)	VUV filters, polarisation optics, excimer laser as well as other critical applications in VUV, FIR screens	0.19 - 4	> 1200
Magnesium fluoride MgF_2	VUV optics, excimer laser, polarisation optics	0.12 - 7	200
Calcium fluoride CaF_2	Different qualities for IR, UV, VUV laser (best transmission in UV), IR analytics, astro optics	0.13 - 10	200
Barium fluoride BaF_2	Astro optics, correctors in lens systems, scintillator materials	0.15 – 12.5	200
Lithium fluoride LiF	X-ray monochromator crystals	0.12 - 6	200
Sapphire Al_2O_3	Spectroscopy, vacuum viewports, (birefringent : IR and UV transmission)	0.17 – 5.5	350
Zinc sulfide ZnS (Cleartran®)	IR spectroscopy	0.37 – 13.5	200
Zinc selenide ZnSe	CO_2 laser optics, cutting lenses	0.6 - 21	200
Silicon Si	Lenses, band-pass filters, thermography, ATR crystal	1.2 - 15	120
Germanium Ge	Windows, lenses, band-pass filter, thermography, FIR optics, ATR crystal	1.8 - 23	120
Beryllium Be	X-ray tube (permeability of x-rays)	-	350

* Current max. possible clearview.
** Note temperature gradients!

Optical Properties

The quality of a viewport is always determined by the fact how unaltered a beam of a certain wavelength passes the optical medium. Alterations can be caused by optical losses (absorption, reflection or scattering) and aberrations (refractive index inhomogeneities, cords, curvatures and corrugations of the surface, aberrations of the parallelism of the interfaces).
Optical losses are mostly determined by the refractive index and the absorption coefficient. The transmission - that also depends on the thickness of the material and the wavelength - can be specified with the help of these parameters for the first approximation (the following is valid only in case of perpendicular incident light):



$$I_{R1} = R_1 \cdot I_0$$

Reflexion at two interfaces:

$$R_1 = R_2 = R = \left(\frac{n-1}{n+1}\right)^2$$

$$\Theta_i = 0^0$$

Absorption in the medium:

$$\propto \exp(-\alpha d)$$

$$T = \frac{I_t}{I_0} = (1-R)^2 \cdot e^{-\alpha d}$$

Viewport Material - Surface Antireflection Coating

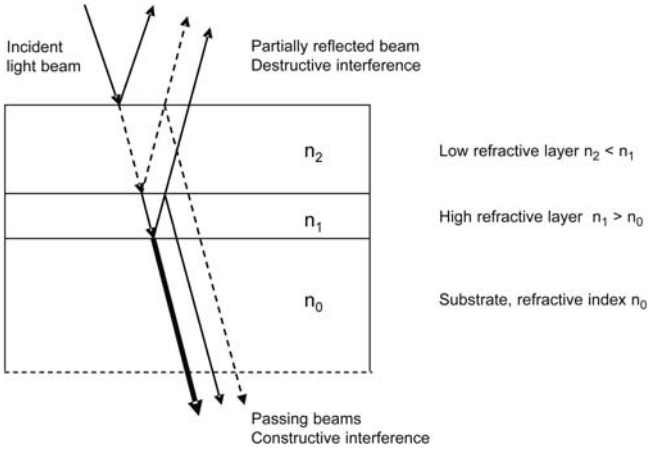
The following table shows the reflection and transmission rates of selected materials (absorption at perpendicular incident light neglected):

Material	Index of refraction n (at 500 nm, * at 3 µm)	Reflection loss R %	Transmission T %
Magnesium fluoride MgF_2	1.38	2.55	94.97
Lithium fluoride LiF	1.39	2.66	94.75
Calcium fluoride CaF_2	1.44	3.21	93.68
Quartz SiO_2 (synthetic)	1.46	3.50	93.13
Borofloat	1.47	3.62	92.89
Barium fluoride BaF_2	1.48	3.75	92.65
Borosilicate BK7	1.52	4.26	91.67
Zinc sulphide ZnS	2.42*	17.24	68.49
Zinc selenide ZnSe	2.43*	17.38	68.26
Silicon Si	3.43*	30.09	48.88

Another important source of optical loss is light scattering. Optical inhomogeneities within the material (air bubbles, grid dislocations) in the range of 1 … 10 µm function as stray centres. In addition to that stray losses are caused by rough surfaces (polishing, scratches) and accumulations on surfaces (dust particles, water vapour, cleaning residues).

Even if an optical material is produced without causing aberrations, these can arise also when the material is fixed into the flange, because of thermal strains or mechanical tensions. If you have high requirements regarding the prevention of aberrations, please specify the necessary quality in your request for quotation..

Antireflection coating of Viewports
We are able to avoid reflections at the surface increase the transmission rate, using aspects of interference.
The basic principle is shown in the following illustration:

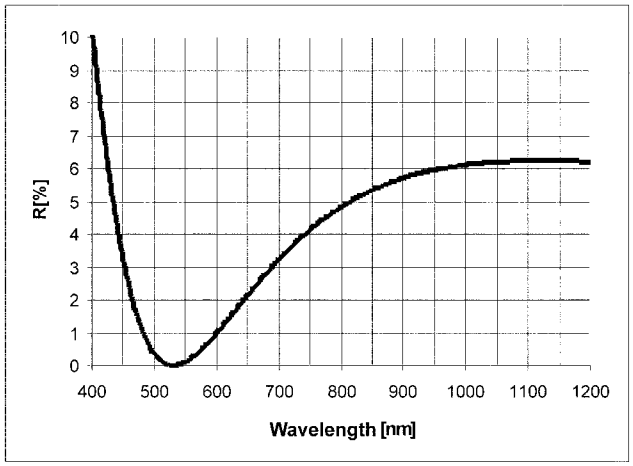


Viewport Material - Antireflection Coating

Antireflection coatings can be produced as narrow or broad band coatings for the most different applications. Coatings for standard applications are specified in this catalogue: 1QWOT (single layer), Multi Layer broad band and and `V´ coatings. Furthermore we can elaborate and manufacture special solutions for you in cooperation with experienced coating companies.

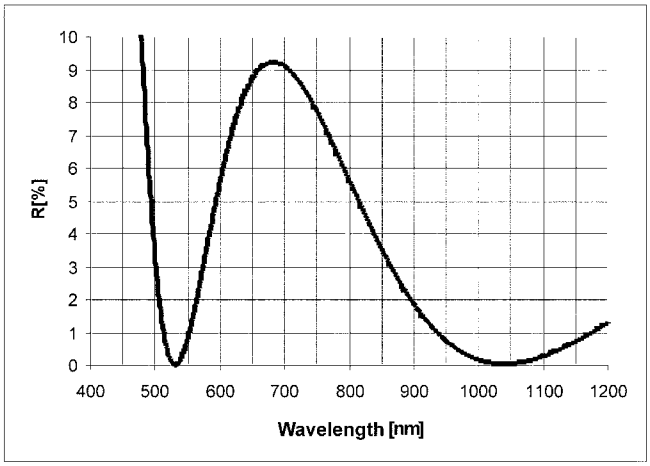
Examples of different types of antireflection systems with which approximation to zero reflection (depending on technical complexity) can be achieved are shown below. Software is available to model antireflection coatings to customer requirements. We would be pleased to advise you in finding the optimum for your individual application.

Single wavelength antireflection coating



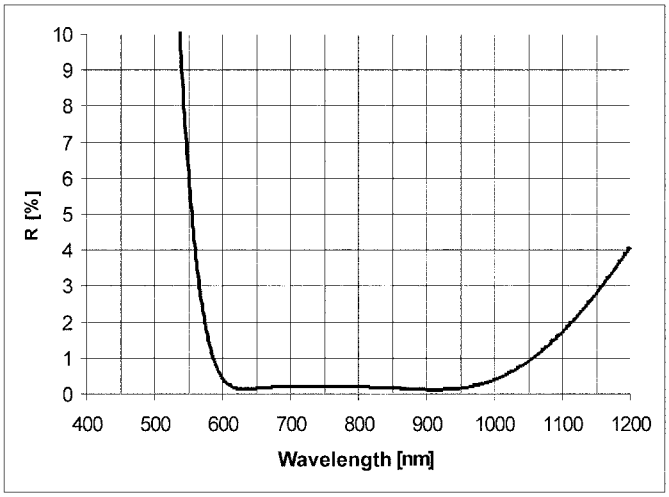
Residual reflection R < 0.5 % per side

Double wavelength antireflection coating



R < 1 % per side

Broad band antireflection coating



R < 1 % per side

Vacuum compatible combinations between optical and flange materials

The main problem in the manufacture of viewports is the fact that the thermal expansion coefficients of optical and flange materials are not only very different but the temperature dependence proceeds completely in an other way. As a consequence of that, even little temperature changes can cause mechanical tension that can lead to vacuum leaks and in extreme cases damage the optic. The use of various connecting or adjustment materials between the stainless steel flange and optic material, for the different coefficients of expansion enabled to find solutions for special applications. Costs and efforts for these solutions are quite different as well. We are able to offer the right solution for your individual needs, starting with exchangeable viewports using o-rings through non-exchangeable viewports (glass solder, diffusion bonding, mechanical and brazed connections) up to differentially pumped viewports.

Viewports - Special Coatings

ITO coated glass

Indium tin oxide (ITO) is a transparent and semiconducting material. It is frequently used to apply a conducting and light-transmissive coating to glass or synthetic material. This coating is necessary e. g. to avoid electrostatic charging.

Our viewports, which are made of high quality borosilicate glass, are coated with a thin layer of ITO during a sputtering process. We offer ITO coatings with a surface resistance of 10 Ω/square which reach a transmission of ~ 80 % as standard.

RHEED screens

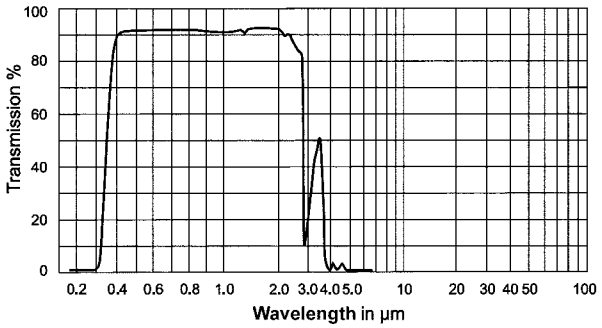
RHEED is the abbreviation for High Energy Electron Diffraction. This procedure uses electron diffraction for the analysis and inspection of surface structures at the atomic level e. g. in molecular beam epitaxy (MBE). The electrons reflected from the surface have a characteristic arrangement and show a typical diffraction pattern. It is possible to make this pattern visible by capturing the reflected electrons on a RHEED screen covered with a phosphor layer.

A standard viewport with a RHEED screen consists of an ITO covered CF viewport with a subsequently added phosphor layer. A version with an additional lead glass covering is available for applications with damaging x-rays.

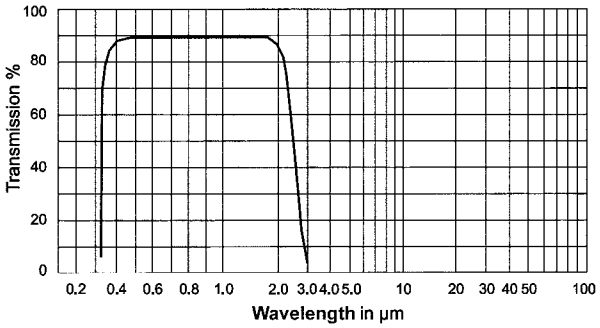
We offer RHEED screens suited for various applications. The thickness and type of the phosphor layer depends on the respective application. We offer four standard phosphor types: P20, P22, P11 and P43. Other phosphor types can be provided on request.

