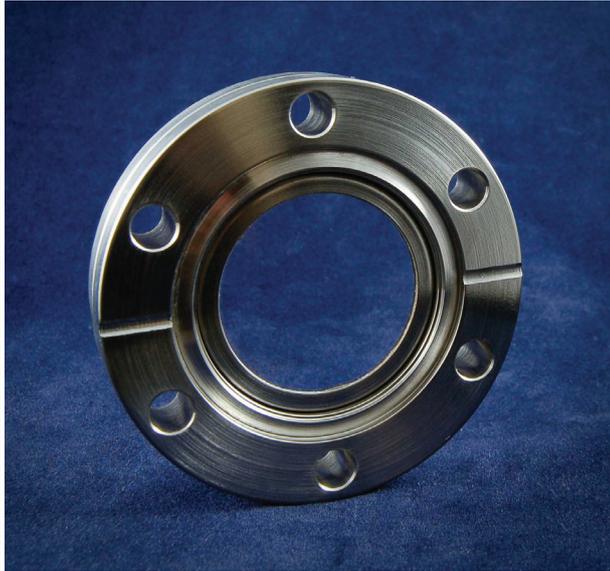


# Kodial Zero Length Viewports with Anti-Reflective Coatings

Kodial Zero Length Viewports with Anti-Reflective Coatings

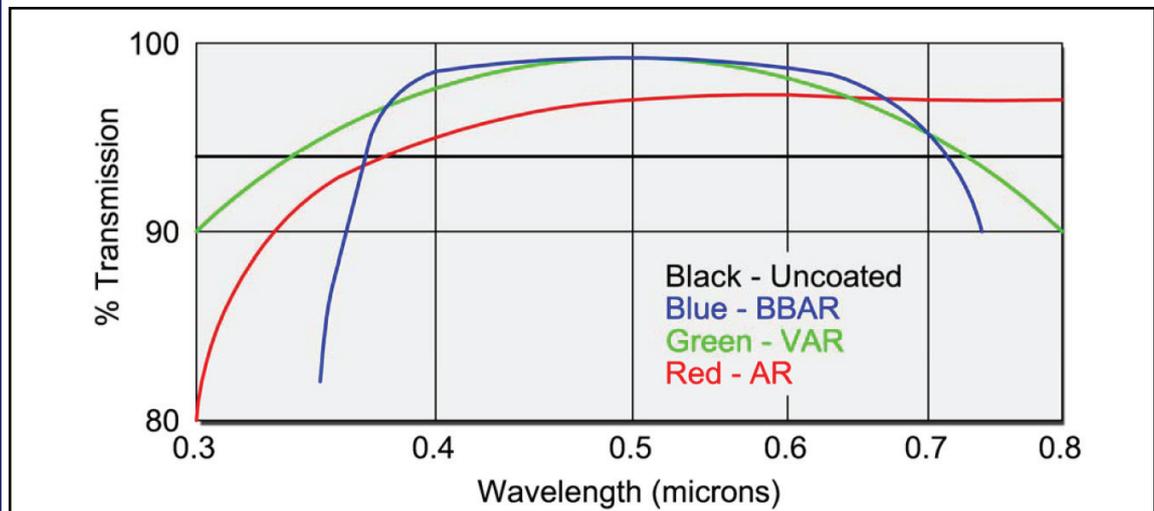


Specification	
Seal Type	Induction
Maximum Temperature	350°C (KF versions 150°C)
Minimum Temperature	minus 20°C
Maximum Rate of Temperature Change	3°C per minute
Leak Rate	<math>1 \times 10^{-10}</math> atm-cc/sec (He)
Pressure Range	1 bar to $1 \times 10^{-11}$ mbar
Coating	Single layer 1 x QWOT 'AR' coating optimised to customer specified wavelength range between 190nm and 1550nm

