










2010
Product Catalog

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VIEWPORTS

Viewports are plane parallel windows hermetically-sealed to stainless steel mounts such as: Weld adapter (-W), Quick Flange (-QF) or Conflat Flange (-CF). These assemblies are specifically designed to conveniently port the transmission of electromagnetic radiation into and/or out of sealed systems. Several standard material options are offered covering various common transmission ranges and applications. Optical coatings are available to enhance and optimize viewport transmission. Narrow and broad band anti-reflective coatings are offered standard. All viewports are UHV compatible.

Other mounting options as well as non-standard materials, coatings and optical features may be customized to meet specific applications.

Sapphire and Fused Silica

MPF manufactures Sapphire and Fused Silica viewports using proprietary vacuum brazing and welding techniques. Sapphire viewports are available with view diameters up to 3 inches, and are bakeable to 450°C. Single crystal, sapphire windows, with either 0° or 90° orientation, offer excellent transmission from 250 nm to 4 microns.

Fused Silica viewport designs are available with diameters up to 8 inches and include zero length designs for low profile applications. These are all bakeable to 200°C. Several standard grades of Fused Silica windows are offered having excellent transmission from 193nm to 2 microns.

Coated Fused Silica

MPF offers a full line of tailored laser viewports designed specifically for a variety of popular high-power lasers. These viewports utilize optimum window and anti-reflective coating specifications to maximize performance at specific wavelengths. Supported wavelengths and laser applications are: 193nm-ArF Excimer, 248nm-KrF Excimer, 780nm-Diode and 1064nm YAG.

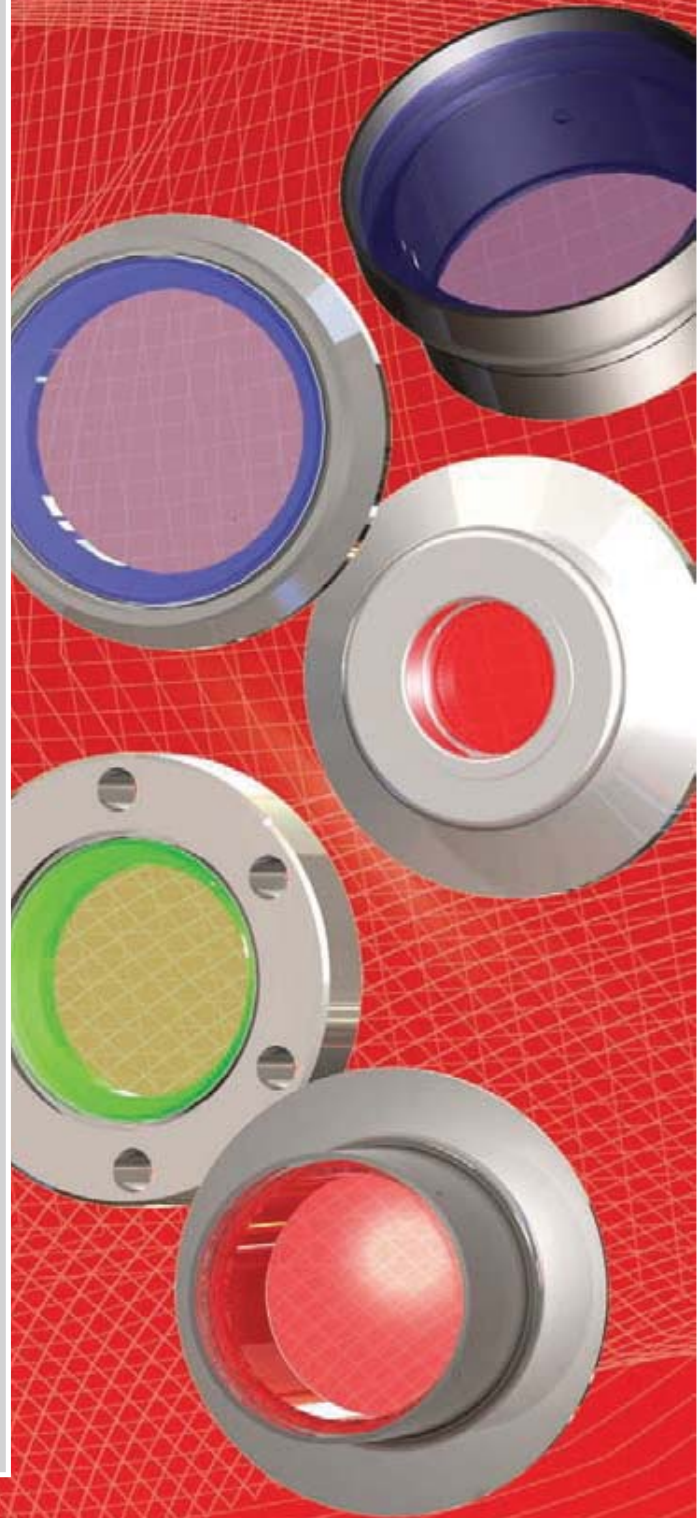
Extended Range Vacuum Optics

These ultra-high vacuum (UHV) viewports employ window materials such as Zinc Selenide, Magnesium Fluoride and Calcium Fluoride. All-metal-sealed, extended-range optics are available in 1 inch and 2 inch view diameters with a combined transmission range of 120nm to 20 microns.

Coatings which enhance the transmission performance of many of these viewports are offered as standard options. Many non-standard materials, coatings and optical specifications may be reviewed and quoted to meet custom application requirements.

Specialized Optics

See page 15 for more information on differentially pumped, non-magnetic, and re-entrant viewports.



VIEWPORTS

Table of Contents



VIEWPORT TYPE	NOMINAL VIEW DIAMETER	TRANSMISSION RANGE	THERMAL RATING	SECTION PAGES
Sapphire	.38" to 3"	0.17 microns to 5 microns	Window: -100 to 450°C	1.1 4 - 7
Fused Silica	.75" to 8"	0.18 microns to 3.5 microns	Window: -100 to 200°C	1.2 8 - 11
BBAR Coated Fused Silica	1.5" to 2.5"	225nm to 450nm 425nm to 760nm 550nm to 1100nm	Window: -100 to 200°C	1.3 12
Laser Optics	1.5" to 2.5"	193, 248, 780 and 1064 nm	Window: -100 to 200°C	1.4 13
Extended Range Optics	1.0" to 2.0"	0.13 microns to 18 microns	Window: -100 to 200°C	1.5 14
Specialized Optics	1.0" to 2.5"	See pages 16-18	See pages 16-18	1.6 15 - 18

MPF Custom Optics Capabilities

Beyond its' extensive offering of standard optical products, MPF has custom design and manufacturing expertise and is capable of manufacturing hermetically-sealed, opto-mechanical assemblies that meet most combinations of customer specified form, fit and function. Non-magnetic, RoHS compliant, elevated pressure and temperature options are available for all window materials. Mounting size, design, and construction material as well as view diameter and location may be customer specified. Rigorous dimensional tolerances are available for all optical designs.

MPF also offers custom coating capabilities including single band, multi-band, broadband and specialty coatings on various materials. A design library of field-tested and proven sealed optical assemblies exists for an extensive list of optical materials (including many fluorides, oxides and semiconductor materials – both with and without optical coatings).

The optical finish (surface polish, flatness, parallelism, clear aperture, wedge angle, focal length, and thickness) may also be tailored to specific optical needs.



VIEWPORTS

Sapphire

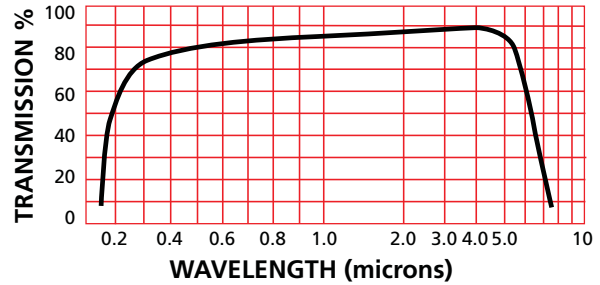
UV SAPPHIRE

Leak Rate: <math><2 \times 10^{-10}</math> atm cc/sec He
 Parallelism: <math><3</math> Arc Minutes
 Flange Material: 304/316 Stn. Stl.
 Surface Finish: 50/20
 Thermal Range: -100°C to 450°C
 Material: Sapphire
 UV Transmission: 50% @ 250nm (external)
 Orientation: 0-90°
 Pressure: Contact MPF Engineering

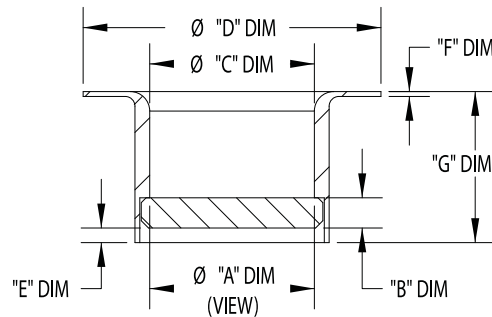
Operating Conditions

The thermal ratings specified are safe operating limits determined by various factors including material properties, mechanical design, and the intended operating environment. Temperature ratings for various mounting options may reduce the operating range of a window assembly. All assemblies have a maximum thermal gradient of 25°C per minute and may be damaged if this limit is exceeded.

