

Viewports, Shutters & Glass Adapters

Section Eight

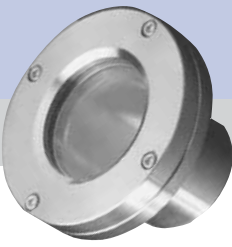


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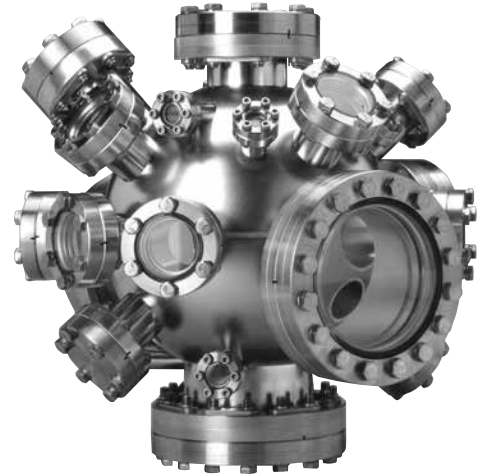
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Viewports & Shutters

General Information



Nor-Cal Products offers a complete line of viewports for vacuum chambers with NW, ISO and CF flanges. CF flanged viewports are available with fully annealed 7056 glass or fused silica. Weld stub viewports are available for welding onto new or existing chambers. Special materials and coatings, such as sapphire and anti-reflective (AR) coating, are available on request. Glass provides a large distortion free viewing area at low cost. Quartz and fused silica provide superior ultraviolet radiation transmission and resistance to thermal shock.

Nor-Cal manufactures glass adapters in 7740 Pyrex and 7052 glass. These adapters are useful for mounting glass accessories to metal high vacuum systems, or to attach flange mounted components to glass systems. Glass adapters are available with NW, CF, and ISO flanges as standards.

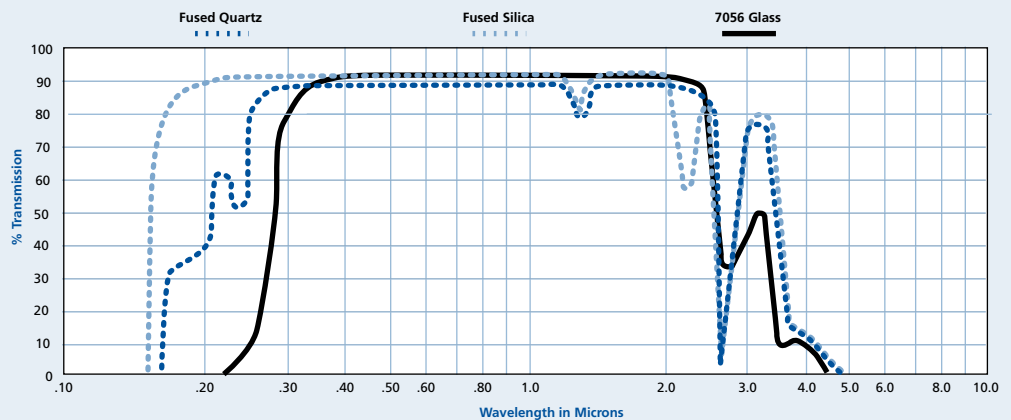
New Products



Viewport Shutters

These shutters mount behind a viewport to prevent deposition process build-up on the viewports. We now offer CF shutters in 4 sizes for mounting to 2³/₄, 4¹/₂, 6 and 8 inch (69.85, 114.3, 152.4 and 203.2mm) CF flanged ports. An integrated PRM-133 rotary motion feedthrough provides smooth actuation and a positive locking screw.

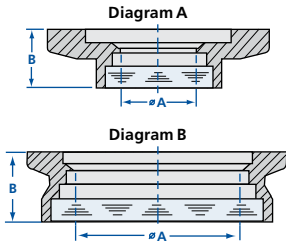
Viewport Optical Transmission Curves



All dimensions are in inches (mm) & weights are in pounds (kg), unless otherwise noted.

Viewports & Shutters

Viewports & Weld Stubs



NW Viewports

7056 glass NW viewports in a one-piece assembly. This viewport replaces a blank off cap and uses a standard NW centering ring assembly and clamp for sealing.