Torr Scientific Kodial viewports are offered with a single 1 x QWOT MgF2 layer anti-reflective (AR) coating on both sides of the window optimised to a customer specified wavelength range. Please advise the important wavelengths or wavelength range with your enquiry or order. Wavelength ranges between 190nm and 1550nm can be accepted as standard, although coatings for other wavelength ranges can be quoted on request. Viewports with 'V' coatings for a single wavelength applications and four-layer broadband low reflectance 'BBAR' coatings are also offered. Torr Scientific Kodial viewports are offered in CF, ISO and KF flange styles. 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 in to flanges and are helium leak tested and cleaned for ultra high vacuum (UHV) conditions. The CF versions are offered using 304L or 316LN stainless steel flanges. Flanges in 316L stainless steel are used for the high vacuum KF and ISO viewports. The rugged construction of the Kodial viewports allows repeated bake-out with UHV performance, whilst the window offers broadband optical transmission from the visible to near infra-red. Anti-reflective coatings to match customer reflectance requirements are also processed at TSL. Please advise the wavelength or wavelength ranges of your application and a reflectance curve will be prepared. Non-standard viewports can be manufactured on request, including re-entrant style microscope/camera viewports. Annealed copper gaskets and other component accessories are also supplied by TSL.

## Transmission Curve - Kodial

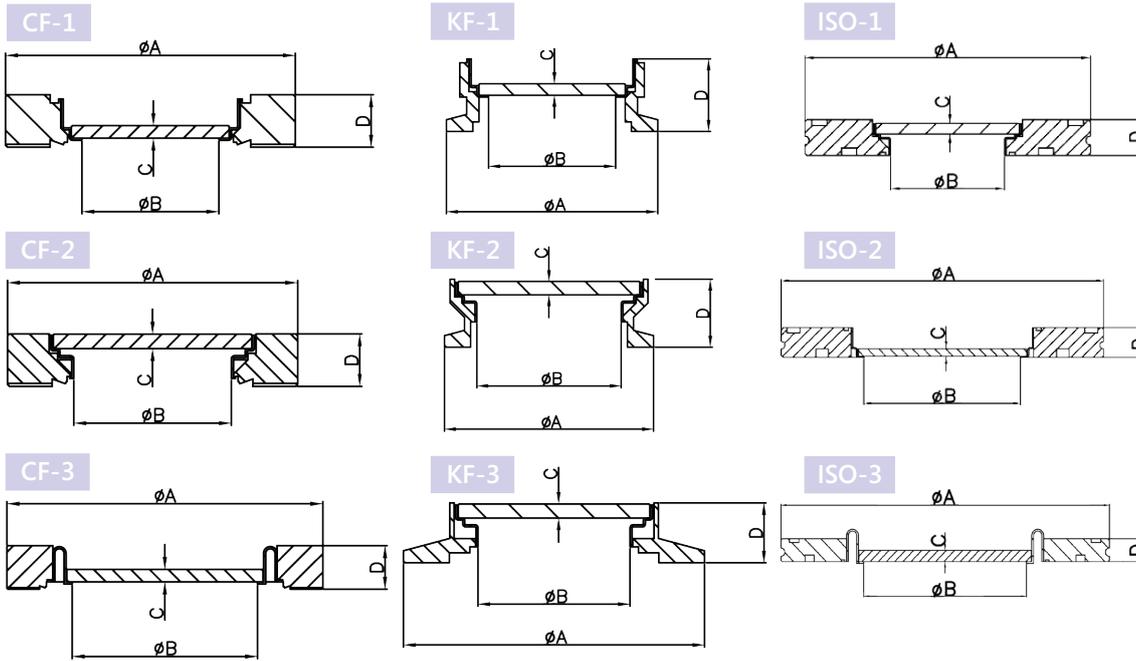
The graph below shows typical before and after transmission effect of 'AR', 'VAR', and BBAR' anti-reflective coatings on Kodial Viewports. Customers should specify wavelength range of application with their enquiry.