SAPPHIRE (UV GRADE)

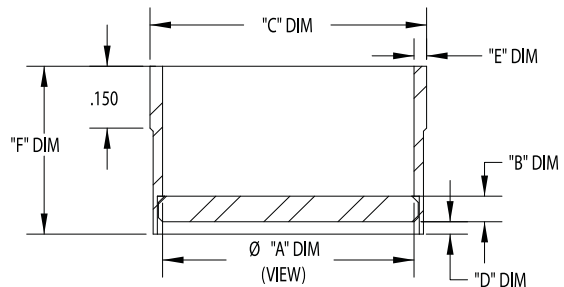


WELDABLE



SLEEVE	Ø "A" DIM (VIEW)	B	C	D	E	F	G	PART #
Kovar	.34	.062	.38	.615	.030	.010	.31	A0711-1-W
Kovar	.46	.062	.51	.740	.030	.010	.31	A0711-2-W

WELDABLE



SLEEVE	Ø "A" DIM (VIEW)	B	C	D	E	F	PART #
Kovar	.59	.062	.66	.030	.030	.43	A0629-1-W

VIEWPORTS

Sapphire



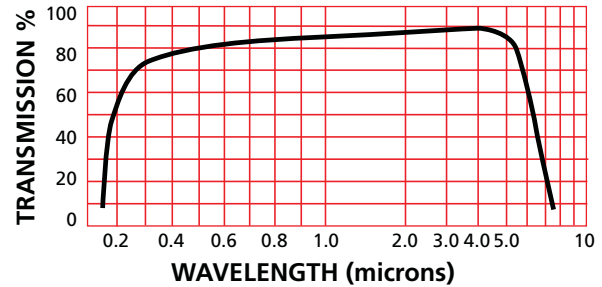
UV SAPPHIRE

Leak Rate: <math><2 \times 10^{-10}</math> atm cc/sec He
 Parallelism: <math><3</math> Arc Minutes
 Flange Material: 304/316 Stn. Stl.
 Surface Finish: 50/20
 Thermal Range: -100°C to 450°C
 Material: Sapphire
 UV Transmission: 50% @ 250nm (external)
 Orientation: 0-90°
 Pressure: Contact MPF Engineering

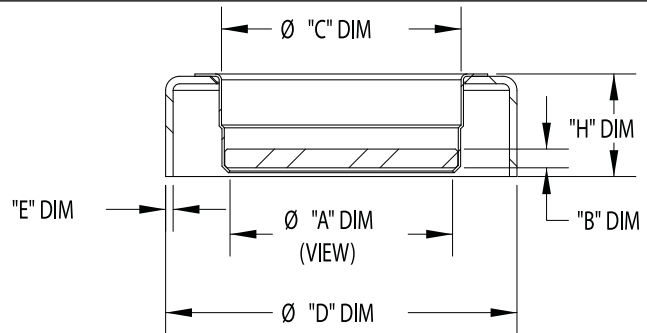
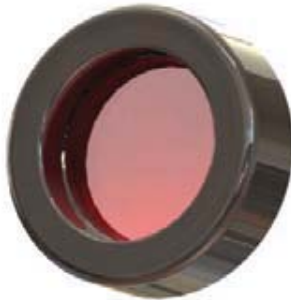
Operating Conditions

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SAPPHIRE (UV GRADE)

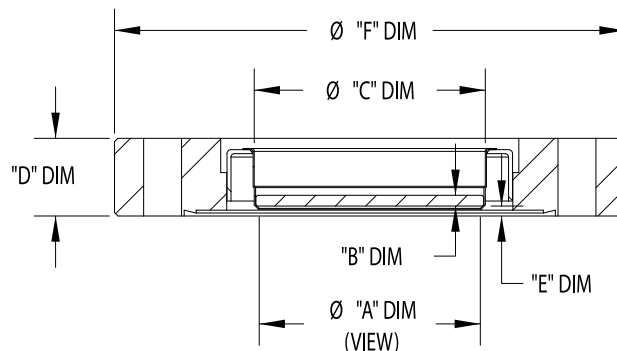


WELDABLE



ADAPTER	Ø "A" DIM (VIEW)	B	C	D	E	H	PART #
STN. STL.	.69	.080	.77	1.500	.030	.44	A0633-1-W
STN. STL.	.94	.080	1.02	1.500	.030	.44	A0633-2-W
STN. STL.	1.44	.080	1.52	2.500	.030	.49	A0633-3-W
STN. STL.	1.94	.094	2.02	2.500	.030	.54	A0633-4-W
STN. STL.	2.95	.125	3.02	3.500	.030	.55	A1679-1-W

CONFLAT FLANGE



Ø "A" DIM (VIEW)	B	C	D	E	F	PART #
.46	.062	.510	.285	.080	1.33	A1858-1-CF
.59	.062	.600	.500	.100	1.33	A0808-1-CF
.69	.080	.770	.500	.080	2.75	A0810-1-CF
.94	.080	1.02	.500	.080	2.75	A0810-2-CF
1.44	.080	1.52	.500	.13	2.75	A6944-1-CF
1.44	.080	1.52	.680	.13	4.50	A0810-3-CF
1.94	.094	2.02	.680	.10	4.50	A0810-4-CF



VIEWPORTS

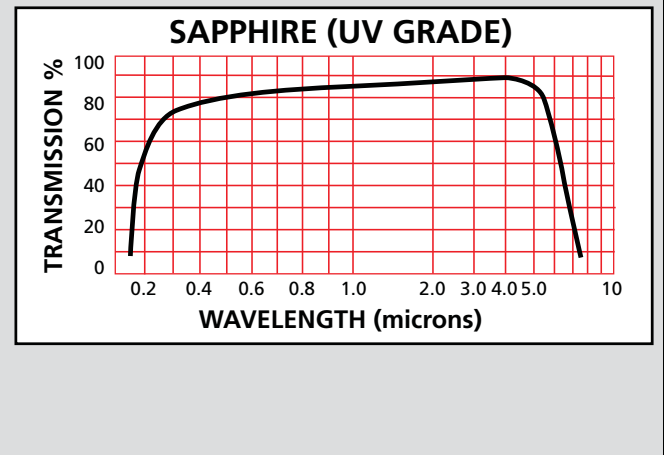
Sapphire

UV SAPPHIRE

Leak Rate: <math> < 2 \times 10^{-10}</math> atm cc/sec He
 Parallelism: <math> < 3</math> Arc Minutes
 Flange Material: 304/316 Stn. Stl.
 Surface Finish: 50/20
 Thermal Range: -100°C to 450°C
 Material: Sapphire
 UV Transmission: 50% @ 250nm (external)
 Orientation: 0-90°
 Pressure: Contact MPF Engineering

Operating Conditions

The thermal ratings specified are safe operating limits determined by various factors including material properties, mechanical design, and the intended operating environment. Temperature ratings for various mounting options may reduce the operating range of a window assembly. All assemblies have a maximum thermal gradient of 25°C per minute and may be damaged if this limit is exceeded.



QUICK FLANGE

FIGURE 1

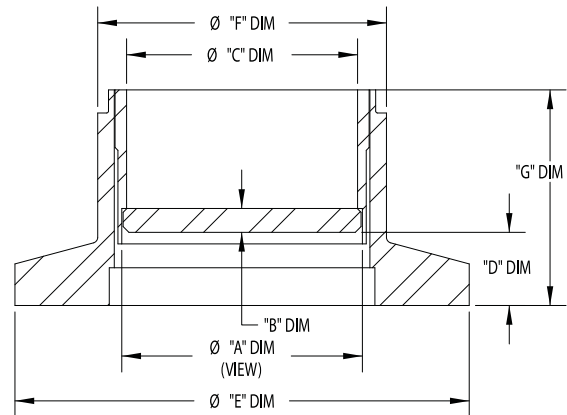
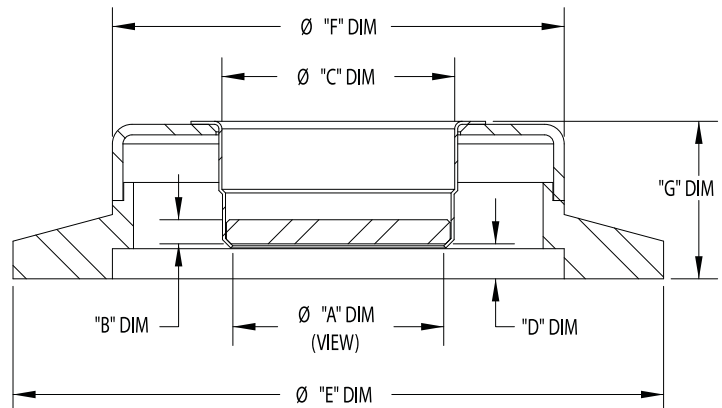
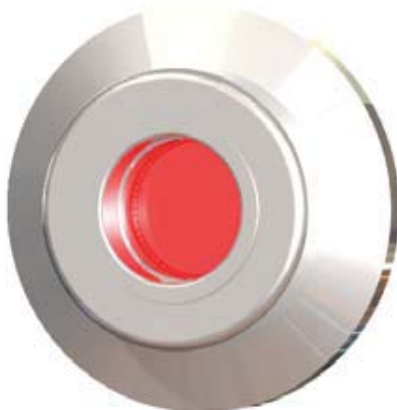


FIGURE 2



GRADE	FIG NO.	Ø "A" DIM (VIEW)	B	C	D	E	F	G	PART #
UV	1	.59	.062	.600	.13	1.18	.750	.56	A0813-1-QF
UV	2	.69	.080	.770	.13	2.16	1.50	.52	A0814-1-QF
UV	2	.94	.080	1.02	.13	2.16	1.50	.52	A0814-2-QF
UV	2	.94	.080	1.02	.13	2.95	2.00	.52	A1641-1-QF