MODEL NUMBER	DIAGRAM	FLANGE TYPE	VIEW MATERIAL	VIEW Ø A	B
VP-NW-16	A	NW-16	7056 Glass	0.62 (15.75)	0.385 (9.78)
VP-NW-25	A	NW-25	7056 Glass	0.62 (15.75)	0.385 (9.78)
VP-NW-40	B	NW-40	7056 Glass	1.51 (38.35)	0.554 (14.07)
VP-NW-50	B	NW-50	7056 Glass	1.51 (38.35)	0.554 (14.07)

SPECIFICATIONS

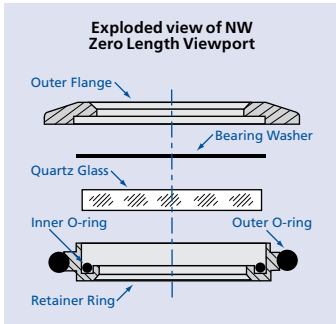
Materials
 Flanges: 304 stainless steel
 Viewports: Glass or fused quartz
 Seal: Viton

Vacuum range: $\geq 1 \times 10^{-9}$ mbar - High vacuum

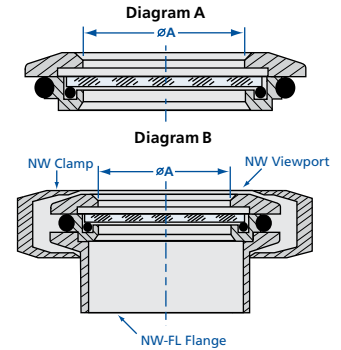
Temperature range: -20°C to 200°C

NW Zero Length Viewports

Nor-Cal's zero length viewports have an innovative design which places the viewing glass inside the centering ring. The clear, polished quartz can be removed for cleaning or replacement. Zero length viewports are available for NW-40 and NW-50 flange sizes.

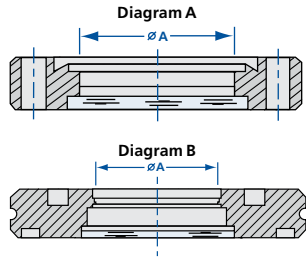


MODEL NUMBER	DIAGRAM	FLANGE TYPE	VIEW MATERIALS	VIEW Ø A
ZV-NW-40	A	NW-40	Fused quartz	1.26 (32.00)
ZV-NW-50	A	NW-50	Fused quartz	1.63 (41.40)
ZV-NW-40A	B	NW-40	Fused quartz	1.26 (32.00)
ZV-NW-50A	B	NW-50	Fused quartz	1.63 (41.40)



ISO & CF Zero Length Viewports

ISO and CF viewports are one-piece assemblies (See diagram to the left). For clamps and fastening hardware, please refer to the appropriate flange section.



MODEL NUMBER	DIAGRAM	FLANGE TYPE	VIEW MATERIALS	VIEW Ø A
ZV-075	A	1.33 CF	7056 Glass	0.63 (16.00)
ZV-100	A	2.12 CF	7056 Glass	0.63 (16.00)
ZV-150	A	2.75 CF	7056 Glass	1.49 (37.85)
ZVQ-150	A	2.75 CF	Fused silica	1.40 (35.56)
ZV-200	A	3.38 CF	7056 Glass	1.49 (37.85)
ZVQ-200	A	3.38 CF	Fused silica	1.40 (35.56)
ZV-250	A	4.50 CF	7056 Glass	2.66 (67.56)
ZVQ-250	A	4.50 CF	Fused silica	2.69 (68.33)
ZV-300	A	4.62 CF	7056 Glass	2.66 (67.56)
ZVQ-300	A	4.62 CF	Fused silica	2.69 (68.33)
ZV-400	A	6.00 CF	7056 Glass	3.97 (100.84)
ZVQ-400	A	6.00 CF	Fused silica	3.88 (98.55)
ZV-500	A	6.75 CF	7056 Glass	3.97 (100.84)
ZVQ-500	A	6.75 CF	Fused silica	3.88 (98.55)
ZV-600	A	8.00 CF	7056 Glass	5.60 (142.24)
ZVQ-600	A	8.00 CF	Fused silica	5.37 (136.40)
ZV-800	A	10.00 CF	7056 Glass	5.60 (142.24)
ZVQ-800	A	10.00 CF	Fused silica	7.78 (197.61)
ZV-ISO-63-OF	B	ISO-63	7056 Glass	1.49 (37.85)
ZV-ISO-80-OF	B	ISO-80	7056 Glass	1.49 (37.85)
ZV-ISO-100-OF	B	ISO-100	7056 Glass	2.66 (67.56)
ZV-ISO-160-OF	B	ISO-160	7056 Glass	3.97 (100.84)
ZV-ISO-200-OF	B	ISO-200	7056 Glass	5.60 (142.24)

SPECIFICATIONS

Materials
 Flanges: 304 stainless steel
 Tubes: 304 stainless steel
 Viewports: Glass, fused silica, or fused quartz
 Weld stub seals: Viton

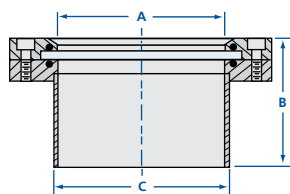
Vacuum range
 Weld stubs: $\geq 1 \times 10^{-9}$ mbar - High vacuum
 ISO flange: $\geq 1 \times 10^{-9}$ mbar - High vacuum
 CF flange: $\geq 1 \times 10^{-11}$ mbar - UHV

Temperature range
 Weld stubs: -20°C to 200°C
 ISO flange: -20°C to 200°C
 CF flange, Glass: -20°C to 400°C
 CF flange, Silica: -20°C to 200°C

All dimensions are in inches (mm) & weights are in pounds (kg), unless otherwise noted.