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



# Kodial Zero Length Viewports with Anti-Reflective Coatings



Part Number	Flange Type	A	B	C	D	Diagram	Flange Material	Weld Ring Material
VPZ16AR	NW16CF	34	15	1	12.7	CF-1	304L	Kovar
VPZ16AR-LN	NW16CF	34	15	1	12.7	CF-1	316LN	Kovar
KVPZ16AR	KF16	25	15	1	12.7	KF-1	304L	Kovar
KVPZ25AR	KF25	40	20	1.5	18.5	KF-2	304L	Kovar
VPZ38AR	NW35CF	70	32	2.5	12.7	CF-1	304L	Kovar
VPZ38LAAR	NW35CF	70	38*	3	12.7	CF-2	304L	Kovar
VPZ38AR-LN	NW35CF	70	32	2.5	12.7	CF-1	316LN	Kovar
VPZ38LAAR-LN	NW35CF	70	38*	3	12.7	CF-2	316LN	Kovar
KVPZ40/32AR	NW35CF	70	32	2.5	12.7	KF-1	316L	Kovar
KVPZ40AR	KF40	55	38*	3	18.5	KF-3	304L	Kovar
KVPZ50AR	KF50	75	38*	3	15	KF-3	304L	Kovar
VPZ50AR	NW50CF	86	38*	3	16	CF-2	304L	Kovar
ISO63VPZAR	ISO63	95	38*	3	12	ISO-1	304L	Kovar
VPZ64AR	NW63CF	114	63	3	17.4	CF-1	304L	Kovar
VPZ64LAAR	NW63CF	114	65	3.5	17.4	CF-2	304L	Kovar
VPZ64AR-LN	NW63CF	114	63	3	17.4	CF-1	316LN	Kovar
VPZ100AR	NW100CF	152	89	4	19.9	CF-3	304L	Kovar
VPZ100AR-LN	NW100CF	152	89	4	19.9	CF-3	316LN	Kovar
ISO100VPZAR	ISO100	130	63	3	12	ISO-2	304L	Kovar
VPZ150AR	NW150CF	203	136	8	22.3	CF-3	304L	Kovar
VPZ100AR-LN	NW150CF	203	136	8	22.3	CF-3	316LN	Kovar
ISO160VPZAR	ISO160	180	89	4	12	ISO-3	304L	Kovar
VPZ200AR	NW200CF	254	136	8	24.5	CF-3	304L	Kovar

\* Note that the position of the optic in the VPZ38LA design results in the coating being effective over the central >30mm only.

Please advise the wavelength range of application with your enquiry or order. Wavelengths range between 190nm and 1550nm can be accepted as standard, although coatings for other wavelengths can be quoted on request.

Kodial Zero Length Viewports with Anti-Reflective Coatings



# Kodial Zero Length Viewports with Broadband Anti-Reflective Coatings

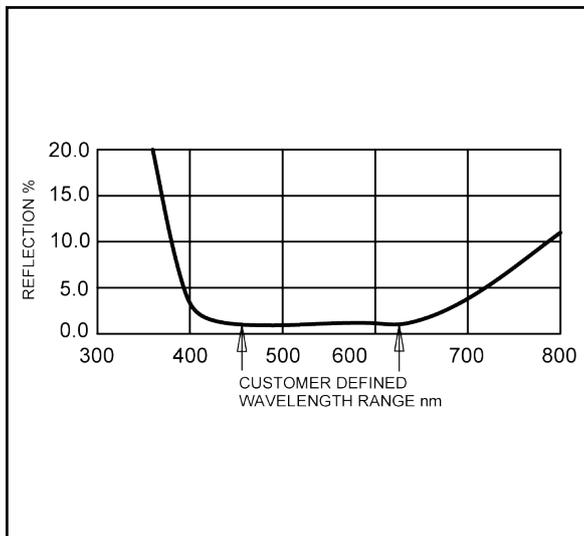
Kodial Viewports with Broadband Anti-Reflective Coatings



Specification	
Seal Type	Induction
Maximum Temperature	350°C (KF versions 150°C)
Minimum Temperature	minus 20°C
Maximum Rate of Temperature Change	3°C per minute
Leak Rate	<1x10 <sup>-10</sup> atm-cc/sec (He)
Pressure Range	1 bar to 1x10 <sup>-11</sup> mbar
Coating	4-layer BBAR coating optimised to customer specified wavelength range between 240nm and 1550nm