VIEWPORTS

Sapphire



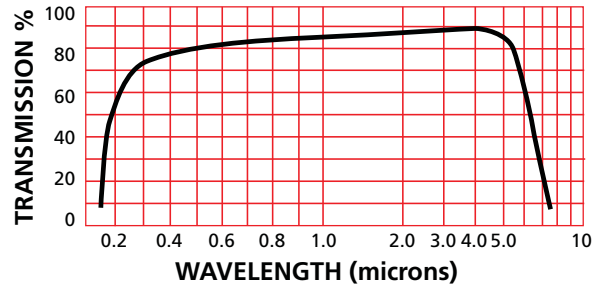
DUV SAPPHIRE

Leak Rate: <math> < 2 \times 10^{-10}</math> atm cc/sec He
 Parallelism: <math> < 3</math> Arc Minutes
 Flange Material: 304/316 Stn. Stl.
 Surface Finish: 20/10
 Thermal Range: -100°C to 450°C
 Material: Sapphire
 UV Transmission: 70% @ 250nm (external)
 Orientation: 0°
 Pressure: Contact MPF Engineering

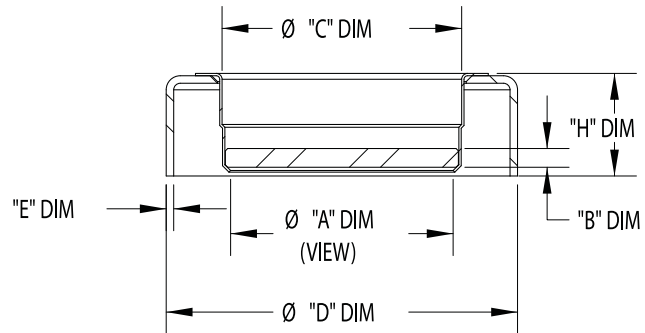
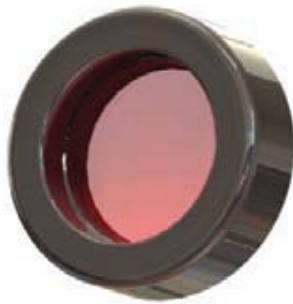
Operating Conditions

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SAPPHIRE (DUV GRADE)

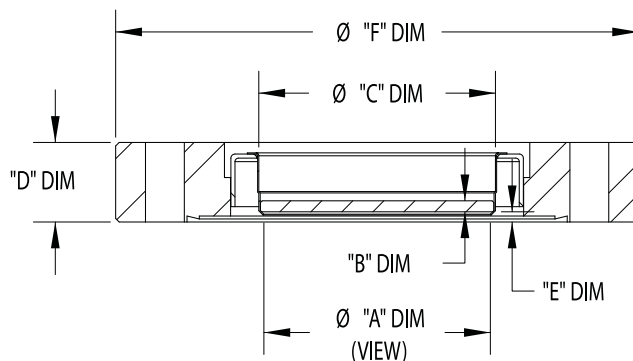


WELDABLE



ADAPTER	Ø "A" DIM (VIEW)	B	C	D	E	H	PART #
STN. STL.	.69	.080	.77	1.500	.030	.44	A8006-1-W
STN. STL.	.94	.080	1.02	1.500	.030	.44	A8006-2-W
STN. STL.	1.44	.080	1.52	2.500	.030	.49	A8006-3-W
STN. STL.	1.94	.094	2.02	2.500	.030	.54	A8006-4-W

CONFLAT FLANGE



Ø "A" DIM (VIEW)	B	C	D	E	F	PART #
.69	.080	.770	.500	.080	2.75	A8007-1-CF
.94	.080	1.02	.500	.080	2.75	A8007-2-CF
1.44	.080	1.52	.680	.13	4.50	A8007-3-CF
1.94	.094	2.02	.680	.10	4.50	A8007-4-CF



VIEWPORTS

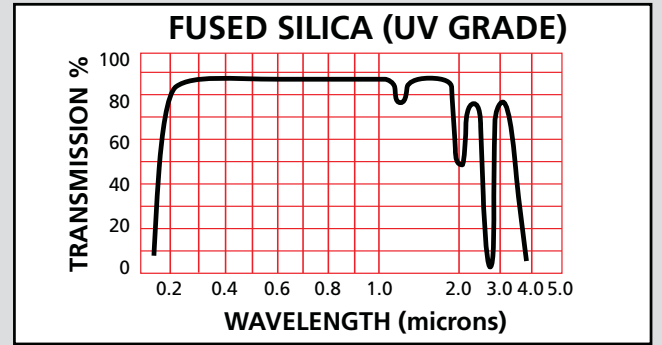
Fused Silica

UV FUSED SILICA

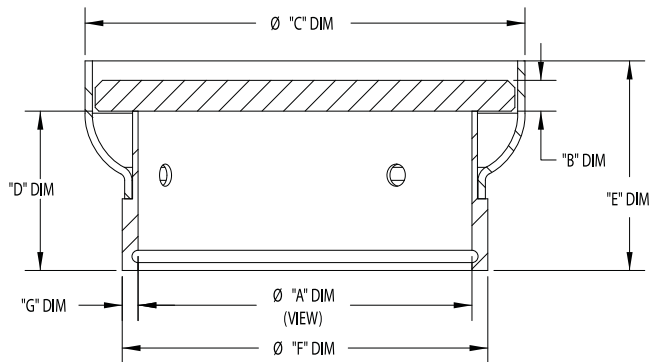
Leak Rate: <math><2 \times 10^{-10}</math> atm cc/sec He
 Parallelism: <math><30</math> Arc Minutes
 Flange Material: 304/316 Stn. Stl.
 Surface Finish: 40/20
 Thermal Range: -100°C to 200°C
 Material: Corning HPFS 7980 Fused Silica
 Transmission: >90% @ 250nm (external)
 Homogeneity Grade: F
 Inclusion Class: 2

Operating Conditions

The thermal ratings specified are safe operating limits determined by various factors including material properties, mechanical design, and the intended operating environment. Temperature ratings for various mounting options may reduce the operating range of a window assembly. All assemblies have a maximum thermal gradient of 25°C per minute and may be damaged if this limit is exceeded.

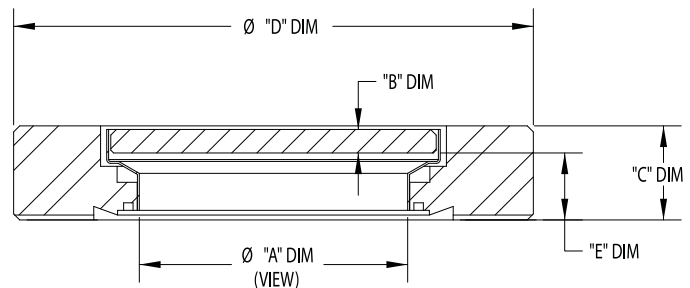
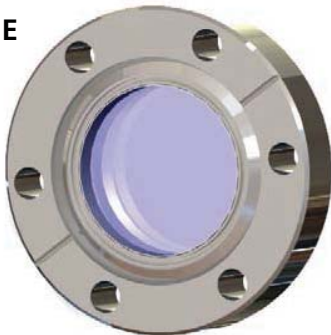


WELDABLE



Ø "A" DIM (VIEW)	B	C	D	E	F	G	PART #
1.37	.13	1.76	.68	.85	1.500	.065	A0657-11-W
2.37	.25	2.88	.79	1.10	2.500	.065	A0657-12-W
3.84	.25	4.41	1.01	1.30	4.500	.085	A0657-13-W

CONFLAT FLANGE



NOM. SIZE	Ø "A" DIM (VIEW)	B	C	D	E	PART #
3/4"	.63	.10	.29	1.33	.17	A1671-1-CF
1 1/2"	1.40	.13	.50	2.75	.35	A0651-1-CF
1 1/2"	1.40	.13	.62	3.37	.35	A0651-2-CF
2 1/2"	2.69	.25	.68	4.50	.41	A0651-3-CF
2 1/2"	2.69	.25	.75	4.62	.41	A0651-4-CF
4"	3.88	.25	.78	6.00	.51	A0651-5-CF
4"	3.88	.25	.84	6.75	.51	A0651-6-CF
6"	5.38	.37	.88	8.00	.48	A0651-7-CF
8"	7.78	.37	.97	10.00	.53	A0651-8-CF

VIEWPORTS

Fused Silica



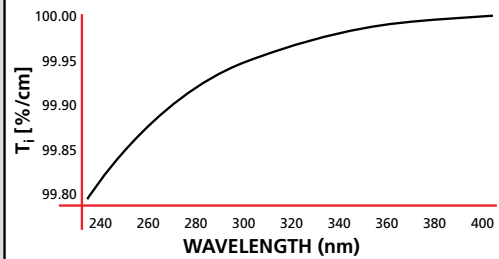
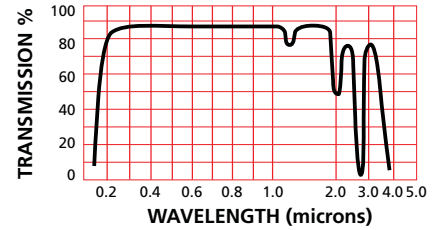
DUV FUSED SILICA (LASER QUALITY)