Transmission curves (principle curves)

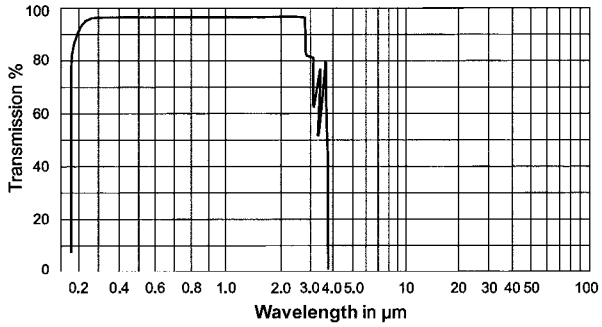
Borofloat®



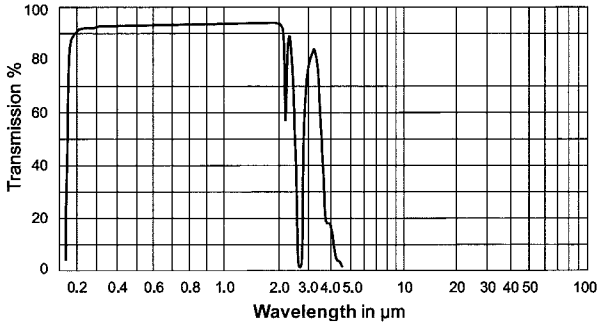
BK7®



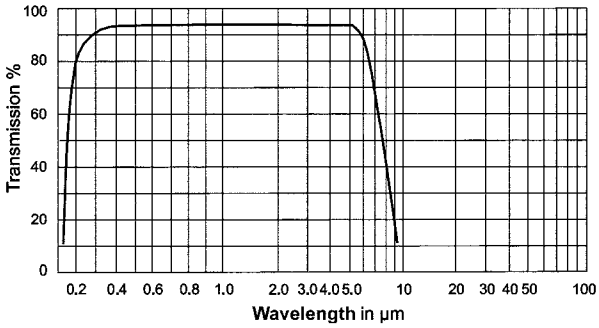
Quartz



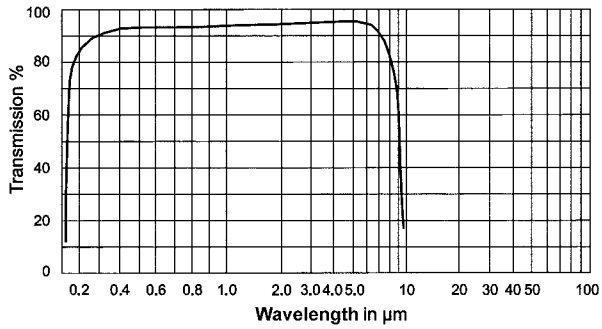
Spectrosil® 2000



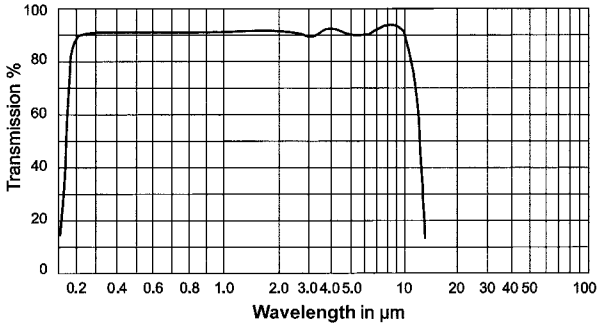
Magnesium fluoride



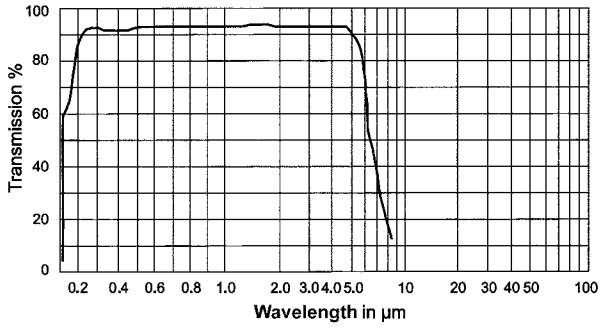
Calcium fluoride



Barium fluoride

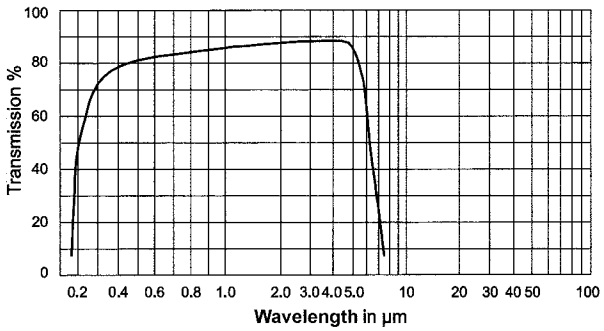


Lithium fluoride

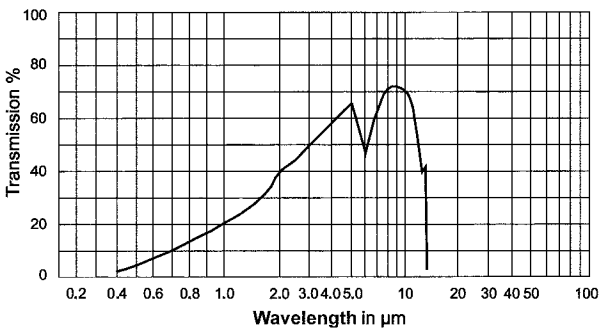


Transmission curves (principle curves)

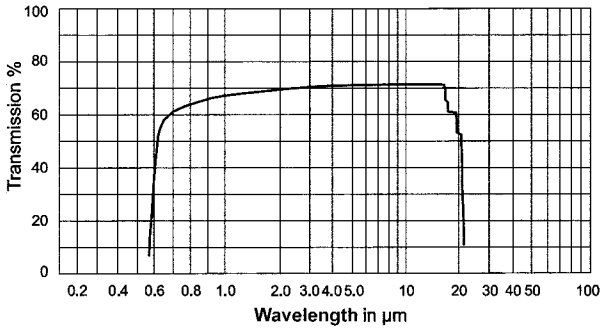
Sapphire



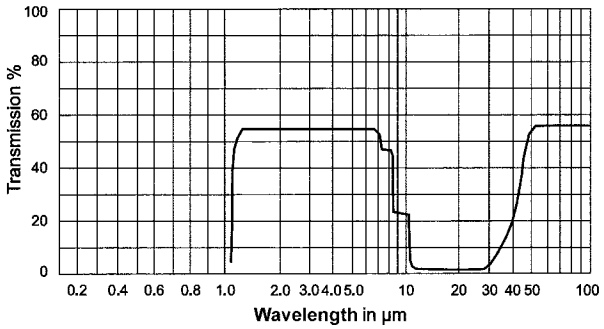
Zinc sulfide



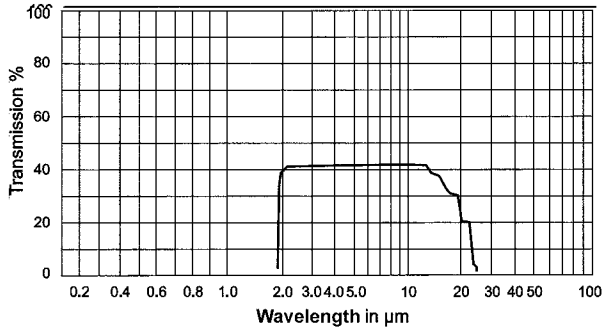
Zinc selenide



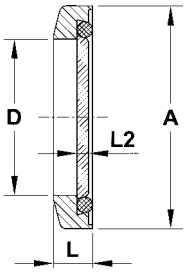
Silicon



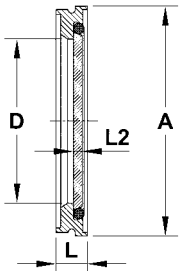
Germanium



Borosilicate, exchangeable windows



KF flange



ISO flange

Technical Data

■ Specifications	KF and ISO-K viewport with exchangeable borosilicate windows - flat construction - easy assembly and disassembly
■ Connection	KF and ISO-K flange
■ Leakage rate	< 1.0E-8 mbar l/s
■ Material window	borosilicate (Borofloat)
■ Material flange	stainless steel
■ Seal	FPM o-ring
■ Transmission range	0.2 - 2.0 µm
■ Min. transmission (without coating)	80 %
■ Temperature range	to 150 °C bakeable
■ Coatings	for detailed information see introduction
• narrow band	350 and 1064 nm
• broadband (ARVIS)	400 - 700 nm
• broadband (ARNIR)	700 - 1110 nm
■ Options	other wavelengths on request

Standard

Order code	Flange	A	D	L	L2
KVPZ40TCRSV	DN40KF	57	40	10.0	3.8
KVPZ50TCRSV	DN50KF	77	50	10.0	3.8
ISOVPZ63TCRSV	DN63ISO	98	70	13.5	3.8
ISOVPZ100TCRSV	DN100ISO	133	102	13.0	5
ISOVPZ160TCRSV	DN160ISO	183	153	17.0	9

With antireflection coating

Order code		Flange	A	D	L	L2
Narrow band	Broadband					
KVPZ40SV-AR350	**KVPZ40SV-ARVIS**	DN40KF	57	40	10.0	3.8
KVPZ40SV-AR1064	**KVPZ40SV-ARNIR**	DN40KF	57	40	10.0	3.8
KVPZ50SV-AR350	**KVPZ50SV-ARVIS**	DN50KF	77	50	10.0	3.8
KVPZ50SV-AR1064	**KVPZ50SV-ARNIR**	DN50KF	77	50	10.0	3.8
ISOVPZ63SV-AR350	**ISOVPZ63SV-ARVIS**	DN63ISO	98	70	13.5	3.8
ISOVPZ63SV-AR1064	**ISOVPZ63SV-ARNIR**	DN63ISO	98	70	13.5	3.8
ISOVPZ100SV-AR350	**ISOVPZ100SV-ARVIS**	DN100ISO	133	102	13.0	5
ISOVPZ100SV-AR1064	**ISOVPZ100SV-ARNIR**	DN100ISO	133	102	13.0	5
ISOVPZ160SV-AR350	**ISOVPZ160SV-ARVIS**	DN160ISO	183	153	17.0	9
ISOVPZ160SV-AR1064	**ISOVPZ160SV-ARNIR**	DN160ISO	183	153	17.0	9