Torr Scientific Kodial viewports are offered with a four-layer broadband anti-reflective (BBAR) coating on both sides of the window optimised to a customer specified wavelength range. In many cases, the coating reduces reflection to below 0.5% per face or 1% total at the key wavelengths specified. Please advise the important wavelengths or wavelength range with your enquiry or order. Wavelength ranges between 240nm and 1550nm can be accepted as standard, although coatings for other wavelength ranges can be quoted on request. Viewports with 'V' coatings for a single wavelength for laser applications are also offered. Torr Scientific Kodial viewports are offered in CF, ISO and KF flange styles. 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 in to flanges and are helium leak tested and cleaned for ultra high vacuum (UHV) conditions. The CF versions are offered using 304L or 316LN stainless steel flanges. Flanges in 316L stainless steel are used for the high vacuum KF and ISO viewports. The rugged construction of the Kodial viewports allows repeated bake-out with UHV performance, whilst the window offers broadband optical transmission from the visible to near infra-red. Anti-reflective coatings to match customer reflectance requirements are also processed at TSL. Please advise the wavelength or wavelength ranges of your application and a reflectance curve will be prepared. Non-standard viewports can be manufactured on request, including re-entrant style microscope/camera viewports. Annealed copper gaskets and other component accessories are also supplied by TSL.