Leak Rate: <math><2 \times 10^{-10}</math> atm cc/sec He
 Parallelism: <math><10</math> Arc Seconds
 Flange Material: 304/316 Stn. Stl.
 Flatness:
 Surface Finish: 20/10
 Thermal Range: -100°C to 200°C
 Material: Corning HPFS 7980 Fused Silica
 Transmission: $\geq 99.8\%$ @ 248nm (internal)
 Homogeneity Grade: A
 Inclusion Class: 0

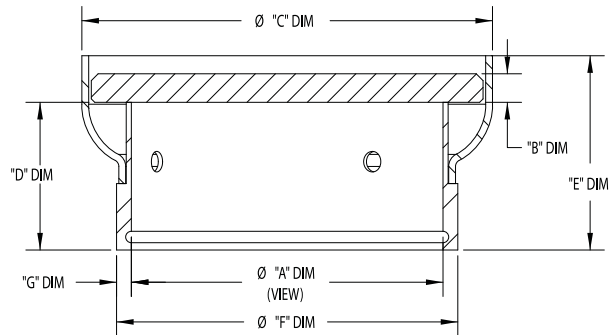
Operating Conditions

The thermal ratings specified are safe operating limits determined by various factors including material properties, mechanical design, and the intended operating environment. Temperature ratings for various mounting options may reduce the operating range of a window assembly. All assemblies have a maximum thermal gradient of 25°C per minute and may be damaged if this limit is exceeded.

FUSED SILICA (DUV GRADE)

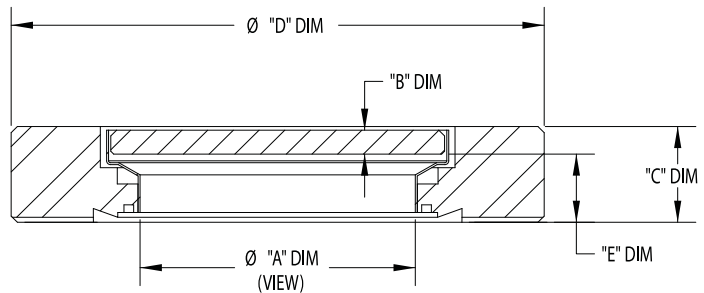


WELDABLE



Ø "A" DIM (VIEW)	B	C	D	E	F	G	PART #
1.37	.13	1.76	.68	.85	1.500	.065	A0657-6-W
2.37	.25	2.88	.79	1.10	2.500	.065	A0657-7-W
3.84	.25	4.41	1.01	1.30	4.500	.085	A0657-8-W

CONFLAT FLANGE



NOM. SIZE	Ø "A" DIM (VIEW)	B	C	D	E	PART #
3/4"	.63	.10	.29	1.33	.17	A1671-2-CF
1 1/2"	1.40	.13	.50	2.75	.35	A0650-1-CF
1 1/2"	1.40	.13	.62	3.37	.35	A0650-2-CF
2 1/2"	2.69	.25	.68	4.50	.41	A0650-3-CF
2 1/2"	2.69	.25	.75	4.62	.41	A0650-4-CF
4"	3.88	.25	.78	6.00	.51	A0650-5-CF



VIEWPORTS

Fused Silica

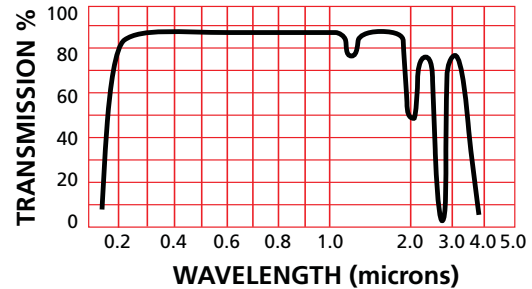
UV FUSED SILICA

Leak Rate: <math><2 \times 10^{-10}</math> atm cc/sec He
 Parallelism: <math><30</math> Arc Minutes
 Flange Material: 304/316 Stn. Stl.
 Surface Finish: 40/20
 Thermal Range: -100°C to 200°C
 Material: Corning HPFS 7980 Fused Silica
 Transmission: >90% @ 250nm (external)
 Homogeneity Grade: F
 Inclusion Class: 2

Operating Conditions

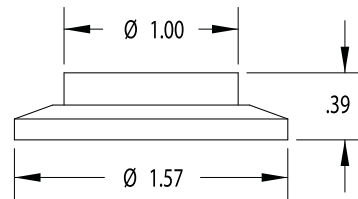
The thermal ratings specified are safe operating limits determined by various factors including material properties, mechanical design, and the intended operating environment. Temperature ratings for various mounting options may reduce the operating range of a window assembly. All assemblies have a maximum thermal gradient of 25°C per minute and may be damaged if this limit is exceeded.

FUSED SILICA (UV GRADE)

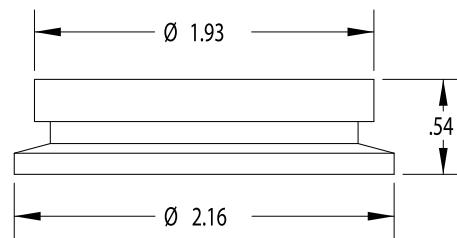


*See page 9 for DUV information.

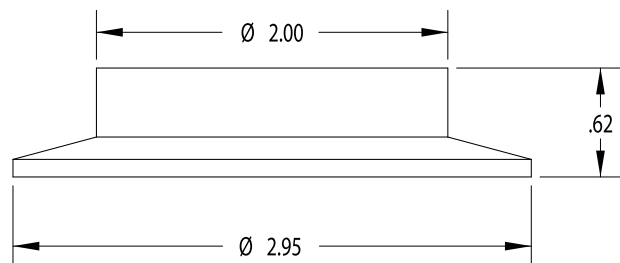
QUICK FLANGE



TYPE	NOM. SIZE	VIEW DIAMETER	FLANGE	PART #
UV Grade	5/8"	.63	QF-25	A4563-1-QF
*DUV Grade - Laser Quality	5/8"	.63	QF-25	A4563-2-QF



TYPE	NOM. SIZE	VIEW DIAMETER	FLANGE	PART #
UV Grade	1 1/2"	1.40	QF-40	A2206-1-QF
*DUV Grade - Laser Quality	1 1/2"	1.40	QF-40	A2206-2-QF



TYPE	NOM. SIZE	VIEW DIAMETER	FLANGE	PART #
UV Grade	1 1/2"	1.40	QF-50	A0816-1-QF
*DUV Grade - Laser Quality	1 1/2"	1.40	QF-50	A0816-2-QF

VIEWPORTS

Fused Silica



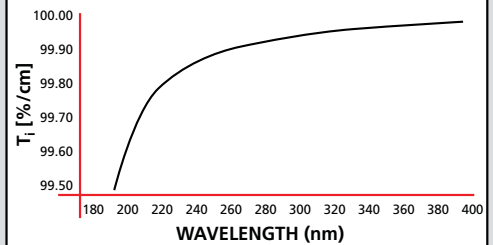
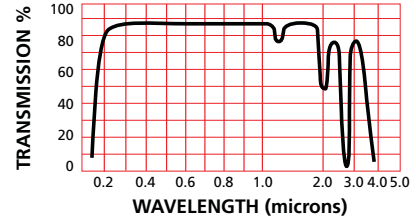
EUV FUSED SILICA (EXCIMER GRADE)

Leak Rate: <math><2 \times 10^{-10}</math> atm cc/sec He
 Parallelism: <math><10</math> Arc Seconds
 Flange Material: 304/316 Stn. Stl.
 Flatness: $\lambda/4$ @ 632nm Transmitted Wavefront
 Surface Finish: 20/10
 Thermal Range: -100°C to 200°C
 Material: Corning HPFS 7980 Excimer Grade 193 Fused Silica
 Transmission: $\geq 99.5\%$ @ 193nm (internal)
 Homogeneity Grade: A
 Inclusion Class: 0

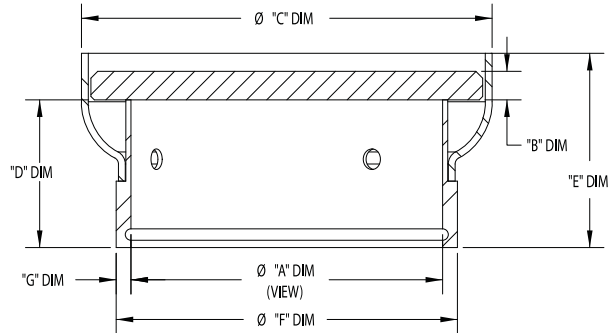
Operating Conditions

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FUSED SILICA (EUV GRADE)

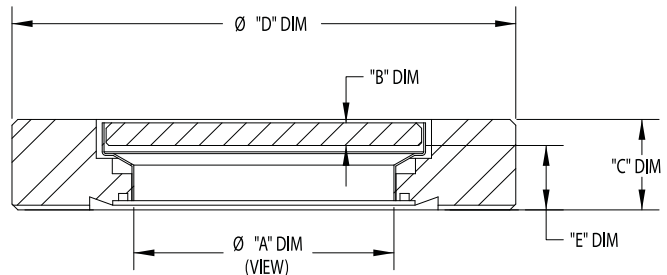


WELDABLE



Ø "A" DIM (VIEW)	B	C	D	E	F	G	PART #
1.37	.13	1.76	.68	.85	1.500	.065	A0657-16-W
2.37	.25	2.88	.79	1.10	2.500	.065	A0657-17-W