Borosilicate, exchangeable windows

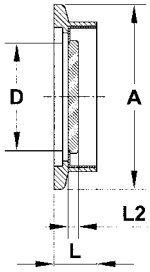
Accessories, replacement windows

Order code	Flange	Accessories for
KF40VPBORO	DN40KF	KVPZ40TCRSV
KF40VPBORO-AR-350	DN40KF	KVPZ40SV-AR350
KF40VPBORO-AR-1064	DN40KF	KVPZ40SV-AR1064
KF40VPBORO-AR-VIS	DN40KF	KVPZ40SV-ARVIS
KF40VPBORO-AR-NIR	DN40KF	KVPZ40SV-ARNIR
KF50VPBORO	DN50KF	KVPZ50TCRSV
KF50VPBORO-AR-350	DN50KF	KVPZ50SV-AR350
KF50VPBORO-AR-1064	DN50KF	KVPZ50SV-AR1064
KF50VPBORO-AR-VIS	DN50KF	KVPZ50SV-ARVIS
KF50VPBORO-AR-NIR	DN50KF	KVPZ50SV-ARNIR
ISO63VPBORO	DN63ISO	ISOVPZ63TCRSV
ISO63VPBORO-AR-350	DN63ISO	ISOVPZ63SV-AR350
ISO63VPBORO-AR-1064	DN63ISO	ISOVPZ63SV-AR1064
ISO63VPBORO-AR-VIS	DN63ISO	ISOVPZ63SV-ARVIS
ISO63VPBORO-AR-NIR	DN63ISO	ISOVPZ63SV-ARVIS
ISO100VPBORO	DN100ISO	ISOVPZ100TCRSV
ISO100VPBORO-AR-350	DN100ISO	ISOVPZ100SV-AR350
ISO100VPBORO-AR-1064	DN100ISO	ISOVPZ100SV-AR1064
ISO100VPBORO-AR-VIS	DN100ISO	ISOVPZ100SV-ARVIS
ISO100VPBORO-AR-NIR	DN100ISO	ISOVPZ100SV-ARNIR
ISO160VPBORO	DN160ISO	ISOVPZ160TCRSV
ISO160VPBORO-AR-350	DN160ISO	ISOVPZ160SV-AR350
ISO160VPBORO-AR-1064	DN160ISO	ISOVPZ160SV-AR1064
ISO160VPBORO-AR-VIS	DN160ISO	ISOVPZ160SV-ARVIS
ISO160VPBORO-AR-NIR	DN160ISO	ISOVPZ160SV-ARNIR

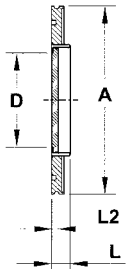
Accessories, replacement o-rings

Order code	Flange
KF40VR-VP	DN40KF
KF50VR-VP	DN50KF
ISO63VR-VP	DN63ISO
ISO100VR-VP	DN100ISO
ISO160VR-VP	DN160ISO

Borosilicate, unexchangeable windows on KF, ISO flange



KF flange



ISO flange

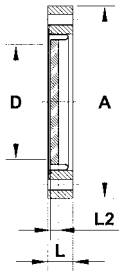
Technical Data

Specifications	KF and ISO-K viewport with firmly connected borosilicate windows
Connection	KF and ISO-K flange
Leakage rate	< 1.0E-10 mbar l / s
Material window	borosilicate
Material flange	stainless steel - 304L (1.4307)
Material seal	glass-to-metal connection (Kovar®)
Transmission range	0.3 - 2.5 µm
Min. transmission (without coating)	80 %
Temperature range	to 200 °C bakeable

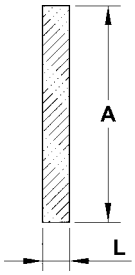
Standard, on KF and ISO flange

Order code	Flange	A	D	L	L2
KVPZ16-V16	DN16KF	30	16	12.7	1.6
KVPZ25-V16	DN25KF	40	16	12.7	1.6
KVPZ40-V32	DN40KF	55	32	12.7	3
KVPZ50-V32	DN50KF	75	32	12.7	3
ISO63VPZ	DN63ISO	95	49	14.0	3.5
ISO100VPZ	DN100ISO	130	65	15.5	3.5
ISO160VPZ	DN160ISO	180	90	18.0	6
ISO200VPZ	DN200ISO	240	135	18.0	8
ISO250VPZ	DN250ISO	290	135	18.0	8

Borosilicate, unexchangeable windows on CF flange



CF flange



ISO flange

accessories, lead glass screen

Technical Data

Specifications	CF viewport with firmly connected borosilicate windows
Connection	CF flange
Leakage rate	< 1.0E-10 mbar l / s
Material window	borosilicate
Material flange	stainless steel - 304L (1.4307)
Seal	various connections possible
Transmission range	0.3 - 2.5 µm
Min. transmission (without coating)	80 %
Temperature range	depends on connection method and material
Coatings • narrow band (1 QWOT) • narrow band (V coated) • broadband	for detailed information see introduction possible coating range 194 - 1200 nm
Options	Please add the required wavelength or wavelength range to the order code.
Connection method	The "XX" in the order code stands for the connection method. Please contact your customer consultant to define the appropriate connection for your application.

Standard, on CF flange

Order code	Flange	A	D	L	L2
VPZ16	DN16CF	34	16	12.7	1.5
VPZ38	DN35CF	70	38	12.7	3
VPZ38LA	DN35CF	70	40	12.7	3
VPZ64	DN63CF	114	63	17.4	3.5
VPZ100	DN100CF	152	90	19.9	6
VPZ150	DN150CF	203	136	22.3	8

With antireflection coating, 1QWOT

Order code	Flange	A	D	L	L2
VPZ16-XX-AR	DN16CF	34	16	12.7	1
VPZ38-XX-AR	DN35CF	70	32	12.7	2.5
VPZ38LA-XX-AR	DN35CF	70	40	12.7	3
VPZ64-XX-AR	DN63CF	114	63	17.4	3
VPZ100-XX-AR	DN100CF	152	89	19.9	4
VPZ150-XX-AR	DN150CF	203	136	22.3	6.5

Borosilicate, unexchangeable windows on CF flange

With antireflection coating, V coated

Order code	Flange	A	D	L	L2
VPZ16-XX-VAR	DN16CF	34	16	12.7	1
VPZ38-XX-VAR	DN35CF	70	32	12.7	2.5
VPZ38LA-XX-VAR	DN35CF	70	40	12.7	3
VPZ64-XX-VAR	DN63CF	114	63	17.4	3
VPZ100-XX-VAR	DN100CF	152	89	19.9	4
VPZ150-XX-VAR	DN150CF	203	136	22.3	6.5

With antireflection coating, broadband

Order code	Flange	A	D	L	L2
VPZ16-XX-BBAR	DN16CF	34	16	12.7	1
VPZ38-XX-BBAR	DN35CF	70	32	12.7	2.5
VPZ38LA-XX-BBAR	DN35CF	70	40	12.7	3
VPZ64-XX-BBAR	DN63CF	114	63	17.4	3
VPZ100-XX-BBAR	DN100CF	152	89	19.9	4
VPZ150-XX-BBAR	DN150CF	203	136	22.3	6.5

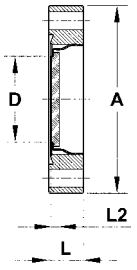
With lead glass screen

Order code	Flange	A	D	L	L2
VPZ16LG	DN16CF	34	16	12.7	1
VPZ38LG	DN35CF	70	32	12.7	2.5
VPZ64LG	DN63CF	114	63	17.4	3
VPZ100LG	DN100CF	152	89	19.9	4
VPZ150LG	DN150CF	203	136	22.3	6.5

Accessories, lead glass screen

Order code	Flange	D	L	Accessories for
LG16	DN16CF	17	5.0	VPZ16LG
LG38	DN35CF	40	5.0	VPZ38LG
LG64	DN63CF	70	5.0	VPZ64LG
LG100	DN100CF	93	5.0	VPZ100LG
LG150	DN150CF	143	5.0	VPZ150LG

Boron crown glass, BK7® optically polished, unexchangeable windows



Technical Data

Specifications	CF viewport with firmly connected BK7® windows
Connection	CF flange
Leakage rate	< 1.0E-10 mbar l/s
Material window	boron crown glass, BK7® optically polished
Material flange (magnetic)	stainless steel - 304L (1.4307)
Material flange (non-magnetic)	stainless steel - 316LN (1.4429)
Seal	various connections possible
Transmission range	0.4 - 2.0 µm
Min. transmission (without coating)	80 %
Temperature range	depends on connection method and material
Surface quality	20/10 (scratch/dig)
Flatness	< 8 λ (better surface quality and flatness on request)
Coatings • narrow band (1 QWOT) • narrow band (V coated) • broadband	for detailed information see introduction possible coating range 194 - 1200 nm
Options	Please add the required wavelength or wavelength range to the order code.
Connection method	The "XX" in the order code stands for the connection method. Please contact your customer consultant to define the appropriate connection for your application.

Standard

Order code		Flange	A	D	L	L2
Magnetic	**Non-magnetic**					
VPZ16BK7-XX	**VPZ16BK7-XX-NM**	DN16CF	34	16	12.7	3
VPZ38BK7-XX	**VPZ38BK7-XX-NM**	DN35CF	70	32	12.7	3
VPZ38LABK7-XX	**VPZ38LABK7-XX-NM**	DN35CF	70	40	12.7	3
VPZ64BK7-XX	**VPZ64BK7-XX-NM**	DN63CF	114	63	17.4	3
VPZ100BK7-XX	**VPZ100BK7-XX-NM**	DN100CF	152	89	19.9	4
VPZ150BK7-XX	**VPZ150BK7-XX-NM**	DN150CF	203	136	22.3	4

Boron crown glass, BK7® optically polished, unexchangeable windows

With antireflection coating, 1QWOT

Order code		Flange	A	D	L	L2
Magnetic	Non-magnetic					
VPZ16BK7-XX-AR	VPZ16BK7-XX-NM-AR	DN16CF	34	16	12.7	3
VPZ38BK7-XX-AR	VPZ38BK7-XX-NM-AR	DN35CF	70	32	12.7	3
VPZ38LABK7-XX-AR	VPZ38LABK7-XX-NM-AR	DN35CF	70	40	12.7	3
VPZ64BK7-XX-AR	VPZ64BK7-XX-NM-AR	DN63CF	114	63	17.4	3
VPZ100BK7-XX-AR	VPZ100BK7-XX-NM-AR	DN100CF	152	89	19.9	4
VPZ150BK7-XX-AR	VPZ150BK7-XX-NM-AR	DN150CF	203	136	22.3	4

With antireflection coating, V coated

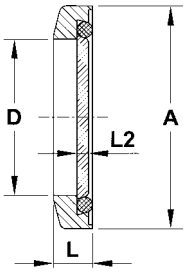
Order code		Flange	A	D	L	L2
Magnetic	Non-magnetic					
VPZ16BK7-XX-VAR	VPZ16BK7-XX-NM-VAR	DN16CF	34	16	12.7	3
VPZ38BK7-XX-VAR	VPZ38BK7-XX-NM-VAR	DN35CF	70	32	12.7	3
VPZ38LABK7-XX-VAR	VPZ38LABK7-XX-NM-VAR	DN35CF	70	40	12.7	3
VPZ64BK7-XX-VAR	VPZ64BK7-XX-NM-VAR	DN63CF	114	63	17.4	3
VPZ100BK7-XX-VAR	VPZ100BK7-XX-NM-VAR	DN100CF	152	89	19.9	4
VPZ150BK7-XX-VAR	VPZ150BK7-XX-NM-VAR	DN150CF	203	136	22.3	4