## Reflectance Curve



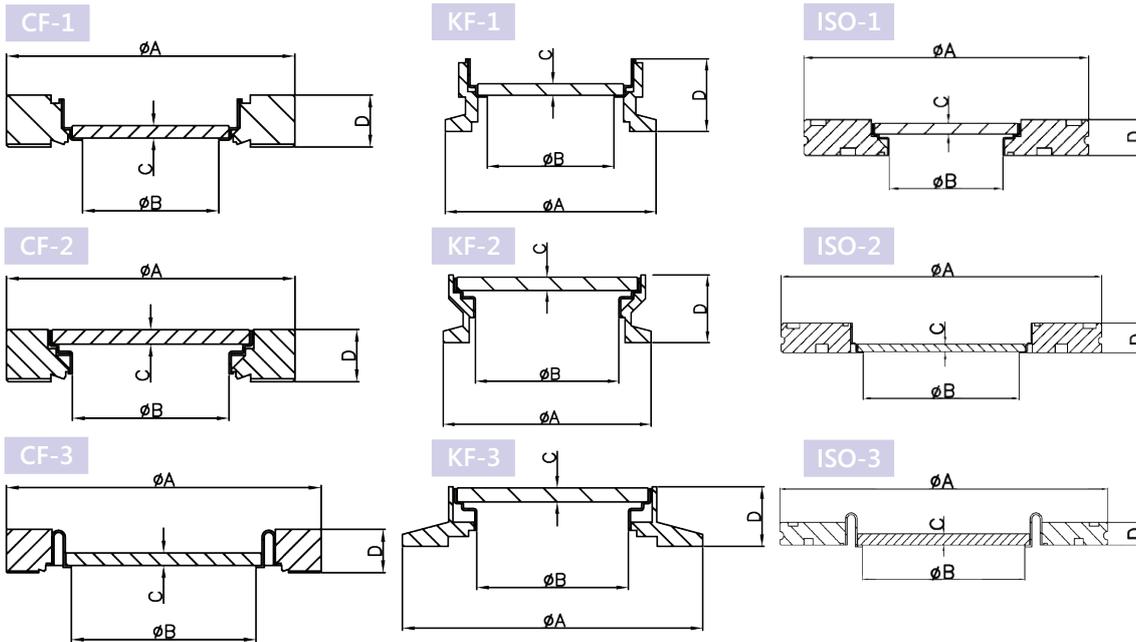
## The TSL UV-Vis Spectrophotometer



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



# Kodial Zero Length Viewports with Broadband Anti-Reflective Coatings



Part Number	Flange Type	A	B	C	D	Diagram	Flange Material	Weld Ring Material
VPZ16BBAR	NW16CF	34	15	1	12.7	CF-1	304L	Kovar
VPZ16BBAR-LN	NW16CF	34	15	1	12.7	CF-1	316LN	Kovar
KVPZ16BBAR	KF16	25	15	1	12.7	KF-1	304L	Kovar
KVPZ25BBAR	KF25	40	20	1.5	18.5	KF-2	304L	Kovar
VPZ38BBAR	NW35CF	70	32	2.5	12.7	CF-1	304L	Kovar
VPZ38LABBAR	NW35CF	70	38*	3	12.7	CF-2	304L	Kovar
VPZ38BBAR-LN	NW35CF	70	32	2.5	12.7	CF-1	316LN	Kovar
VPZ38LABBAR-LN	NW35CF	70	38*	3	12.7	CF-2	316LN	Kovar
KVPZ40/32BBAR	NW35CF	70	32	2.5	12.7	KF-1	316L	Kovar
KVPZ40BBAR	KF40	55	38*	3	18.5	KF-3	304L	Kovar
KVPZ50BBAR	KF50	75	38*	3	15	KF-3	304L	Kovar
VPZ50BBAR	NW50CF	86	38*	3	16	CF-2	304L	Kovar
ISO63VPZBBAR	ISO63	95	38*	3	12	ISO-1	304L	Kovar
VPZ64BBAR	NW63CF	114	63	3	17.4	CF-1	304L	Kovar
VPZ64LABBAR	NW63CF	114	65	3.5	17.4	CF-2	304L	Kovar
VPZ64BBAR-LN	NW63CF	114	63	3	17.4	CF-1	316LN	Kovar
VPZ100BBAR	NW100CF	152	89	4	19.9	CF-3	304L	Kovar
VPZ100BBAR-LN	NW100CF	152	89	4	19.9	CF-3	316LN	Kovar
ISO100VPZBBAR	ISO100	130	63	3	12	ISO-2	304L	Kovar
VPZ150BBAR	NW150CF	203	136	8	22.3	CF-3	304L	Kovar
VPZ150BBAR-LN	NW150CF	203	136	8	22.3	CF-3	316LN	Kovar
ISO160VPZBBAR	ISO160	180	89	4	12	ISO-3	304L	Kovar
VPZ200BBAR	NW200CF	254	136	8	24.5	CF-3	304L	Kovar

\* Note that the position of the optic in the VPZ38LA design results in the coating being effective over the central >30mm only.

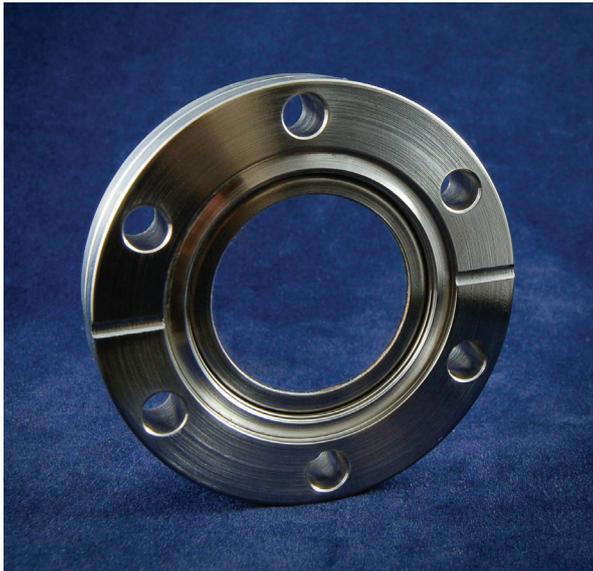
Please advise the wavelength range with your enquiry or order. Wavelengths range between 240nm and 1550nm can be accepted as standard, although coatings for other wavelengths can be quoted on request.