CONFLAT FLANGE



NOM. SIZE	Ø "A" DIM (VIEW)	B	C	D	E	PART #
1 1/2"	1.40	.13	.50	2.75	.35	A0652-1-CF
2 1/2"	2.69	.25	.68	4.50	.41	A0652-3-CF



VIEWPORTS

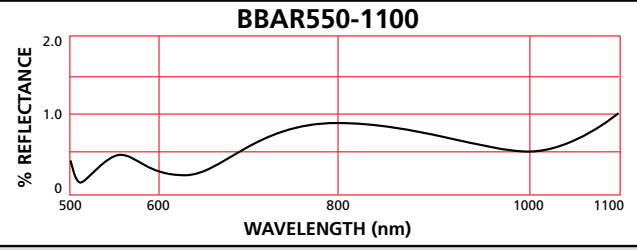
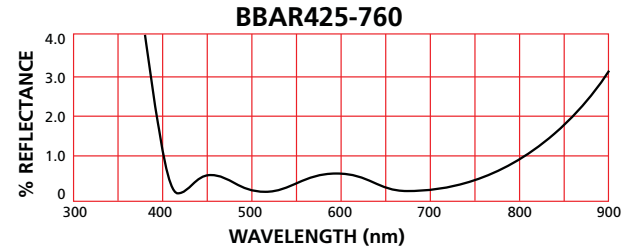
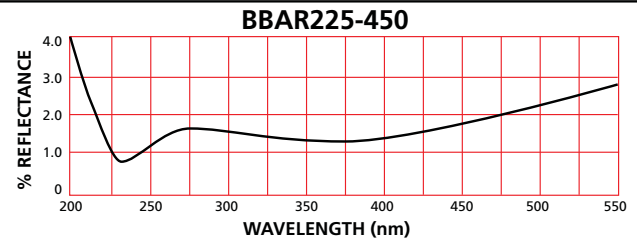
BBAR Coated Fused Silica

BBAR COATED FUSED SILICA

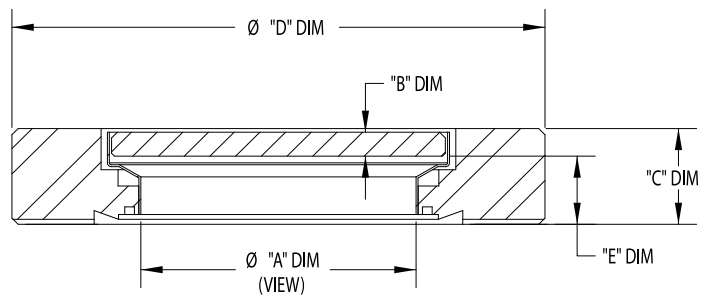
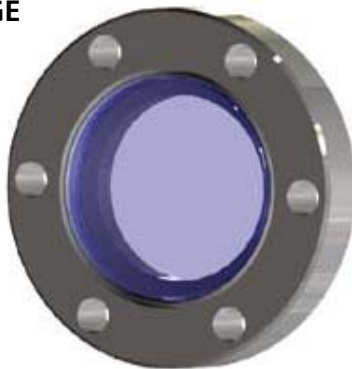
Leak Rate: <math><2 \times 10^{-10}</math> atm cc/sec He
 Parallelism: <math><10</math> Arc Seconds
 Flange Material: 304/316 Stn. Stl.
 Flatness:
 Surface Finish: 20/10
 Thermal Range: -100°C to 200°C
 Material: Corning HPFS 7980 Fused Silica
 Homogeneity Grade: A
 Inclusion Class: 0

Operating Conditions

The thermal ratings specified are safe operating limits determined by various factors including material properties, mechanical design, and the intended operating environment. Temperature ratings for various mounting options may reduce the operating range of a window assembly. All assemblies have a maximum thermal gradient of 25°C per minute and may be damaged if this limit is exceeded.



CONFLAT FLANGE



TYPE	Ø "A" DIM (VIEW)	B	C	D	E	PART #
225-450nm	1.40	.13	.50	2.75	.35	A8000-1-CF
225-450nm	2.69	.25	.68	4.50	.41	A8001-1-CF
425-760nm	1.40	.13	.50	2.75	.35	A8002-1-CF
425-760nm	2.69	.25	.68	4.50	.41	A8003-1-CF
550-1100nm	1.40	.13	.50	2.75	.35	A8004-1-CF
550-1100nm	2.69	.25	.68	4.50	.41	A8005-1-CF

VIEWPORTS

Laser Optics

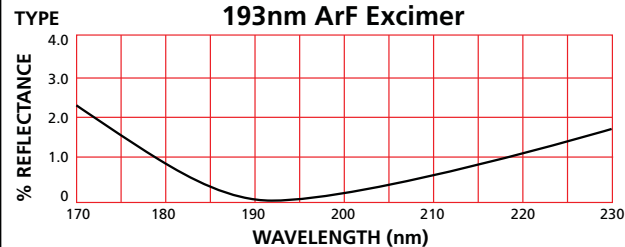
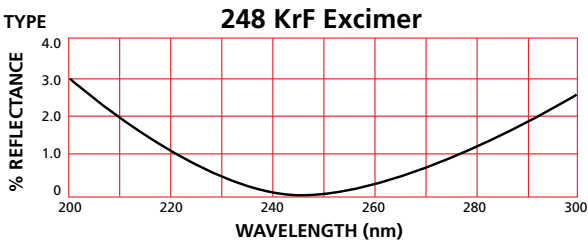
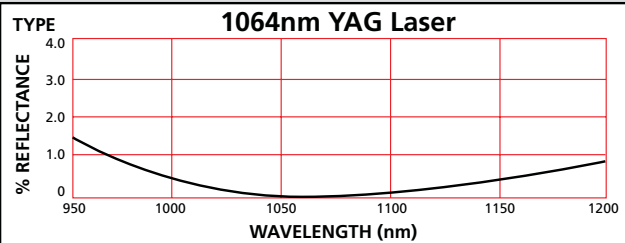
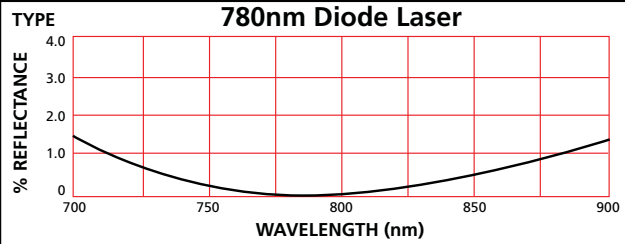


LASER OPTICS

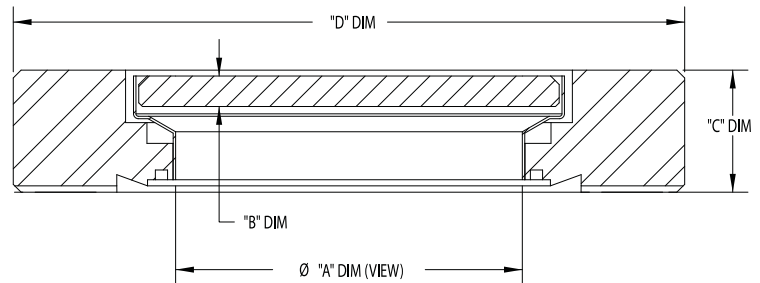
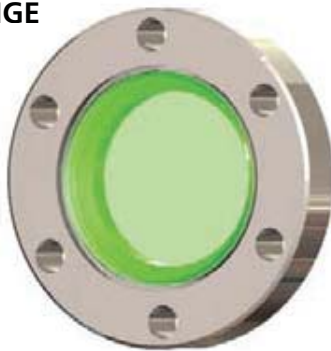
Leak Rate: <math><2 \times 10^{-10}</math> atm cc/sec He
 Parallelism: <math><10</math> Arc Seconds
 Flange Material: 304/316 Stn. Stl.
 Flatness:
 Surface Finish: 20/10
 Thermal Range: -100°C to 200°C
 Material: Corning HPFS 7980 Fused Silica
 Homogeneity Grade: A
 Inclusion Class: 0
 Laser Damage Threshold:
 780nm Diode Laser: 10 J/cm² for 10 ns Pulse
 1064nm YAG Laser: 10 J/cm² for 10 ns Pulse
 193nm ArF Excimer: 1 J/cm² for 10 ns Pulse
 248nm KrF Excimer: 10 J/cm² for 10 ns Pulse

Operating Conditions

The thermal ratings specified are safe operating limits determined by various factors including material properties, mechanical design, and the intended operating environment. Temperature ratings for various mounting options may reduce the operating range of a window assembly. All assemblies have a maximum thermal gradient of 25°C per minute and may be damaged if this limit is exceeded.