With antireflection coating, broadband

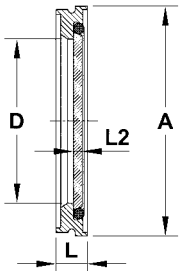
Order code		Flange	A	D	L	L2
Magnetic	Non-magnetic					
VPZ16BK7-XX-BBAR	VPZ16BK7-XX-NM-BBAR	DN16CF	34	16	12.7	3
VPZ38BK7-XX-BBAR	VPZ38BK7-XX-NM-BBAR	DN35CF	70	32	12.7	3
VPZ38LABK7-XX-BBAR	VPZ38LABK7-XX-NM-BBAR	DN35CF	70	40	12.7	3
VPZ64BK7-XX-BBAR	VPZ64BK7-XX-NM-BBAR	DN63CF	114	63	17.4	3
VPZ100BK7-XX-BBAR	VPZ100BK7-XX-NM-BBAR	DN100CF	152	89	19.9	4
VPZ150BK7-XX-BBAR	VPZ150BK7-XX-NM-BBAR	DN150CF	203	136	22.3	4

Quartz, exchangeable windows

KF flange



ISO flange



Technical Data

Specifications	KF and ISO-K viewport with exchangeable quartz windows - flat construction - easy assembly and disassembly
Connection	KF and ISO-K flange
Leakage rate	< 1.0E-8 mbar l/s
Material window	quartz
Material flange (magnetic)	stainless steel - 304L (1.4307)
Seal	FPM o-ring
Transmission range	0.3 - 4.0 µm
Min. transmission (without coating)	80 %
Temperature range	to 150 °C bakeable

Standard

Order code	Flange	A	D	L	L2
KVPZ40QTCRSV	DN40KF	57	40	10.0	3.8
KVPZ50QTCRSV	DN50KF	77	50	10.0	3.8
ISOVPZ63QTCRSV	DN63ISO	98	70	13.5	3.8
ISOVPZ100QTCRSV	DN100ISO	133	102	13.0	5
ISOVPZ160QTCRSV	DN160ISO	183	153	17.0	6

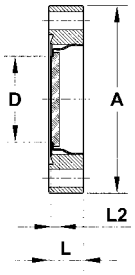
Accessories, replacement window

Order code	Flange	Accessories for
KF40VPQUARZ	DN40KF	KVPZ40QTCRSV
KF50VPQUARZ	DN50KF	KVPZ50QTCRSV
ISO63VPQUARZ	DN63ISO	ISOVPZ63QTCRSV
ISO100VPQUARZ	DN100ISO	ISOVPZ100QTCRSV
ISO160VPQUARZ	DN160ISO	ISOVPZ160QTCRSV

Accessories, replacement o-rings

Order code	Flange
KF40VR-VP	DN40KF
KF50VR-VP	DN50KF
ISO63VR-VP	DN63ISO
ISO100VR-VP	DN100ISO
ISO160VR-VP	DN160ISO

Quartz, fused silica Spectrosil 2000®, unexchangeable windows



Technical Data

Specifications	CF viewport with firmly connected quartz (fused silica Spectrosil 2000®) windows
Connection	CF flange
Leakage rate	< 1.0E-10 mbar l/s
Material window	fused silica Spectrosil 2000®
Material flange (magnetic)	stainless steel - 304L (1.4307)
Material flange (non-magnetic)	stainless steel - 316LN (1.4429)
Seal	various connections possible
Transmission range	0.19 - 2.0 µm
Min. transmission (without coating)	80 %
Temperature range	depends on connection method and material
Surface quality	20/10 (scratch/dig)
Flatness	< 8 λ (better surface quality and flatness on request)
Coatings • narrow band (1 QWOT) • narrow band (V coated) • broadband	for detailed information see introduction possible coating range 194 - 1200 nm
Options	Please add the required wavelength or wavelength range to the order code.
Connection method	The "XX" in the order code stands for the connection method. Please contact your customer consultant to define the appropriate connection for your application.

Standard

Order code		Flange	A	D	L	L2
Magnetic	**Non-magnetic**					
VPZ16QS-XX	**VPZ16QS-XX-NM**	DN16CF	34	16	12.7	1.5
VPZ38QS-XX	**VPZ38QS-XX-NM**	DN35CF	70	32	12.7	3
VPZ38LAQS-XX	**VPZ38LAQS-XX-NM**	DN35CF	70	40	12.7	3.5
VPZ64QS-XX	**VPZ64QS-XX-NM**	DN63CF	114	63	17.4	4.5
VPZ100QS-XX	**VPZ100QS-XX-NM**	DN100CF	152	89	19.9	6
VPZ150QS-XX	**VPZ150QS-XX-NM**	DN150CF	203	136	22.3	9.5

Quartz, fused silica Spectrosil 2000®, unexchangeable windows

With antireflection coating, 1QWOT

Order code		Flange	A	D	L	L2
Magnetic	Non-magnetic					
VPZ16QS-XX-AR	VPZ16QS-XX-NM-AR	DN16CF	34	16	12.7	1.5
VPZ38QS-XX-AR	VPZ38QS-XX-NM-AR	DN35CF	70	32	12.7	3
VPZ38LAQS-XX-AR	VPZ38LAQS-XX-NM-AR	DN35CF	70	40	12.7	3.5
VPZ64QS-XX-AR	VPZ64QS-XX-NM-AR	DN63CF	114	63	17.4	4.5
VPZ100QS-XX-AR	VPZ100QS-XX-NM-AR	DN100CF	152	89	19.9	6
VPZ150QS-XX-AR	VPZ150QS-XX-NM-AR	DN150CF	203	136	22.3	9.5

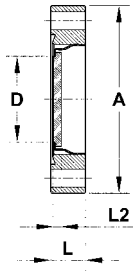
With antireflection coating, V coated

Order code		Flange	A	D	L	L2
Magnetic	Non-magnetic					
VPZ16QS-XX-VAR	VPZ16QS-XX-NM-VAR	DN16CF	34	16	12.7	1.5
VPZ38QS-XX-VAR	VPZ38QS-XX-NM-VAR	DN35CF	70	32	12.7	3
VPZ38LAQS-XX-VAR	VPZ38LAQS-XX-NM-VAR	DN35CF	70	40	12.7	3.5
VPZ64QS-XX-VAR	VPZ64QS-XX-NM-VAR	DN63CF	114	63	17.4	4.5
VPZ100QS-XX-VAR	VPZ100QS-XX-NM-VAR	DN100CF	152	89	19.9	6
VPZ150QS-XX-VAR	VPZ150QS-XX-NM-VAR	DN150CF	203	136	22.3	9.5

With antireflection coating, broadband

Order code		Flange	A	D	L	L2
Magnetic	Non-magnetic					
VPZ16QS-XX-BBAR	VPZ16QS-XX-NM-BBAR	DN16CF	34	16	12.7	1.5
VPZ38QS-XX-BBAR	VPZ38QS-XX-NM-BBAR	DN35CF	70	32	12.7	3
VPZ38LAQS-XX-BBAR	VPZ38LAQS-XX-NM-BBAR	DN35CF	70	40	12.7	3.5
VPZ64QS-XX-BBAR	VPZ64QS-XX-NM-BBAR	DN63CF	114	63	17.4	4.5
VPZ100QS-XX-BBAR	VPZ100QS-XX-NM-BBAR	DN100CF	152	89	19.9	6
VPZ150QS-XX-BBAR	VPZ150QS-XX-NM-BBAR	DN150CF	203	136	22.3	9.5

Quartz, C-cut, unexchangeable windows



Technical Data

Specifications	CF viewport with firmly connected quartz (C-cut) windows
Connection	CF flange
Leakage rate	< 1.0E-10 mbar l/s
Material window	quartz (C-cut)
Material flange (magnetic)	stainless steel - 304L (1.4307)
Material flange (non-magnetic)	stainless steel - 316LN (1.4429)
Seal	various connections possible
Transmission range	0.3 - 4.0 µm
Min. transmission (without coating)	80 %
Temperature range	depends on connection method and material
Surface quality	20/10 (scratch/dig)
Flatness	< 8 λ (better surface quality and flatness on request)
Coatings • narrow band (1 QWOT) • narrow band (V coated) • broadband	for detailed information see introduction possible coating range 194 - 1200 nm
Options	Please add the required wavelength or wavelength range to the order code.
Connection method	The "XX" in the order code stands for the connection method. Please contact your customer consultant to define the appropriate connection for your application.

Standard

Order code		Flange	A	D	L	L2
Magnetic	**Non-magnetic**					
VPZ16QCCUT-XX	**VPZ16QCCUT-XX-NM**	DN16CF	34	16	12.7	1.5
VPZ38QCCUT-XX	**VPZ38QCCUT-XX-NM**	DN35CF	70	32	12.7	3
VPZ38LAQCCUT-XX	**VPZ38LAQCCUT-XX-NM**	DN35CF	70	40	12.7	3.5
VPZ64QCCUT-XX	**VPZ64QCCUT-XX-NM**	DN63CF	114	63	17.4	4.5
VPZ100QCCUT-XX	**VPZ100QCCUT-XX-NM**	DN100CF	152	89	19.9	6
VPZ150QCCUT-XX	**VPZ150QCCUT-XX-NM**	DN150CF	203	136	22.3	9.5

Quartz, C-cut, unexchangeable windows

With antireflection coating, 1QWOT

Order code		Flange	A	D	L	L2
Magnetic	Non-magnetic					
VPZ16QCCUT-XX-AR	VPZ16QCCUT-XX-NM-AR	DN16CF	34	16	12.7	1.5
VPZ38QCCUT-XX-AR	VPZ38QCCUT-XX-NM-AR	DN35CF	70	32	12.7	3
VPZ38LAQCCUT-XX-AR	VPZ38LAQCCUT-XX-NM-AR	DN35CF	70	40	12.7	3.5
VPZ64QCCUT-XX-AR	VPZ64QCCUT-XX-NM-AR	DN63CF	114	63	17.4	4.5
VPZ100QCCUT-XX-AR	VPZ100QCCUT-XX-NM-AR	DN100CF	152	89	19.9	6
VPZ150QCCUT-XX-AR	VPZ150QCCUT-XX-NM-AR	DN150CF	203	136	22.3	9.5

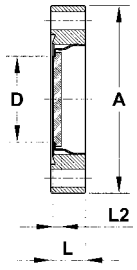
With antireflection coating, V coated

Order code		Flange	A	D	L	L2
Magnetic	Non-magnetic					
VPZ16QCCUT-XX-VAR	VPZ16QCCUT-XX-NM-VAR	DN16CF	34	16	12.7	1.5
VPZ38QCCUT-XX-VAR	VPZ38QCCUT-XX-NM-VAR	DN35CF	70	32	12.7	3
VPZ38LAQCCUT-XX-VAR	VPZ38LAQCCUT-XX-NM-VAR	DN35CF	70	40	12.7	3.5
VPZ64QCCUT-XX-VAR	VPZ64QCCUT-XX-NM-VAR	DN63CF	114	63	17.4	4.5
VPZ100QCCUT-XX-VAR	VPZ100QCCUT-XX-NM-VAR	DN100CF	152	89	19.9	6
VPZ150QCCUT-XX-VAR	VPZ150QCCUT-XX-NM-VAR	DN150CF	203	136	22.3	9.5

With antireflection coating, broadband

Order code		Flange	A	D	L	L2
Magnetic	Non-magnetic					
VPZ16QCCUT-XX-BBAR	VPZ16QCCUT-XX-NM-BBAR	DN16CF	34	16	12.7	1.5
VPZ38QCCUT-XX-BBAR	VPZ38QCCUT-XX-NM-BBAR	DN35CF	70	32	12.7	3
VPZ38LAQCCUT-XX-BBAR	VPZ38LAQCCUT-XX-NM-BBAR	DN35CF	70	40	12.7	3.5
VPZ64QCCUT-XX-BBAR	VPZ64QCCUT-XX-NM-BBAR	DN63CF	114	63	17.4	4.5
VPZ100QCCUT-XX-BBAR	VPZ100QCCUT-XX-NM-BBAR	DN100CF	152	89	19.9	6
VPZ150QCCUT-XX-BBAR	VPZ150QCCUT-XX-NM-BBAR	DN150CF	203	136	22.3	9.5

Quartz Z-cut, unexchangeable windows



Technical Data

Specifications	CF viewport with firmly connected quartz (Z-cut) windows
Connection	CF flange
Leakage rate	< 1.0E-10 mbar l / s
Material window	quartz (Z-cut)
Material flange (magnetic)	stainless steel - 304L (1.4307)
Material flange (non-magnetic)	stainless steel - 316LN (1.4429)
Seal	various connections possible
Transmission range	0.3 - 4.0 µm
Min. transmission (without coating)	80 %
Temperature range	depends on connection method and material
Surface quality	20/10 (scratch/dig)
Flatness	< 8 λ (better surface quality and flatness on request)
Coatings • narrow band (1 QWOT) • narrow band (V coated) • broadband	for detailed information see introduction possible coating range 194 - 1200 nm
Options	Please add the required wavelength or wavelength range to the order code.
Connection method	The "XX" in the order code stands for the connection method. Please contact your customer consultant to define the appropriate connection for your application.