Viewport Weld Stubs

Weld stub viewports are provided with a tube for welding onto an existing chamber.

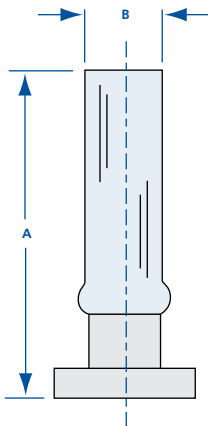
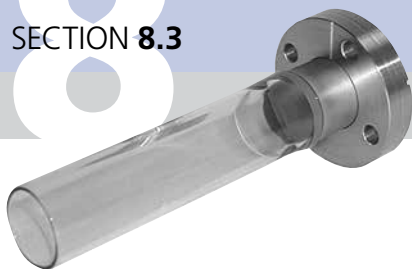


MODEL NUMBER	FLANGE OD	VIEW MATERIAL	VIEW Ø A	B	C
VP-250	4.47 (113.54)	Borosilicate glass	2.37 (60.2)	2.88 (73.15)	2.50 (63.50)
VPQ-250	4.47 (113.54)	Fused quartz	2.37 (60.2)	2.88 (73.15)	2.50 (63.50)
VP-400	5.97 (151.64)	Borosilicate glass	3.83 (97.28)	2.88 (73.15)	4.00 (101.60)
VPQ-400	5.97 (151.64)	Fused quartz	3.83 (97.28)	2.88 (73.15)	4.00 (101.60)
VP-600	7.97 (202.44)	Borosilicate glass	5.83 (148.08)	2.88 (73.15)	6.00 (152.40)
VPQ-600	7.97 (202.44)	Fused quartz	5.83 (148.08)	2.88 (73.15)	6.00 (152.40)



Viewports & Shutters

Glass Adapters & Viewport Shutters



NW, ISO & CF Glass Adapters

Nor-Cal manufactures glass adapters in 7740 Pyrex and 7052 glass. These adapters are useful for mounting glass accessories to metal high vacuum systems, or to attach flange mounted components to glass systems. These adapters are available standard with NW, CF, and ISO flanges.

MODEL NUMBER	FLANGE TYPE	GLASS/SLEEVE MATERIALS	A	B
1GA-NW-038P	NW-10	7740 Pyrex/stainless steel	4.90 (124.46)	0.38 (9.65)
1GA-NW-075P	NW-16	7740 Pyrex/stainless steel	4.90 (124.46)	0.75 (19.05)
1GA-NW-100P	NW-25	7740 Pyrex/stainless steel	4.90 (124.46)	1.00 (25.40)
1GA-NW-150P	NW-40	7740 Pyrex/stainless steel	4.90 (124.46)	1.50 (38.10)
1GA-NW-200P	NW-50	7740 Pyrex/stainless steel	5.40 (137.16)	2.00 (50.80)
1GA-ISO-63-OF-K	ISO-63	7052 glass/Kovar	7.36 (186.94)	2.50 (63.50)
1GA-ISO-63-OF-P	ISO-63	7740 Pyrex/stainless steel	5.50 (139.70)	2.50 (63.50)
1GA-ISO-80-OF-K	ISO-80	7052 glass/Kovar	7.36 (186.94)	3.00 (76.20)
1GA-ISO-80-OF-P	ISO-80	7740 Pyrex/stainless steel	6.50 (165.10)	3.00 (76.20)
1GA-ISO-100-OF-K	ISO-100	7052 glass/Kovar	10.25 (260.35)	4.00 (101.60)
1GA-ISO-100-OF-P	ISO-100	7740 Pyrex/stainless steel	6.50 (165.10)	4.00 (101.60)
1GA-ISO-160-OF-K	ISO-160	7052 glass/Kovar	10.88 (276.35)	6.00 (152.40)
1GA-ISO-160-OF-P	ISO-160	7740 Pyrex/stainless steel	8.63 (219.20)	6.00 (152.40)
1GA-075K	1.33 CF	7052 glass/Kovar	5.43 (137.92)	0.75 (19.05)
1GA-075P	1.33 CF	7740 Pyrex/stainless steel	4.93 (125.22)	0.75 (19.05)
1GA-100K	2.12 CF	7052 glass/Kovar	5.42 (137.67)	1.00 (25.40)
1GA-100P	2.12 CF	7740 Pyrex/stainless steel	4.92 (124.97)	1.00 (25.40)
1GA-150K	2.75 CF	7052 glass/Kovar	5.46 (138.68)	1.50 (38.10)
1GA-150P	2.75 CF	7740 Pyrex/stainless steel	4.96 (125.98)	1.50 (38.10)
1GA-200K	3.38 CF	7052 glass/Kovar	5.98 (151.89)	2.00 (50.80)
1GA-200P	3.38 CF	7740 Pyrex/stainless steel	5.48 (139.19)	2.00 (50.80)
1GA-250K	4.50 CF	7052 glass/Kovar	7.76 (197.10)	2.50 (63.50)
1GA-250P	4.50 CF	7740 Pyrex/stainless steel	5.63 (143.00)	2.50 (63.50)
1GA-300K	4.62 CF	7052 glass/Kovar	7.66 (194.56)	3.00 (76.20)
1GA-300P	4.62 CF	7740 Pyrex/stainless steel	6.53 (165.86)	3.00 (76.20)
1GA-400K	6.00 CF	7052 glass/Kovar	10.44 (265.18)	4.00 (101.60)
1GA-400P	6.00 CF	7740 Pyrex/stainless steel	6.69 (169.93)	4.00 (101.60)
1GA-500K	6.75 CF	7052 glass/Kovar	10.96 (278.38)	5.00 (127.00)
1GA-500P	6.75 CF	7740 Pyrex/stainless steel	8.71 (221.23)	5.00 (127.00)
1GA-600K	8.00 CF	7052 glass/Kovar	11.00 (279.40)	6.00 (152.40)
1GA-600P	8.00 CF	7740 Pyrex/stainless steel	8.75 (222.25)	6.00 (152.40)