CONFLAT FLANGE



TYPE	COATING	Ø "A" DIM (VIEW)	B	C	D	PART #
780nm Diode Laser	V-Coat 780nm R<0.25%	1.4	.125	.500	2.75	A4546-1-CF
780nm Diode Laser	V-Coat 780nm R<0.25%	2.69	.125	.500	4.5	A5802-1-CF
1064nm YAG Laser	V-Coat 1064nm R<0.25%	1.4	.125	.500	2.75	A4545-1-CF
1064nm YAG Laser	V-Coat 1064nm R<0.25%	2.69	.125	.500	4.5	A5803-1-CF
193nm ArF Excimer	V-Coat 193nm R<0.25%	1.4	.125	.500	2.75	A4548-1-CF
193nm ArF Excimer	V-Coat 193nm R<0.25%	2.69	.125	.500	4.5	A5800-1-CF
248 KrF Excimer	V-Coat 248nm R<0.25%	1.4	.125	.500	2.75	A4547-1-CF
248 KrF Excimer	V-Coat 248nm R<0.25%	2.69	.125	.500	4.5	A5801-1-CF



VIEWPORTS

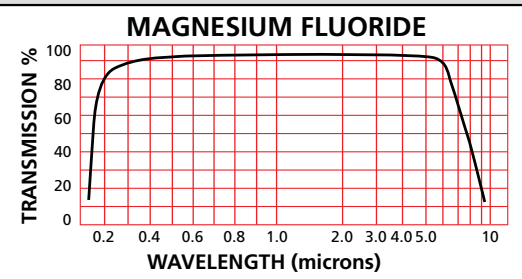
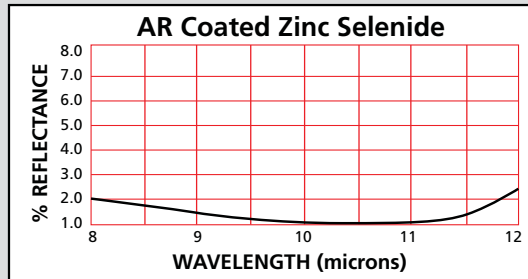
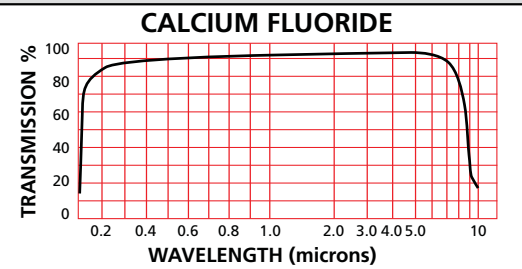
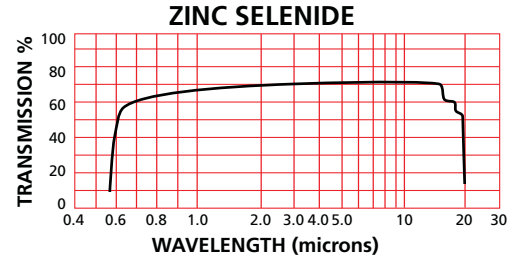
Extended Range Optics

EXTENDED RANGE OPTICS

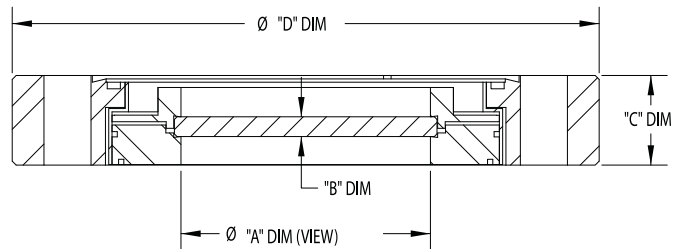
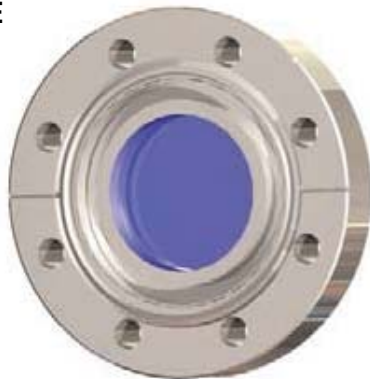
Leak Rate: <math><2 \times 10^{-10}</math> atm cc/sec He
 Parallelism: <math><3</math> Arc Minutes
 Flange Material: 304/316 Stn. Stl.
 Flatness: $\lambda/4$ @ 632nm Transmitted Wavefront
 Surface Finish:
 Zinc Selenide: 40/20 Scratch/Dig
 Calcium Fluoride: 20/10 Scratch/Dig
 Magnesium Fluoride: 20/10 Scratch/Dig
 AR Coated Zinc Selenide: 40/20 Scratch/Dig
 Thermal Range:
 -100°C to 200°C
 AR Coated Zinc Selenide: -100°C to 150°C

Operating Conditions

The thermal ratings specified are safe operating limits determined by various factors including material properties, mechanical design, and the intended operating environment. Temperature ratings for various mounting options may reduce the operating range of a window assembly. All assemblies have a maximum thermal gradient of 25°C per minute and may be damaged if this limit is exceeded.



CONFLAT FLANGE

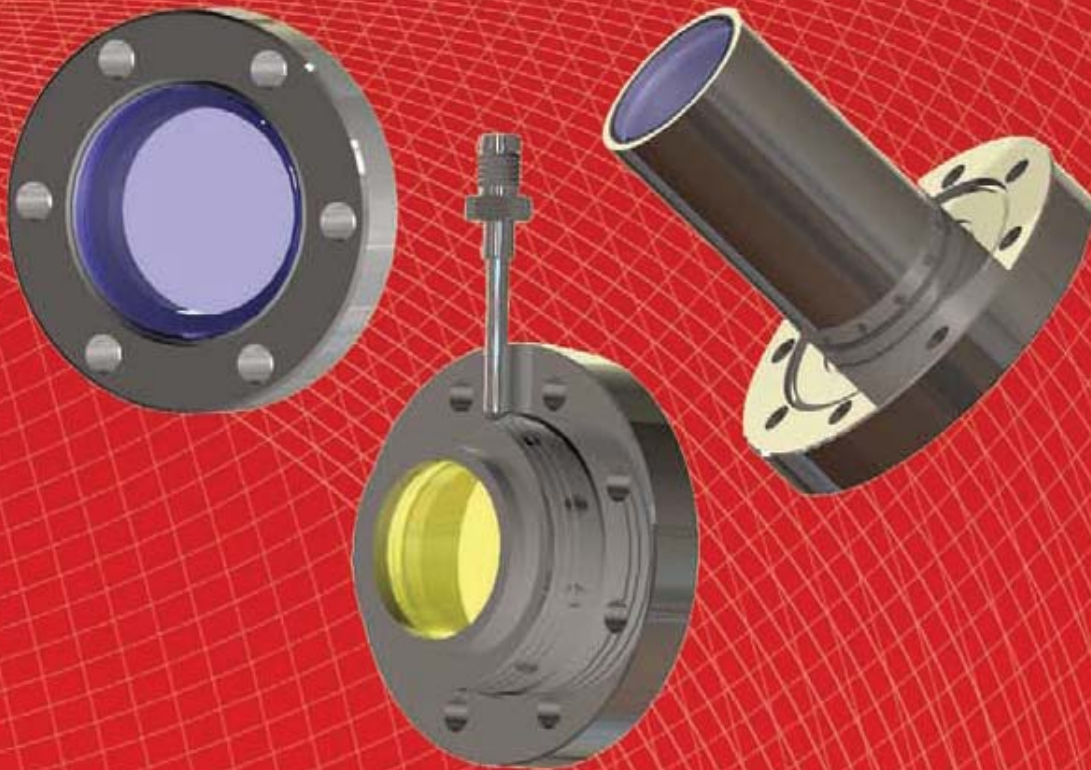


Vacuum Optics – UHV Grade

WINDOW MATERIAL	AR COATED	Ø "A" DIM (VIEW)	B	C	D	PART #
Zinc Selenide	-	.90	.098	.500	2.75	A3982-1-CF
Calcium Fluoride	-	.90	.098	.500	2.75	A4531-1-CF
Magnesium Fluoride	-	.90	.098	.500	2.75	A4530-1-CF
AR Coated Zinc Selenide	8 - 12 Microns	.90	.098	.500	2.75	A4539-1-CF
Zinc Selenide	-	1.88	.150	.680	4.5	A4584-1-CF
Calcium Fluoride	-	1.88	.150	.680	4.5	A4594-1-CF
Magnesium Fluoride	-	1.88	.150	.680	4.5	A4595-1-CF
AR Coated Zinc Selenide	8 - 12 Microns	1.88	.150	.680	4.5	A4297-1-CF

VIEWPORTS

Specialized Optics



MPF Specialized Optics

Differentially Pumped

Specifically designed for extreme high vacuum applications such as Geochronology, MPF's differentially pumped windows employ all-metal, dual-seals having a port that accesses the resulting cavity between the seals. The port can be attached to an auxiliary pump to extend the vacuum range beyond UHV. This design has become the standard for geologists studying argon and helium dating.

Non-Magnetic

For optical applications involving strong magnetic fields or those that are exceedingly sensitive to residual magnetism, MPF offers standard fused silica and extended range viewports made using non-magnetic mounting materials such as 316 LN stainless steel, CP titanium and aluminum.

Re-Entrant

MPF is now offering popular window designs, standard on re-entrant tubing designs. Available in sapphire, fused silica and extended range viewport configurations, these designs are useful for coupling complex lens assemblies such as cameras, telescopes and zoom lenses with applications where reach into a vacuum system is important.