Kodial Viewports  
with Broadband Anti-  
Reflective Coatings



# Kodial Zero Length Viewports with 'VAR' Anti-Reflective Coatings

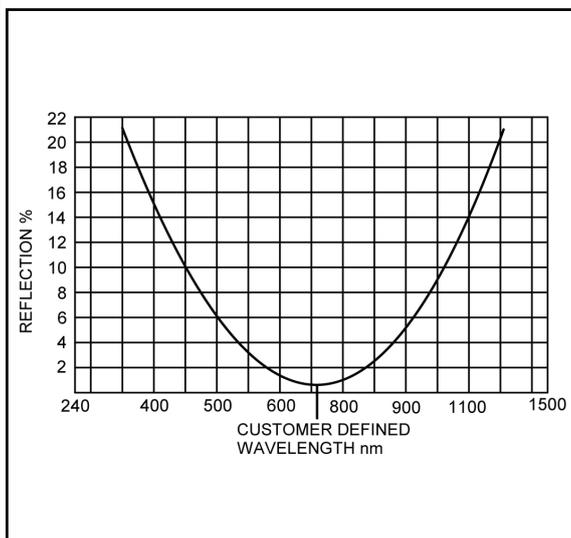
Kodial Viewports with 'VAR' Anti-Reflective Coatings



Specification	
Seal Type	Induction
Maximum Temperature	350°C (KF versions 150°C)
Minimum Temperature	minus 20°C
Maximum Rate of Temperature Change	3°C per minute
Leak Rate	<1x10 <sup>-10</sup> atm-cc/sec (He)
Pressure Range	1 bar to 1x10 <sup>-11</sup> mbar
Coating	2-layer 'VAR' coating optimised to customer specified wavelength between 240nm and 1550nm
Reflectance	< 0.5% per face 1% total at the specified wavelength

Torr Scientific Kodial viewports are offered with a two-layer 'VAR' anti-reflective coating on both sides of the window optimised to a customer specified wavelength. The coating reduces reflection to below 0.5% per face or 1% total at the wavelength specified. Please advise the wavelength with your enquiry or order. Wavelengths between 240nm and 1550nm can be accepted as standard, although coatings for other wavelengths can be quoted on request. Viewports with coatings for a wavelength range can also be offered. Torr Scientific Kodial viewports are offered in CF, ISO and KF flange styles. 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 in to flanges and are helium leak tested and cleaned for ultra high vacuum (UHV) conditions. The CF versions are offered using 304L or 316LN stainless steel flanges. Flanges in 316L stainless steel are used for the high vacuum KF and ISO viewports. The rugged construction of the Kodial viewports allows repeated bake-out with UHV performance, whilst the window offers broadband optical transmission from the visible to near infra-red. Anti-reflective coatings to match customer reflectance requirements are also processed at TSL. Please advise the wavelength or wavelength ranges of your application and a reflectance curve will be prepared. Non-standard viewports can be manufactured on request, including re-entrant style microscope/camera viewports. Annealed copper gaskets and other component accessories are also supplied by TSL.