Standard

Order code		Flange	A	D	L	L2
Magnetic	**Non-magnetic**					
VPZ16QZCUT-XX	**VPZ16QZCUT-XX-NM**	DN16CF	34	16	12.7	1.5
VPZ38QZCUT-XX	**VPZ38QZCUT-XX-NM**	DN35CF	70	32	12.7	3
VPZ38LAQZCUT-XX	**VPZ38LAQZCUT-XX-NM**	DN35CF	70	40	12.7	3.5
VPZ64QZCUT-XX	**VPZ64QZCUT-XX-NM**	DN63CF	114	63	17.4	4.5
VPZ100QZCUT-XX	**VPZ100QZCUT-XX-NM**	DN100CF	152	89	19.9	6
VPZ150QZCUT-XX	**VPZ150QZCUT-XX-NM**	DN150CF	203	136	22.3	9.5

Quartz Z-cut, unexchangeable windows

With antireflection coating, 1QWOT

Order code		Flange	A	D	L	L2
Magnetic	Non-magnetic					
VPZ16QZCUT-XX-AR	VPZ16QZCUT-XX-NM-AR	DN16CF	34	16	12.7	1.5
VPZ38QZCUT-XX-AR	VPZ38QZCUT-XX-NM-AR	DN35CF	70	32	12.7	3
VPZ38LAQZCUT-XX-AR	VPZ38LAQZCUT-XX-NM-AR	DN35CF	70	40	12.7	3.5
VPZ64QZCUT-XX-AR	VPZ64QZCUT-XX-NM-AR	DN63CF	114	63	17.4	4.5
VPZ100QZCUT-XX-AR	VPZ100QZCUT-XX-NM-AR	DN100CF	152	89	19.9	6
VPZ150QZCUT-XX-AR	VPZ150QZCUT-XX-NM-AR	DN150CF	203	136	22.3	9.5

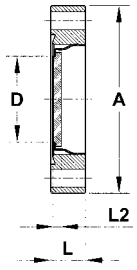
With antireflection coating, V coated

Order code		Flange	A	D	L	L2
Magnetic	Non-magnetic					
VPZ16QZCUT-XX-VAR	VPZ16QZCUT-XX-NM-VAR	DN16CF	34	16	12.7	1.5
VPZ38QZCUT-XX-VAR	VPZ38QZCUT-XX-NM-VAR	DN35CF	70	32	12.7	3
VPZ38LAQZCUT-XX-VAR	VPZ38LAQZCUT-XX-NM-VAR	DN35CF	70	40	12.7	3.5
VPZ64QZCUT-XX-VAR	VPZ64QZCUT-XX-NM-VAR	DN63CF	114	63	17.4	4.5
VPZ100QZCUT-XX-VAR	VPZ100QZCUT-XX-NM-VAR	DN100CF	152	89	19.9	6
VPZ150QZCUT-XX-VAR	VPZ150QZCUT-XX-NM-VAR	DN150CF	203	136	22.3	9.5

With antireflection coating, broadband

Order code		Flange	A	D	L	L2
Magnetic	Non-magnetic					
VPZ16QZCUT-XX-BBAR	VPZ16QZCUT-XX-NM-BBAR	DN16CF	34	16	12.7	1.5
VPZ38QZCUT-XX-BBAR	VPZ38QZCUT-XX-NM-BBAR	DN35CF	70	32	12.7	3
VPZ38LAQZCUT-XX-BBAR	VPZ38LAQZCUT-XX-NM-BBAR	DN35CF	70	40	12.7	3.5
VPZ64QZCUT-XX-BBAR	VPZ64QZCUT-XX-NM-BBAR	DN63CF	114	63	17.4	4.5
VPZ100QZCUT-XX-BBAR	VPZ100QZCUT-XX-NM-BBAR	DN100CF	152	89	19.9	6
VPZ150QZCUT-XX-BBAR	VPZ150QZCUT-XX-NM-BBAR	DN150CF	203	136	22.3	9.5

Magnesium fluoride optically polished, unexchangeable windows



Technical Data

Specifications	CF viewport with firmly connected magnesium fluoride windows
Connection	CF flange
Leakage rate	< 1.0E-10 mbar l/s
Material window	magnesium fluoride
Material flange (magnetic)	stainless steel - 304L (1.4307)
Material flange (non-magnetic)	stainless steel - 316LN (1.4429)
Seal	various connections possible
Transmission range	0.12 - 7.0 µm
Min. transmission (without coating)	80 %
Temperature range	depends on connection method and material
Surface quality	60/40 (scratch/dig)
Flatness	< 8 λ (better surface quality and flatness on request)
Coatings • narrow band (1 QWOT) • narrow band (V coated) • broadband	for detailed information see introduction possible coating range 194 - 1200 nm
Options	Please add the required wavelength or wavelength range to the order code.
Connection method	The "XX" in the order code stands for the connection method. Please contact your customer consultant to define the appropriate connection for your application.

Standard

Order code		Flange	A	D	L	L2
Magnetic	**Non-magnetic**					
VPZ16MGF2-XX	**VPZ16MGF2-XX-NM**	DN16CF	34	16	12.7	1.5
VPZ38MGF2-XX	**VPZ38MGF2-XX-NM**	DN35CF	70	32	12.7	3
VPZ38LAMGF2-XX	**VPZ38LAMGF2-XX-NM**	DN35CF	70	40	12.7	4
VPZ64MGF2-XX	**VPZ64MGF2-XX-NM**	DN63CF	114	63	17.4	5
VPZ100MGF2-XX	**VPZ100MGF2-XX-NM**	DN100CF	152	89	19.9	6.5
VPZ150MGF2-XX	**VPZ150MGF2-XX-NM**	DN150CF	203	136	22.3	9.5

Magnesium fluoride optically polished, unexchangeable windows

With antireflection coating, 1QWOT

Order code		Flange	A	D	L	L2
Magnetic	Non-magnetic					
VPZ16MGF2-XX-AR	VPZ16MGF2-XX-NM-AR	DN16CF	34	16	12.7	1.5
VPZ38MGF2-XX-AR	VPZ38MGF2-XX-NM-AR	DN35CF	70	32	12.7	3
VPZ38LAMGF2-XX-AR	VPZ38LAMGF2-XX-NM-AR	DN35CF	70	40	12.7	4
VPZ64MGF2-XX-AR	VPZ64MGF2-XX-NM-AR	DN63CF	114	63	17.5	5
VPZ100MGF2-XX-AR	VPZ100MGF2-XX-NM-AR	DN100CF	152	89	19.9	6.5
VPZ150MGF2-XX-AR	VPZ150MGF2-XX-NM-AR	DN150CF	203	136	22.3	9.5

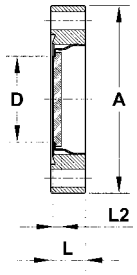
With antireflection coating, V coated

Order code		Flange	A	D	L	L2
Magnetic	Non-magnetic					
VPZ16MGF2-XX-VAR	VPZ16MGF2-XX-NM-VAR	DN16CF	34	16	12.7	1.5
VPZ38MGF2-XX-VAR	VPZ38MGF2-XX-NM-VAR	DN35CF	70	32	12.7	3
VPZ38LAMGF2-XX-VAR	VPZ38LAMGF2-XX-NM-VAR	DN35CF	70	40	12.7	4
VPZ64MGF2-XX-VAR	VPZ64MGF2-XX-NM-VAR	DN63CF	114	63	17.4	5
VPZ100MGF2-XX-VAR	VPZ100MGF2-XX-NM-VAR	DN100CF	152	89	19.9	6.5
VPZ150MGF2-XX-VAR	VPZ150MGF2-XX-NM-VAR	DN150CF	203	136	22.3	9.5

With antireflection coating, broadband

Order code		Flange	A	D	L	L2
Magnetic	Non-magnetic					
VPZ16MGF2-XX-BBAR	VPZ16MGF2-XX-NM-BBAR	DN16CF	34	16	12.7	1.5
VPZ38MGF2-XX-BBAR	VPZ38MGF2-XX-NM-BBAR	DN35CF	70	32	12.7	3
VPZ38LAMGF2-XX-BBAR	VPZ38LAMGF2-XX-NM-BBAR	DN35CF	70	40	12.7	4
VPZ64MGF2-XX-BBAR	VPZ64MGF2-XX-NM-BBAR	DN63CF	114	63	17.4	5
VPZ100MGF2-XX-BBAR	VPZ100MGF2-XX-NM-BBAR	DN100CF	152	89	19.9	6.5
VPZ150MGF2-XX-BBAR	VPZ150MGF2-XX-NM-BBAR	DN150CF	203	136	22.3	9.5

Calcium fluoride optically polished, unexchangeable windows



Technical Data

Specifications	CF viewport with firmly connected calcium fluoride windows
Connection	CF flange
Leakage rate	< 1.0E-10 mbar l / s
Material window	calcium fluoride
Material flange (magnetic)	stainless steel - 304L (1.4307)
Material flange (non-magnetic)	stainless steel - 316LN (1.4429)
Seal	various connections possible
Transmission range	0.13 - 10.0 µm
Min. transmission (without coating)	80 %
Temperature range	depends on connection method and material
Surface quality	80/50 (scratch/dig)
Flatness	< 8 λ (better surface quality and flatness on request)
Coatings • narrow band (1 QWOT) • narrow band (V coated) • broadband	for detailed information see introduction possible coating range 194 - 1200 nm
Options	Please add the required wavelength or wavelength range to the order code.
Connection method	The "XX" in the order code stands for the connection method. Please contact your customer consultant to define the appropriate connection for your application.