VIEWPORTS

Specialized Optics

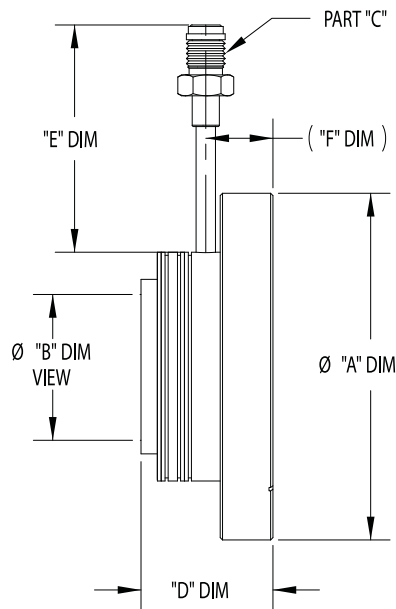
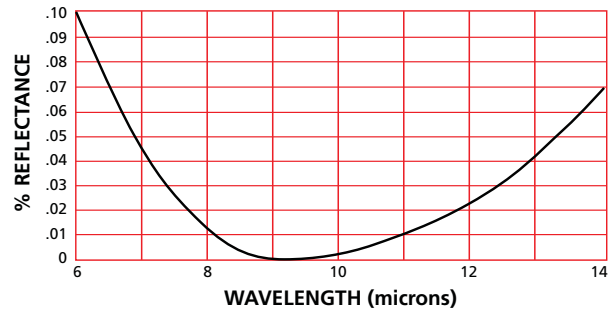
DIFFERENTIALLY PUMPED

Leak Rate: <math><2 \times 10^{-10}</math> atm cc/sec He
 Parallelism: <math><3</math> Arc Minutes
 Flange Material: 304/316 Stn. Stl.
 Flatness:
 Surface Finish: 40/20 Scratch/Dig
 Bake Out Temp: 200°C
 Coating: AR Coated (8-12 Microns)

Operating Conditions

The thermal ratings specified are safe operating limits determined by various factors including material properties, mechanical design, and the intended operating environment. Temperature ratings for various mounting options may reduce the operating range of a window assembly. All assemblies have a maximum thermal gradient of 25°C per minute and may be damaged if this limit is exceeded.

Zinc Sulfide (Cleartran™) 8-12 microns



Ø "A" DIM	Ø "B" DIM (VIEW)	PART "C"	"D" DIM	"E" DIM	"F" DIM	PART #
2.75	.93	1/8" Male VCR	.94	1.80	.77	A7845-1-CF
2.75	.93	1/8" Female VCR	.94	1.80	.77	A7845-2-CF
2.75	.93	1.33" C.F.	.94	1.80	.77	A7845-3-CF
2.75	.93	OMIT	.94	1.80	.77	A7845-4-CF
4.50	1.88	1/4" Male VCR	1.70	2.90	.87	A4523-1-CF
4.50	1.88	1/4" Female VCR	1.70	2.90	.87	A4523-2-CF
4.50	1.88	1.33" C.F.	1.70	2.90	.87	A4523-3-CF
4.50	1.88	OMIT	1.70	2.90	.87	A4523-4-CF

VIEWPORTS

Specialized Optics

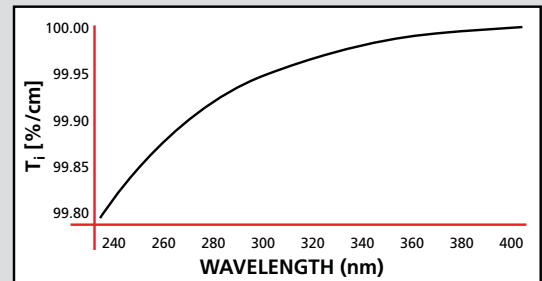
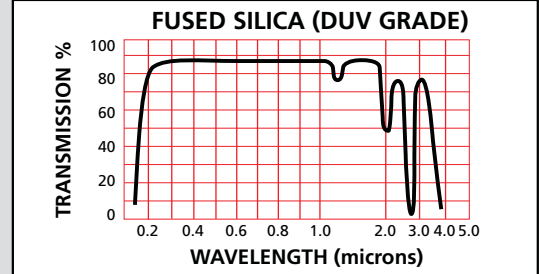


NON-MAGNETIC, FUSED SILICA

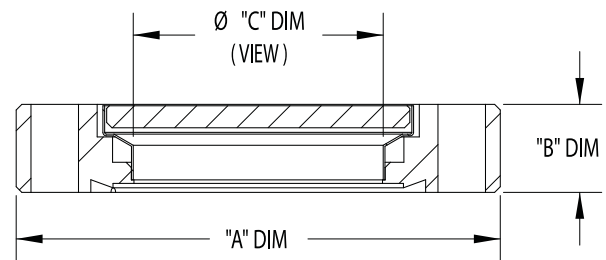
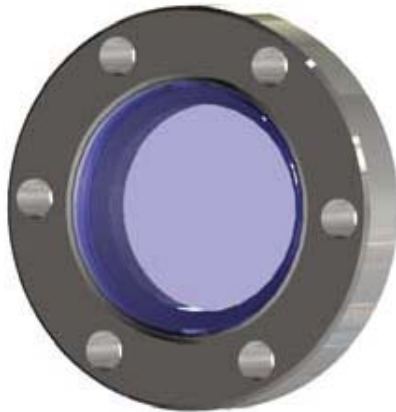
Leak Rate:	<2x10 ⁻¹⁰ atm cc/sec He
Parallelism:	
UV Grade:	<30 Arc Minutes
DUV Grade:	<10 Arc Seconds
Flange Material:	316 LN Stn. Stl.
Flatness:	DUV: λ/4 @ 632nm Transmitted Wavefront
Surface Finish:	
UV Grade:	40/20
DUV Grade:	20/10
Thermal Range:	-100°C to 200°C
Material:	Corning HPFS 7980 Fused Silica
Transmission:	
UV Grade:	>90% @ 250nm (external)
DUV Grade:	≥99.8% @ 248nm (internal)
Homogeneity Grade:	
UV Grade:	F
DUV Grade:	A
Inclusion Class:	
UV Grade:	2
DUV Grade:	0

Operating Conditions

The thermal ratings specified are safe operating limits determined by various factors including material properties, mechanical design, and the intended operating environment. Temperature ratings for various mounting options may reduce the operating range of a window assembly. All assemblies have a maximum thermal gradient of 25°C per minute and may be damaged if this limit is exceeded.



CONFLAT FLANGE



Non-Magnetic

SLEEVE	FLANGE	GRADE	Ø "A" DIM	"B" DIM	Ø "C" DIM (VIEW)	PART #
Titanium	316LN STN. STL.	UV	1.33	.35	.63	A7154-1-CF
Titanium	316LN STN. STL.	UV	2.75	.50	1.40	A7981-1-CF
Titanium	316LN STN. STL.	UV	4.50	.68	2.69	A8711-1-CF
Titanium	316LN STN. STL.	DUV	1.33	.35	.63	A7154-2-CF
Titanium	316LN STN. STL.	DUV	2.75	.50	1.40	A7981-2-CF
Titanium	316LN STN. STL.	DUV	4.50	.68	2.69	A8711-2-CF



VIEWPORTS

Specialized Optics

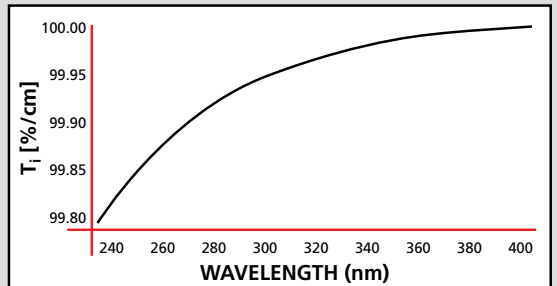
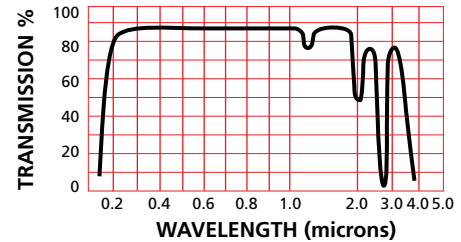
RE-ENTRANT, FUSED SILICA

Leak Rate:	<2x10 ⁻¹⁰ atm cc/sec He
Parallelism:	
UV Grade:	<30 Arc Minutes
DUV Grade:	<10 Arc Seconds
Flange Material:	304/316 Stn. Stl.
Flatness:	DUV: $\lambda/4$ @ 632nm Transmitted Wavefront
Surface Finish:	
UV Grade:	40/20
DUV Grade:	20/10
Thermal Range:	-100°C to 200°C
Material:	Corning HPFS 7980 Fused Silica
Transmission:	
UV Grade:	>90% @ 250nm (external)
DUV Grade:	≥99.8% @ 248nm (internal)
Homogeneity Grade:	
UV Grade:	F
DUV Grade:	A
Inclusion Class:	
UV Grade:	2
DUV Grade:	0

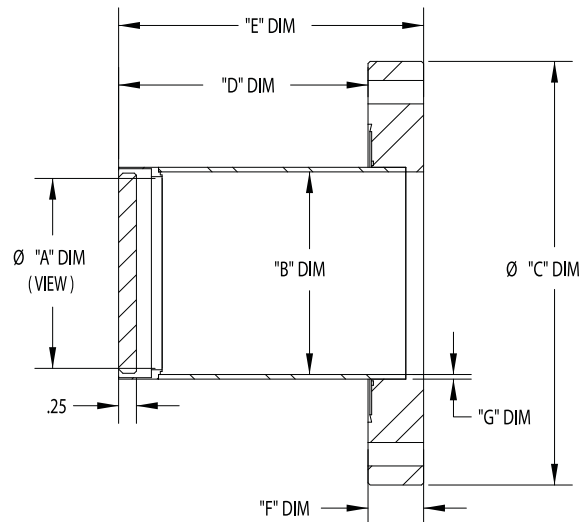
Operating Conditions

The thermal ratings specified are safe operating limits determined by various factors including material properties, mechanical design, and the intended operating environment. Temperature ratings for various mounting options may reduce the operating range of a window assembly. All assemblies have a maximum thermal gradient of 25°C per minute and may be damaged if this limit is exceeded.