SPECIFICATIONS

Materials

Flange: 304 stainless steel
Glass: 7052 glass or 7740 Pyrex
Sleeve: Kovar or 304 stainless steel

Vacuum range

Elastomer seal: $\geq 1 \times 10^{-8}$ mbar - High vacuum
Metal seal: $\geq 1 \times 10^{-10}$ mbar - UHV

Temperature range

Elastomer seal: -20°C to 200°C
Metal seal: -20°C to 400°C

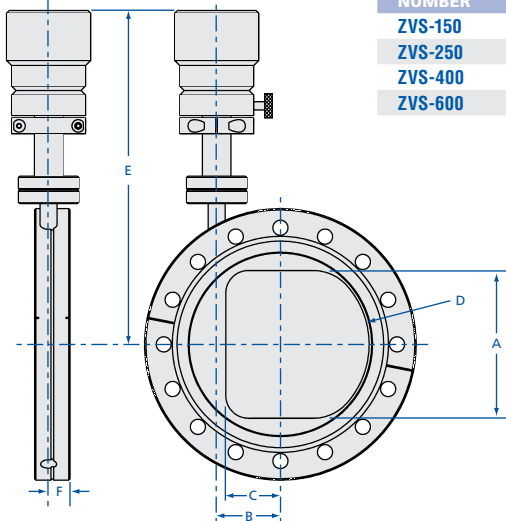
SPECIFICATIONS

Materials

Flanges: 304 stainless steel
Flange type: 2 3/4 to 8 inch (69.85 to 203.2mm) CF, clearance bolt holes
Actuation: PRM-133 rotary feedthrough

Temperature range: -20°C to 150°C

Vacuum range: $\geq 10^{-10}$ mbar - UHV



Viewport Shutters

Nor-Cal Products manufactures shutters for viewport shielding. These shutters are mounted behind a viewport to prevent build-up of deposition materials on viewports while in the closed position. They use a single plate shutter with a 90° opening rotation. Nor-Cal's design completely shields the viewing glass when the shutter is in the closed position. An integrated PRM-133 rotary motion feedthrough provides smooth actuation and a positive locking screw. Please call for custom actuation options, such as motor drives or special flanges.

MODEL NUMBER	FLANGE TYPE	FITS TUBE DIAMETER	A	B	C	D	E	F
ZVS-150	2.75 CF	1.510 (38.35)	1.12 (28.45)	0.57 (14.48)	0.42 (10.67)	0.70 (17.78)	5.99 (152.15)	0.44 (11.18)
ZVS-250	4.50 CF	2.510 (63.75)	2.00 (50.80)	0.85 (21.59)	0.65 (16.51)	1.18 (29.97)	6.92 (175.77)	0.34 (8.64)
ZVS-400	6.00 CF	4.010 (101.85)	3.25 (82.55)	1.40 (35.56)	1.20 (30.48)	1.90 (48.26)	7.34 (186.44)	0.47 (11.94)
ZVS-600	8.00 CF	6.020 (152.91)	5.00 (127.00)	2.06 (52.32)	1.75 (44.45)	2.90 (73.66)	8.49 (215.65)	0.50 (12.70)