Standard

Order code		Flange	A	D	L	L2
Magnetic	**Non-magnetic**					
VPZ16CAF2-XX	**VPZ16CAF2-XX-NM**	DN16CF	34	16	12.7	1.5
VPZ38CAF2-XX	**VPZ38CAF2-XX-NM**	DN35CF	70	32	12.7	3
VPZ38LACAF2-XX	**VPZ38LACAF2-XX-NM**	DN35CF	70	40	12.7	4
VPZ64CAF2-XX	**VPZ64CAF2-XX-NM**	DN63CF	114	63	17.4	5
VPZ100CAF2-XX	**VPZ100CAF2-XX-NM**	DN100CF	152	89	19.9	7
VPZ150CAF2-XX	**VPZ150CAF2-XX-NM**	DN150CF	203	136	22.3	11

Calcium fluoride optically polished, unexchangeable windows

With antireflection coating, 1QWOT

Order code		Flange	A	D	L	L2
Magnetic	Non-magnetic					
VPZ16CAF2-XX-AR	VPZ16CAF2-XX-NM-AR	DN16CF	34	16	12.7	1.5
VPZ38CAF2-XX-AR	VPZ38CAF2-XX-NM-AR	DN35CF	70	32	12.7	3
VPZ38LACAF2-XX-AR	VPZ38LACAF2-XX-NM-AR	DN35CF	70	40	12.7	4
VPZ64CAF2-XX-AR	VPZ64CAF2-XX-NM-AR	DN63CF	114	63	17.4	5
VPZ100CAF2-XX-AR	VPZ100CAF2-XX-NM-AR	DN100CF	152	89	19.9	7
VPZ150CAF2-XX-AR	VPZ150CAF2-XX-NM-AR	DN150CF	203	136	22.3	11

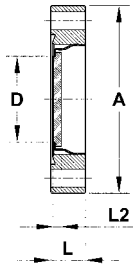
With antireflection coating, V coated

Order code		Flange	A	D	L	L2
Magnetic	Non-magnetic					
VPZ16CAF2-XX-VAR	VPZ16CAF2-XX-NM-VAR	DN16CF	34	16	12.7	1.5
VPZ38CAF2-XX-VAR	VPZ38CAF2-XX-NM-VAR	DN35CF	70	32	12.7	3
VPZ38LACAF2-XX-VAR	VPZ38LACAF2-XX-NM-VAR	DN35CF	70	40	12.7	4
VPZ64CAF2-XX-VAR	VPZ64CAF2-XX-NM-VAR	DN63CF	114	63	17.4	5
VPZ100CAF2-XX-VAR	VPZ100CAF2-XX-NM-VAR	DN100CF	152	89	19.9	7
VPZ150CAF2-XX-VAR	VPZ150CAF2-XX-NM-VAR	DN150CF	203	136	22.3	11

With antireflection coating, broadband

Order code		Flange	A	D	L	L2
Magnetic	Non-magnetic					
VPZ16CAF2-XX-BBAR	VPZ16CAF2-XX-NM-BBAR	DN16CF	34	16	12.7	1.5
VPZ38CAF2-XX-BBAR	VPZ38CAF2-XX-NM-BBAR	DN35CF	70	32	12.7	3
VPZ38LACAF2-XX-BBAR	VPZ38LACAF2-XX-NM-BBAR	DN35CF	70	40	12.7	4
VPZ64CAF2-XX-BBAR	VPZ64CAF2-XX-NM-BBAR	DN63CF	114	63	17.4	5
VPZ100CAF2-XX-BBAR	VPZ100CAF2-XX-NM-BBAR	DN100CF	152	89	19.9	7
VPZ150CAF2-XX-BBAR	VPZ150CAF2-XX-NM-BBAR	DN150CF	203	136	22.3	11

Barium fluoride optically polished, unexchangeable windows



Technical Data

Specifications	CF viewport with firmly connected barium fluoride windows
Connection	CF flange
Leakage rate	< 1.0E-10 mbar l / s
Material window	barium fluoride
Material flange (magnetic)	stainless steel - 304L (1.4307)
Material flange (non-magnetic)	stainless steel - 316LN (1.4429)
Seal	various connections possible
Transmission range	0.15 - 12.5 µm
Min. transmission (without coating)	80 %
Temperature range	depends on connection method and material
Surface quality	60/40 (scratch/dig)
Flatness	< 8 λ (better surface quality and flatness on request)
Coatings • narrow band (1 QWOT) • narrow band (V coated) • broadband	for detailed information see introduction possible coating range 194 - 1200 nm
Options	Please add the required wavelength or wavelength range to the order code.
Connection method	The "XX" in the order code stands for the connection method. Please contact your customer consultant to define the appropriate connection for your application.

Standard

Order code		Flange	A	D	L	L2
Magnetic	**Non-magnetic**					
VPZ16BAF2-XX	**VPZ16BAF2-XX-NM**	DN16CF	34	16	12.7	2
VPZ38BAF2-XX	**VPZ38BAF2-XX-NM**	DN35CF	70	32	12.7	3
VPZ38LABAF2-XX	**VPZ38LABAF2-XX-NM**	DN35CF	70	40	12.7	5
VPZ64BAF2-XX	**VPZ64BAF2-XX-NM**	DN63CF	114	63	17.4	7
VPZ100BAF2-XX	**VPZ100BAF2-XX-NM**	DN100CF	152	89	19.9	9
VPZ150BAF2-XX	**VPZ150BAF2-XX-NM**	DN150CF	203	136	22.3	14

Barium fluoride optically polished, unexchangeable windows

With antireflection coating, 1QWOT

Order code		Flange	A	D	L	L2
Magnetic	Non-magnetic					
VPZ16BAF2-XX-AR	VPZ16BAF2-XX-NM-AR	DN16CF	34	16	12.7	2
VPZ38BAF2-XX-AR	VPZ38BAF2-XX-NM-AR	DN35CF	70	32	12.7	3
VPZ38LABAF2-XX-AR	VPZ38LABAF2-XX-NM-AR	DN35CF	70	40	12.7	5
VPZ64BAF2-XX-AR	VPZ64BAF2-XX-NM-AR	DN63CF	114	63	17.4	7
VPZ100BAF2-XX-AR	VPZ100BAF2-XX-NM-AR	DN100CF	152	89	19.9	9
VPZ150BAF2-XX-AR	VPZ150BAF2-XX-NM-AR	DN150CF	203	136	22.3	14

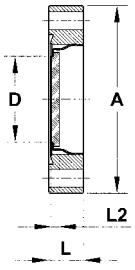
With antireflection coating, V coated

Order code		Flange	A	D	L	L2
Magnetic	Non-magnetic					
VPZ16BAF2-XX-VAR	VPZ16BAF2-XX-NM-VAR	DN16CF	34	16	12.7	2
VPZ38BAF2-XX-VAR	VPZ38BAF2-XX-NM-VAR	DN35CF	70	32	12.7	3
VPZ38LABAF2-XX-VAR	VPZ38LABAF2-XX-NM-VAR	DN35CF	70	40	12.7	5
VPZ64BAF2-XX-VAR	VPZ64BAF2-XX-NM-VAR	DN63CF	114	63	17.4	7
VPZ100BAF2-XX-VAR	VPZ100BAF2-XX-NM-VAR	DN100CF	152	89	19.9	9
VPZ150BAF2-XX-VAR	VPZ150BAF2-XX-NM-VAR	DN150CF	203	136	22.3	14

With antireflection coating, broadband

Order code		Flange	A	D	L	L2
Magnetic	Non-magnetic					
VPZ16BAF2-XX-BBAR	VPZ16BAF2-XX-NM-BBAR	DN16CF	34	16	12.7	2
VPZ38BAF2-XX-BBAR	VPZ38BAF2-XX-NM-BBAR	DN35CF	70	32	12.7	3
VPZ38LABAF2-XX-BBAR	VPZ38LABAF2-XX-NM-BBAR	DN35CF	70	40	12.7	5
VPZ64BAF2-XX-BBAR	VPZ64BAF2-XX-NM-BBAR	DN63CF	114	63	17.4	7
VPZ100BAF2-XX-BBAR	VPZ100BAF2-XX-NM-BBAR	DN100CF	152	89	19.9	9
VPZ150BAF2-XX-BBAR	VPZ150BAF2-XX-NM-BBAR	DN150CF	203	136	22.3	14

Lithium fluoride optically polished, unexchangeable windows



Technical Data

Specifications	CF viewport with firmly connected lithium fluoride windows
Connection	CF flange
Leakage rate	< 1.0E-10 mbar l / s
Material window	lithium fluoride
Material flange (magnetic)	stainless steel - 304L (1.4307)
Material flange (non-magnetic)	stainless steel - 316LN (1.4429)
Seal	various connections possible
Transmission range	0.12 - 6.0 µm
Min. transmission (without coating)	80 %
Temperature range	depends on connection method and material
Surface quality	60/40 (scratch/dig)
Flatness	< 8 λ (better surface quality and flatness on request)
Coatings • narrow band (1 QWOT) • narrow band (V coated) • broadband	for detailed information see introduction possible coating range 194 - 1200 nm
Options	Please add the required wavelength or wavelength range to the order code.
Connection method	The "XX" in the order code stands for the connection method. Please contact your customer consultant to define the appropriate connection for your application.

Standard

Order code		Flange	A	D	L	L2
Magnetic	**Non-magnetic**					
VPZ16LIF2-XX	**VPZ16LIF2-XX-NM**	DN16CF	34	16	12.7	2
VPZ38LIF2-XX	**VPZ38LIF2-XX-NM**	DN35CF	70	32	12.7	5
VPZ38LALIF2-XX	**VPZ38LALIF2-XX-NM**	DN35CF	70	40	12.7	7
VPZ64LIF2-XX	**VPZ64LIF2-XX-NM**	DN63CF	114	63	17.4	10
VPZ100LIF2-XX	**VPZ100LIF2-XX-NM**	DN100CF	152	89	19.9	14
VPZ150LIF2-XX	**VPZ150LIF2-XX-NM**	DN150CF	203	136	22.3	20

Lithium fluoride optically polished, unexchangeable windows

With antireflection coating, 1QWOT

Order code		Flange	A	D	L	L2
Magnetic	Non-magnetic					
VPZ16LIF2-XX-AR	VPZ16LIF2-XX-NM-AR	DN16CF	34	16	12.7	2
VPZ38LIF2-XX-AR	VPZ38LIF2-XX-NM-AR	DN35CF	70	32	12.7	5
VPZ38LALIF2-XX-AR	VPZ38LALIF2-XX-NM-AR	DN35CF	70	40	12.7	7
VPZ64LIF2-XX-AR	VPZ64LIF2-XX-NM-AR	DN63CF	114	63	17.4	10
VPZ100LIF2-XX-AR	VPZ100LIF2-XX-NM-AR	DN100CF	152	89	19.9	14
VPZ150LIF2-XX-AR	VPZ150LIF2-XX-NM-AR	DN150CF	203	136	22.3	20

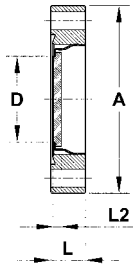
With antireflection coating, V coated

Order code		Flange	A	D	L	L2
Magnetic	Non-magnetic					
VPZ16LIF2-XX-VAR	VPZ16LIF2-XX-NM-VAR	DN16CF	34	16	12.7	2
VPZ38LIF2-XX-VAR	VPZ38LIF2-XX-NM-VAR	DN35CF	70	32	12.7	5
VPZ38LALIF2-XX-VAR	VPZ38LALIF2-XX-NM-VAR	DN35CF	70	40	12.7	7
VPZ64LIF2-XX-VAR	VPZ64LIF2-XX-NM-VAR	DN63CF	114	63	17.4	10
VPZ100LIF2-XX-VAR	VPZ100LIF2-XX-NM-VAR	DN100CF	152	89	19.9	14
VPZ150LIF2-XX-VAR	VPZ150LIF2-XX-NMVAR	DN150CF	203	136	22.3	20