## Reflectance Curve



## The TSL UV-Vis Spectrophotometer



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

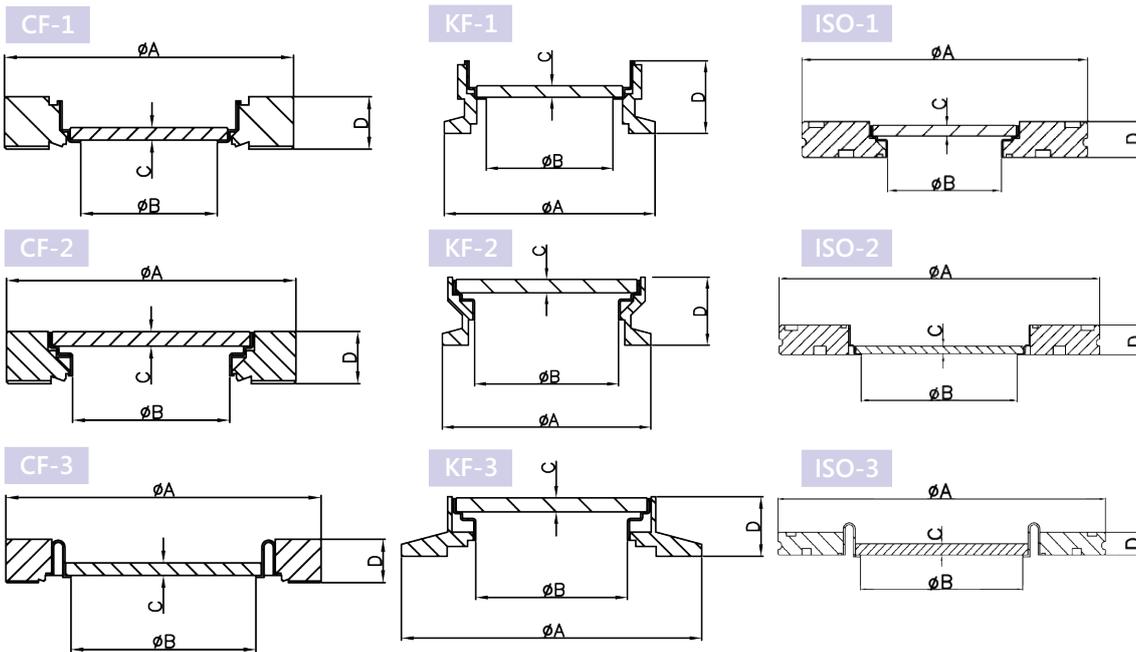


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# Kodial Zero Length Viewports with 'VAR' Anti-Reflective Coatings



Part Number	Flange Type	A	B	C	D	Diagram	Flange Material	Weld Ring Material
VPZ16VAR	NW16CF	34	15	1	12.7	CF-1	304L	Kovar
VPZ16VAR-LN	NW16CF	34	15	1	12.7	CF-1	316LN	Kovar
KVPZ16VAR	KF16	25	15	1	12.7	KF-1	304L	Kovar
KVPZ25VAR	KF25	40	20	1.5	18.5	KF-2	304L	Kovar
VPZ38VAR	NW35CF	70	32	2.5	12.7	CF-1	304L	Kovar
VPZ38LAVAR	NW35CF	70	38*	3	12.7	CF-2	304L	Kovar
VPZ38VAR-LN	NW35CF	70	32	2.5	12.7	CF-1	316LN	Kovar
VPZ38LAVAR-LN	NW35CF	70	38*	3	12.7	CF-2	316LN	Kovar
KVPZ40/32VAR	NW35CF	70	32	2.5	12.7	KF-1	316L	Kovar
KVPZ40VAR	KF40	55	38*	3	18.5	KF-3	304L	Kovar
KVPZ50VAR	KF50	75	38*	3	15	KF-3	304L	Kovar
VPZ50VAR	NW50CF	86	38*	3	16	CF-2	304L	Kovar
ISO63VPZVAR	ISO63	95	38*	3	12	ISO-1	304L	Kovar
VPZ64VAR	NW63CF	114	63	3	17.4	CF-1	304L	Kovar
VPZ64LAVAR	NW63CF	114	65	3.5	17.4	CF-2	304L	Kovar
VPZ64VAR-LN	NW63CF	114	63	3	17.4	CF-1	316LN	Kovar
VPZ100VAR	NW100CF	152	89	4	19.9	CF-3	304L	Kovar
VPZ100VAR-LN	NW100CF	152	89	4	19.9	CF-3	316LN	Kovar
ISO100VPZVAR	ISO100	130	63	3	12	ISO-2	304L	Kovar
VPZ150VAR	NW150CF	203	136	8	22.3	CF-3	304L	Kovar
VPZ150VAR-LN	NW150CF	203	136	8	22.3	CF-3	316LN	Kovar
ISO160VPZVAR	ISO160	180	89	4	12	ISO-3	304L	Kovar
VPZ200VAR	NW200CF	254	136	8	24.5	CF-3	304L	Kovar

\* Note that the position of the optic in the VPZ38LA design results in the coating being effective over the central >30mm only.  
Please advise the wavelength with your enquiry or order. Wavelengths between 240nm and 1550nm can be accepted as standard, although coatings for other wavelengths can be quoted on request.

Kodial Viewports with 'VAR' Anti-Reflective Coatings