With antireflection coating, broadband

Order code		Flange	A	D	L	L2
Magnetic	Non-magnetic					
VPZ16LIF2-XX-BBAR	VPZ16LIF2-XX-NM-BBAR	DN16CF	34	16	12.7	2
VPZ38LIF2-XX-BBAR	VPZ38LIF2-XX-NM-BBAR	DN35CF	70	32	12.7	5
VPZ38LALIF2-XX-BBAR	VPZ38LALIF2-XX-NM-BBAR	DN35CF	70	40	12.7	7
VPZ64LIF2-XX-BBAR	VPZ64LIF2-XX-NM-BBAR	DN63CF	114	63	17.4	10
VPZ100LIF2-XX-BBAR	VPZ100LIF2-XX-NM-BBAR	DN100CF	152	89	19.9	14
VPZ150LIF2-XX-BBAR	VPZ150LIF2-XX-NM-BBAR	DN150CF	203	136	22.3	20

IR optics, sapphire optically polished, unexchangeable windows



Technical Data

Specifications	CF viewport with firmly connected sapphire windows
Connection	CF flange
Leakage rate	< 1.0E-10 mbar l / s
Material window	sapphire
Material flange (magnetic)	stainless steel - 304L (1.4307)
Material flange (non-magnetic)	stainless steel - 316LN (1.4429)
Seal	various connections possible
Transmission range	0.17 - 5.5 µm
Min. transmission (without coating)	80 %
Temperature range	depends on connection method and material
Surface quality	20/10 (scratch/dig)
Flatness	< 8 λ (better surface quality and flatness on request)
Coatings • narrow band (1 QWOT) • narrow band (V coated) • broadband	for detailed information see introduction possible coating range 194 - 1200 nm
Options	Please add the required wavelength or wavelength range to the order code.
Connection method	The "XX" in the order code stands for the connection method. Please contact your customer consultant to define the appropriate connection for your application.

Standard

Order code		Flange	A	D	L	L2
Magnetic	**Non-magnetic**					
VPZ16S-XX	**VPZ16S-XX-NM**	DN16CF	34	16	12.7	1.5
VPZ38S-XX	**VPZ38S-XX-NM**	DN35CF	70	32	12.7	1.5
VPZ38LAS-XX	**VPZ38LAS-XX-NM**	DN35CF	70	40	12.7	1.5
VPZ64S-XX	**VPZ64S-XX-NM**	DN63CF	114	63	17.4	2
VPZ100S-XX	**VPZ100S-XX-NM**	DN100CF	152	89	19.9	3
VPZ150S-XX	**VPZ150S-XX-NM**	DN150CF	203	136	22.3	4

IR optics, sapphire optically polished, unexchangeable windows

With antireflection coating, 1QWOT

Order code		Flange	A	D	L	L2
Magnetic	Non-magnetic					
VPZ16S-XX-AR	VPZ16S-XX-NM-AR	DN16CF	34	16	12.7	1.5
VPZ38S-XX-AR	VPZ38S-XX-NM-AR	DN35CF	70	32	12.7	1.5
VPZ38LAS-XX-AR	VPZ38LAS-XX-NM-AR	DN35CF	70	40	12.7	1.5
VPZ64S-XX-AR	VPZ64S-XX-NM-AR	DN63CF	114	63	17.4	2
VPZ100S-XX-AR	VPZ100S-XX-NM-AR	DN100CF	152	89	19.9	3
VPZ150S-XX-AR	VPZ150S-XX-NM-AR	DN150CF	203	136	22.3	4

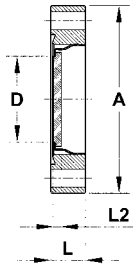
With antireflection coating, V coated

Order code		Flange	A	D	L	L2
Magnetic	Non-magnetic					
VPZ16S-XX-VAR	VPZ16S-XX-NM-VAR	DN16CF	34	16	12.7	1.5
VPZ38S-XX-VAR	VPZ38S-XX-NM-VAR	DN35CF	70	32	12.7	1.5
VPZ38LAS-XX-VAR	VPZ38LAS-XX-NM-VAR	DN35CF	70	40	12.7	1.5
VPZ64S-XX-VAR	VPZ64S-XX-NM-VAR	DN63CF	114	63	17.4	2
VPZ100S-XX-VAR	VPZ100S-XX-NM-VAR	DN100CF	152	89	19.9	3
VPZ150S-XX-VAR	VPZ150S-XX-NM-VAR	DN150CF	203	136	22.3	4

With antireflection coating, broadband

Order code		Flange	A	D	L	L2
Magnetic	Non-magnetic					
VPZ16S-XX-BBAR	VPZ16S-XX-NM-BBAR	DN16CF	34	16	12.7	1.5
VPZ38S-XX-BBAR	VPZ38S-XX-NM-BBAR	DN35CF	70	32	12.7	1.5
VPZ38LAS-XX-BBAR	VPZ38LAS-XX-NM-BBAR	DN35CF	70	40	12.7	1.5
VPZ64S-XX-BBAR	VPZ64S-XX-NM-BBAR	DN63CF	114	63	17.4	2
VPZ100S-XX-BBAR	VPZ100S-XX-NM-BBAR	DN100CF	152	89	19.9	3
VPZ150S-XX-BBAR	VPZ150S-XX-NM-BBAR	DN150CF	203	136	22.3	4

IR optics, zinc selenide optically polished, unexchangeable windows



Technical Data

Specifications	CF viewport with firmly connected zinc selenide windows
Connection	CF flange
Leakage rate	< 1.0E-10 mbar l / s
Material window	zinc selenide (optically polished)
Material flange (magnetic)	stainless steel - 304L (1.4307)
Material flange (non-magnetic)	stainless steel - 316LN (1.4429)
Seal	various connections possible
Transmission range	0.6 - 21.0 µm
Min. transmission (without coating)	60 %
Temperature range	depends on connection method and material
Surface quality	60/40 (scratch/dig)
Flatness	< 8 λ (better surface quality and flatness on request)
Coatings • AR 10.6	for detailed information see introduction antireflexion coating at 10.6 µm
Connection method	The "XX" in the order code stands for the connection method. Please contact your customer consultant to define the appropriate connection for your application.

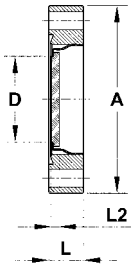
Standard

Order code		Flange	A	D	L	L2
Magnetic	**Non-magnetic**					
VPZ16ZNSE-XX	**VPZ16ZNSE-XX-NM**	DN16CF	34	16	12.7	1.5
VPZ38ZNSE-XX	**VPZ38ZNSE-XX-NM**	DN35CF	70	32	12.7	3
VPZ38LAZNSE-XX	**VPZ38LAZNSE-XX-NM**	DN35CF	70	40	12.7	3.75
VPZ64ZNSE-XX	**VPZ64ZNSE-XX-NM**	DN63CF	114	63	17.4	5
VPZ100ZNSE-XX	**VPZ100ZNSE-XX-NM**	DN100CF	152	89	19.9	6.5
VPZ150ZNSE-XX	**VPZ150ZNSE-XX-NM**	DN150CF	203	136	22.3	9.5

With antireflection coating, AR 10.6

Order code		Flange	A	D	L	L2
Magnetic	**Non-magnetic**					
VPZ16ZNSE-XX-AR-10600	**VPZ16ZNSE-XX-NM-AR-10600**	DN16CF	34	16	12.7	1.5
VPZ38ZNSE-XX-AR-10600	**VPZ38ZNSE-XX-NM-AR-10600**	DN35CF	70	32	12.7	3
VPZ38LAZNSE-XX-AR-10600	**VPZ38LAZNSE-XX-NM-AR-1060**	DN35CF	70	40	12.7	3.75
VPZ64ZNSE-XX-AR-10600	**VPZ64ZNSE-XX-NM-AR-10600**	DN63CF	114	63	17.4	5
VPZ100ZNSE-XX-AR-10600	**VPZ100ZNSE-XX-NM-AR-10600**	DN100CF	152	89	19.9	6.5
VPZ150ZNSE-XX-AR-10600	**VPZ150ZNSE-XX-NM-AR-10600**	DN150CF	203	136	22.3	9.5

IR optics, zinc sulfide optically polished, unexchangeable windows



Technical Data

Specifications	CF viewport with firmly connected zinc sulfide windows
Connection	CF flange
Leakage rate	< 1.0E-10 mbar l / s
Material window	zinc sulfide
Material flange (magnetic)	stainless steel - 304L (1.4307)
Material flange (non-magnetic)	stainless steel - 316LN (1.4429)
Seal	various connections possible
Transmission range	0.37 - 13.5 µm
Min. transmission (without coating)	60 %
Temperature range	depends on connection method and material
Surface quality	60/40 (scratch/dig)
Flatness	< 8 λ (better surface quality and flatness on request)
Coatings • AR 10.6	for detailed information see introduction antireflexion coating at 10.6 µm
Connection method	The "XX" in the order code stands for the connection method. Please contact your customer consultant to define the appropriate connection for your application.

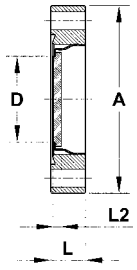
Standard

Order code		Flange	A	D	L	L2
Magnetic	**Non-magnetic**					
VPZ16ZNS-XX	**VPZ16ZNS-XX-NM**	DN16CF	34	16	12.7	1.5
VPZ38ZNS-XX	**VPZ38ZNS-XX-NM**	DN35CF	70	32	12.7	3
VPZ38LAZNS-XX	**VPZ38LAZNS-XX-NM**	DN35CF	70	40	12.7	3.5
VPZ64ZNS-XX	**VPZ64ZNS-XX-NM**	DN63CF	114	63	17.4	5
VPZ100ZNS-XX	**VPZ100ZNS-XX-NM**	DN100CF	152	89	19.9	6
VPZ150ZNS-XX	**VPZ150ZNS-XX-NM**	DN150CF	203	136	22.3	9.5

With antireflection coating, AR 10.6

Order code		Flange	A	D	L	L2
Magnetic	**Non-magnetic**					
VPZ16ZNS-XX-AR-10600	**VPZ16ZNS-XX-NM-AR-10600**	DN16CF	34	16	12.7	1.5
VPZ38ZNS-XX-AR-10600	**VPZ38ZNS-XX-NM-AR-10600**	DN35CF	70	32	12.7	3
VPZ38LAZNS-XX-AR-10600	**VPZ38LAZNS-XX-NM-AR-10600**	DN35CF	70	40	12.7	3.5
VPZ64ZNS-XX-AR-10600	**VPZ64ZNS-XX-NM-AR-10600**	DN63CF	114	63	17.4	5
VPZ100ZNS-XX-AR-10600	**VPZ100ZNS-XX-NM-AR-10600**	DN100CF	152	89	19.9	6
VPZ150ZNS-XX-AR-10600	**VPZ150ZNS-XX-NM-AR-10600**	DN150CF	203	136	22.3	9.5

IR optics, silicon optically polished, unexchangeable windows



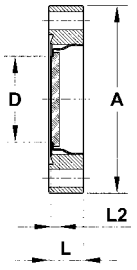
Technical Data

Specifications	CF viewport with firmly connected silicon windows
Connection	CF flange
Leakage rate	< 1.0E-10 mbar l / s
Material window	silicon optically polished
Material flange (magnetic)	stainless steel - 304L (1.4307)
Material flange (non-magnetic)	stainless steel - 316LN (1.4429)
Seal	various connections possible
Transmission range	1.2 - 15.0 µm
Min. transmission (without coating)	80 %
Temperature range	depends on connection method and material
Surface quality	20/10 (scratch/dig)
Flatness	< 8 λ (better surface quality and flatness on request)
Connection method	The "XX" in the order code stands for the connection method. Please contact your customer consultant to define the appropriate connection for your application.

Standard

Order code		Flange	A	D	L	L2
Magnetic	**Non-magnetic**					
VPZ16SI-XX	**VPZ16SI-XX-NM**	DN16CF	34	16	12.7	2
VPZ38SI-XX	**VPZ38SI-XX-NM**	DN35CF	70	32	12.7	3
VPZ38LASI-XX	**VPZ38LASI-XX-NM**	DN35CF	70	40	12.7	3
VPZ64SI-XX	**VPZ64SI-XX-NM**	DN63CF	114	63	17.4	4
VPZ100SI-XX	**VPZ100SI-XX-NM**	DN100CF	152	89	19.9	4.5
VPZ150SI-XX	**VPZ150SI-XX-NM**	DN150CF	203	136	22.3	7.5

IR optics, germanium optically polished, unexchangeable windows



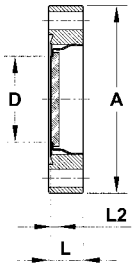
Technical Data

Specifications	CF viewport with firmly connected germanium windows
Connection	CF flange
Leakage rate	< 1.0E-10 mbar l / s
Material window	germanium optically polished
Material flange (magnetic)	stainless steel - 304L (1.4307)
Material flange (non-magnetic)	stainless steel - 316LN (1.4429)
Seal	various connections possible
Transmission range	1.8 - 23.0 µm
Min. transmission (without coating)	80 %
Temperature range	depends on connection method and material
Surface quality	20/10 (scratch/dig)
Flatness	< 8 λ (better surface quality and flatness on request)
Connection method	The "XX" in the order code stands for the connection method. Please contact your customer consultant to define the appropriate connection for your application.

Standard

Order code		Flange	A	D	L	L2
Magnetic	**Non-magnetic**					
VPZ16GE-XX	**VPZ16GE-XX-NM**	DN16CF	34	16	12.7	2
VPZ38GE-XX	**VPZ38GE-XX-NM**	DN35CF	70	32	12.7	3
VPZ38LAGE-XX	**VPZ38LAGE-XX-NM**	DN35CF	70	40	12.7	3
VPZ64GE-XX	**VPZ64GE-XX-NM**	DN63CF	114	63	17.4	4
VPZ100GE-XX	**VPZ100GE-XX-NM**	DN100CF	152	89	19.9	4.5
VPZ150GE-XX	**VPZ150GE-XX-NM**	DN150CF	203	136	22.3	7.5

Borosilicate, unexchangeable windows



Technical Data

Specifications	CF viewport with firmly connected borosilicate windows
Connection	CF flange
Leakage rate	< 1.0E-10 mbar l / s
Material window	borosilicate
Material flange (magnetic)	stainless steel - 304L (1.4307)
Material flange (non-magnetic)	stainless steel - 316LN (1.4429)
Seal	various connections possible
Transmission range	0.4 - 2.0 µm
Min. transmission (without coating)	80 %
Temperature range	depends on connection method and material
Surface quality	80/50 (scratch/dig)
Coatings • ITO • ITO and RHEED screen	for detailed information see introduction standard phosphor types are P11, P20, P22 and P43 further types on request
Connection method	The "XX" in the order code stands for the connection method. Please contact your customer consultant to define the appropriate connection for your application.

With ITO coating

Order code		Flange	A	D	L	L2
Magnetic	**Non-magnetic**					
VPZ16ITO-XX	**VPZ16ITO-XX-NM**	DN16CF	34	16	12.7	1
VPZ38ITO-XX	**VPZ38ITO-XX-NM**	DN35CF	70	32	12.7	2.5
VPZ38LAITO-XX	**VPZ38LAITO-XX-NM**	DN35CF	70	40	12.7	3
VPZ64ITO-XX	**VPZ64ITO-XX-NM**	DN63CF	114	63	17.4	3
VPZ100ITO-XX	**VPZ100ITO-XX-NM**	DN100CF	152	89	19.9	4
VPZ150ITO-XX	**VPZ150ITO-XX-NM**	DN150CF	203	136	22.3	6.5

With ITO coating and lead glass screen

Order code		Flange	A	D	L	L2
Magnetic	**Non-magnetic**					
VPZ16ITOLG-XX	**VPZ16ITOLG-XX-NM**	DN16CF	34	16	12.7	1
VPZ38ITOLG-XX	**VPZ38ITOLG-XX-NM**	DN35CF	70	32	12.7	2.5
VPZ64ITOLG-XX	**VPZ64ITOLG-XX-NM**	DN63CF	114	63	17.4	3
VPZ100ITOLG-XX	**VPZ100ITOLG-XX-NM**	DN100CF	152	89	19.9	4
VPZ150ITOLG-XX	**VPZ150ITOLG-XX-NM**	DN150CF	203	136	22.3	6.5

Borosilicate, unexchangeable windows

With ITO coating and RHEED screen, phosphor-11

Order code		Flange	A	D	L	L2
Magnetic	Non-magnetic					
VPZ16ITO-XX-11	VPZ16ITO-XX-NM-11	DN16CF	34	16	12.7	1
VPZ38ITO-XX-11	VPZ38ITO-XX-NM-11	DN35CF	70	32	12.7	2.5
VPZ38LAITO-XX-11	VPZ38LAITO-XX-NM-11	DN35CF	70	40	12.7	3
VPZ64ITO-XX-11	VPZ64ITO-XX-NM-11	DN63CF	114	63	17.4	3
VPZ100ITO-XX-11	VPZ100ITO-XX-NM-11	DN100CF	152	89	19.9	4
VPZ150ITO-XX-11	VPZ150ITO-XX-NM-11	DN150CF	203	136	22.3	6.5

With ITO coating and RHEED screen, phosphor-20

Order code		Flange	A	D	L	L2
Magnetic	Non-magnetic					
VPZ16ITO-XX-20	VPZ16ITO-XX-NM-20	DN16CF	34	16	12.7	1
VPZ38ITO-XX-20	VPZ38ITO-XX-NM-20	DN35CF	70	32	12.7	2.5
VPZ38LAITO-XX-20	VPZ38LAITO-XX-NM-20	DN35CF	70	40	12.7	3
VPZ64ITO-XX-20	VPZ64ITO-XX-NM-20	DN63CF	114	63	17.4	3
VPZ100ITO-XX-20	VPZ100ITO-XX-NM-20	DN100CF	152	89	19.9	4
VPZ150ITO-XX-20	VPZ150ITO-XX-NM-20	DN150CF	203	136	22.3	6.5

With ITO coating and RHEED screen, phosphor-22

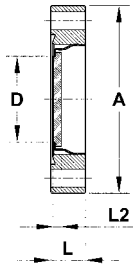
Order code		Flange	A	D	L	L2
Magnetic	Non-magnetic					
VPZ16ITO-XX-22	VPZ16ITO-XX-NM-22	DN16CF	34	16	12.7	1
VPZ38ITO-XX-22	VPZ38ITO-XX-NM-22	DN35CF	70	32	12.7	2.5
VPZ38LAITO-XX-22	VPZ38LAITO-XX-NM-22	DN35CF	70	40	12.7	3
VPZ64ITO-XX-22	VPZ64ITO-XX-NM-22	DN63CF	114	63	17.4	3
VPZ100ITO-XX-22	VPZ100ITO-XX-NM-22	DN100CF	152	89	19.9	4
VPZ150ITO-XX-22	VPZ150ITO-XX-NM-22	DN150CF	203	136	22.3	6.5

With ITO coating and RHEED screen, phosphor-43

Order code		Flange	A	D	L	L2
Magnetic	Non-magnetic					
VPZ16ITO-XX-43	VPZ16ITO-XX-NM-43	DN16CF	34	16	12.7	1
VPZ38ITO-XX-43	VPZ38ITO-XX-NM-43	DN35CF	70	32	12.7	2.5
VPZ38LAITO-XX-43	VPZ38LAITO-XX-NM-43	DN35CF	70	40	12.7	3
VPZ64ITO-XX-43	VPZ64ITO-XX-NM-43	DN63CF	114	63	17.4	3
VPZ100ITO-XX-43	VPZ100ITO-XX-NM-43	DN100CF	152	89	19.9	4
VPZ150ITO-XX-43	VPZ150ITO-XX-NM-43	DN150CF	203	136	22.3	6.5

Special Viewports

Special, beryllium, unexchangeable windows



Technical Data

Specifications	CF viewport with firmly connected beryllium windows
Connection	CF flange
Leakage rate	< 1.0E-10 mbar l / s
Material window	beryllium
Material flange (magnetic)	stainless steel - 304L (1.4307)
Material flange (non-magnetic)	stainless steel - 316LN (1.4429)
Seal	various connections possible
Temperature range	depends on connection method and material
Connection method	The "XX" in the order code stands for the connection method. Please contact your customer consultant to define the appropriate connection for your application.

Standard

Order code		Flange	A	D	L	L2
Magnetic	**Non-magnetic**					
VPZ16BE-XX	**VPZ16BE-XX-NM**	DN16CF	34	16	12.7	0.25
VPZ38BE-XX	**VPZ38BE-XX-NM**	DN35CF	70	32	12.7	0.5
VPZ38LABE-XX	**VPZ38LABE-XX-NM**	DN35CF	70	40	12.7	0.5

Viewports with Flanged Socket

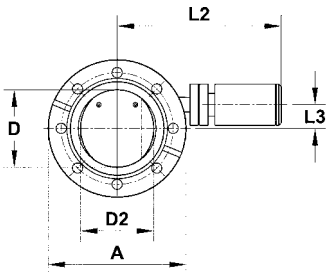
KF, ISO and CF viewports with flanged socket

KF, ISO and CF viewports with flanged socket made of different glass materials are available on request. Please contact your customer advisor or send a request for quotation to: info@vacom.de.

Viewport shutters, manual

Viewport Shutters
Due to different flange standards and tube dimension viewports shutters are available in sizes DN63, DN100 and DN150 also with smaller blades. This option is specified by an “S” at the end of the order code

MD16 Drive
The MD16 MagiDrive serves as drive for all viewport shutters. The basic version of the rotary feedthrough is equipped with an internal friction brake. This enables to pivot and hold the shutter in any position. Other drive options for the rotary feedthrough are shown on page 7-16ff.
These viewport shutters are also appropriate to RHEED applications due to very low magnetic stray fields.



Technical Data

■ Specifications	Viewport shutters serve the protection of the vacuum side of the viewport during coating processes. Four flange dimensions are available.
■ Drive	mechanical rotary feedthrough type MagiDrive MD16
■ Connection	CF flange
■ Bakeable	up to 250 °C

Standard shutter

Order code	Flange	A	D	D2	L	L2	L3
VPS38	DN38CF	70	37	31.8	20.2	116	10
VPS64	DN63CF	114	63.5	57	17.4	135	19.5
VPS100	DN100CF	152	101.6	87	19.8	158	35.5
VPS150	DN150CF	203	152.4	133.2	22.3	173	52.5

Small shutter

Order code	Flange	A	D	D2	L	L2	L3
VPS64S	DN63CF	114	60.3	57	17.4	135	19.5
VPS100S	DN100CF	152	96.8	83.4	19.8	158	35.5
VPS150S	DN150CF	203	147.6	128.5	22.3	173	52.5