FUSED SILICA (DUV GRADE)



CONFLAT FLANGE



Re-Entrant

GRADE	Ø "A" DIM (VIEW)	Ø "B" DIM	Ø "C" DIM	"D" DIM	"E" DIM	"F" DIM	"G" DIM	PART #
UV	1.40	1.90	4.50 C.F.	3.50	4.18	.68	.05	A6665-1-CF
UV	2.69	2.87	6.00 C.F.	3.50	4.28	.78	.07	A6667-1-CF
DUV	1.40	1.90	4.50 C.F.	3.50	4.18	.68	.05	A6665-2-CF
DUV	2.69	2.87	6.00 C.F.	3.50	4.28	.78	.07	A6667-2-CF

MULTIPIN

Multipin is the description for electrical feedthroughs which have two or more conductor paths, and include connectors for one or both sides. This series is typically used for transmission of low power or electrical signals. Multipin feedthroughs are ideal for instrumentation applications such as microscopy, mass spectrometry, surface analysis, and semiconductor process control.

MPF offers several mounting options for multipin feedthroughs: Weldable, Quick Flange (QF), and Conflat Flange (CF). Most designs are also configured for Baseplate and NPT style adapters. Custom adapters, plates and flange configurations are available by request.

High Density Connectors

Subminiature and MS Circular Connectors are very compact and allow for designs with extremely high pin density. All types utilize a straight through pin-to-pin design with gold plated pins that are hermetically sealed and electrically isolated using the latest glass-ceramic bonding technology.

Type C subminiatures are a compact design based on a circular 9 pin arrangement, and can be mounted on 1.33 inch CF flanges or ISO-NW16 quick flanges.

Type D subminiatures are constructed with pin arrangements to meet MIL-C-24308 specifications, and are available in 9, 15, 25, and 50 pin designs. Micro-D also available.

MS Circular Series are double-ended connectors designed to meet MIL-C-26482 pin arrangements in 10, 19, 32, and 41 pin versions.



Multipin and MS Multipin

Traditional multipin designs are provided with threaded circular connectors which allow moderate pin density. These feedthroughs are offered in 3, 5 and 7 pin versions, and are rated to 500 volts and 3.5 amps per pin.

MS multipin is provided with industry standard threaded connectors which meet MIL-C-5015 specification, and are designed to meet similar applications. These feedthroughs are offered in 4 to 35 pin versions, and are rated for 700 volts and 10 amps per pin. Single-ended versions offer a connector for the air side. Double-ended versions offer both air and vacuum side connectors.



MS High Current and High Voltage

These multipin designs provide higher electrical performance combined with the convenience of MS threaded circular connectors. High current multipin feedthroughs are offered in 2 to 8 pin versions, and are rated up to 40 amps per pin. High voltage multipin feedthroughs provide an extremely compact design offered in 2, 4 and 7 pin versions, and are rated to 12,000 volts pin-to-pin and pin-to-shell. These designs are available in double-ended versions upon request.



Multipin

Section 2: Contents

Section	Type	Electrical Rating	Thermal Rating	Pages
2.1	Subminiature Type C & D 9, 15, 25 and 50 pins <i>See Custom Examples, p. 25</i>	Voltage: 500 Volts DC Current: 5 Amps per pin	Feedthrough: -200 to 250°C Air-side Connector: -55 to 80°C Vacuum Connector: -200 to 250°C	22-23
2.2	MS Circular 10, 19, 32, and 41 pins Double-ended <i>See Custom Examples, p. 25</i>	Voltage: 1000 Volts DC Current: 5 Amps per pin	Feedthrough: -269 to 450°C Air-side Connector: -55 to 200°C Vacuum Connector: -269 to 250°C	24
2.3	Multipin 3, 5 and 7 pins	Voltage: 500 Volts DC Current: 3.5 Amps per pin	Feedthrough: -50 to 450°C Air-side Connector: -55 to 65°C	26-27
2.4	MS Multipin 4, 6, 10, 20 and 35 pins Single and Double-ended	Voltage: 700 Volts DC Current: 10 Amps per pin	Feedthrough: -100 to 450°C Air-side Connector: -55 to 124°C Vacuum Connector: -100 to 350°C	28-33
2.5	Multipin Baseplate 8 pins	Voltage: 1000 Volts DC Current: 5 Amps per pin	Feedthrough: -25 to 200°C Air-side Connector: -25 to 200°C Vacuum Connector: -25 to 200°C	34
2.6	MS High Current 2, 3, 4, 5, 7 and 8 pins	Voltage: 700 Volts DC Current: 15 to 40 Amps per pin	Feedthrough: -100 to 450°C Air-side Connector: -55 to 125°C	35-40
2.7	MS High Voltage 2, 4 and 7 pins	Voltage: 12,000 Volts DC Current: 7.5 Amps per pin	Feedthrough: -100 to 450°C Air-side Connector: -55 to 125°C	41-43

Operating Conditions

The electrical and thermal ratings specified are safe operating limits determined by various factors including material properties, mechanical design, and the intended operating environment. All electrical ratings are based on operation with one side in dry atmosphere and the other side in vacuum of 1×10^{-4} Torr maximum pressure. Temperature ratings for various mounting options may reduce the operating range of an assembly. All assemblies have a maximum thermal gradient of 25°C per minute and may be damaged if this limit is exceeded.

Subminiature C-type – 500 Volts / 5 Amps

MATERIALS

Shell: 304 Stainless Steel
 Pins: NiFe Alloy, Gold-plated
 Insulation: Glass-Ceramic

TEMPERATURE RANGE (25°C / MIN)

Feedthrough: -200 to 250°C
 Connector (Air): -55 to 80°C
 Connector (Vacuum): -200 to 250°C



Fig. 1



Fig. 2



Fig. 3



Fig. 4

Each kit is supplied with both an air and vacuum-side cable assembly including connectors. Subminiature-C air and vacuum-side connectors are fitted with captured stainless steel socket head screws which provide a means of securely locking them to their mating feedthroughs.

Kit Includes:

- 9 pin feedthrough CF or QF
- 96" female air-side cable assembly
- 19" female UHV cable assembly

PINS / QTY	FIG	FLANGE	PART #
One 9-pin	1	1.33 / CF16	A2140-1-CF
One 9-pin KIT	<i>not shown</i>	1.33 / CF16	A2139-1-KIT
One 9-pin	<i>not shown</i>	2.75 / CF40	A3046-1-CF
Two 9-pin .750 BC	2	2.75 / CF40	A2141-1-CF
One 9-pin	3	1.18 / QF16	A2143-1-QF
One 9-pin KIT	4	1.18 / QF16	A2142-1-KIT



Contacts
FEMALE PINS

QTY	PART #
Pack of 10	A2386-1-CN



Vacuum-side
Connector
FEMALE PINS

**Does not include contacts*

PINS	PART #
9	A3030-1-CN



Air-side
Connector
FEMALE PINS

**Does not include contacts*

PINS	PART #
9	A3034-1-CN

See Section 7 for connectors, wiring, and other accessories.

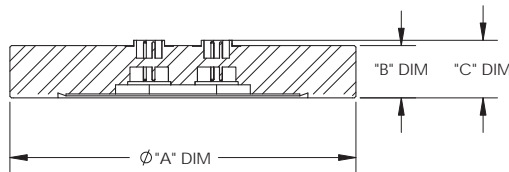


Subminiature D-type — 500 Volts / 5 Amps*
Air-side Connector Included

MATERIALS	TEMPERATURE RANGE (25°C / MIN)
Shell: 304 Stainless Steel	Feedthrough: -200 to 250°C
Pins: NiFe Alloy, Gold-plated	Connector (Air): -55 to 80°C
Insulation: Glass-Ceramic	Connector (Vacuum): -200 to 250°C

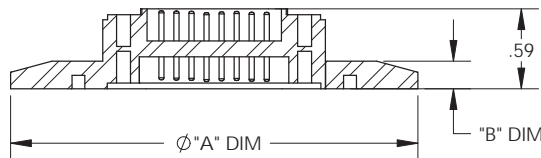
* Micro-D also available. Please contact us for details (864-876-9853)

CONFLAT FLANGE



PINS / QTY	Ø "A" DIM	"B" DIM	"C" DIM	PART #
9	2.75 CF	.50	.57	A1557-1-CF
15	4.50 CF	.68	.75	A1557-2-CF
25	4.50 CF	.68	.75	A1557-3-CF
50	6.00 CF	.78	.85	A1557-4-CF
Two 25-pin	4.50 CF	.68	.75	A2565-1-CF

QUICK FLANGE



PINS / QTY	Ø "A" DIM	"B" DIM	PART #
9	2.16 QF	.20	A1529-1-QF
15	2.95 QF	.20	A1529-2-QF
25	3.74 ISO	.47	A1529-3-QF
50	5.12 ISO	.47	A1529-4-QF
Two 50-pin	5.12 ISO	.47	A1529-5-QF

See Section 7 for connectors, wiring, and other accessories.



MS Circular Connector — 1000 Volts / 5 Amps / Double-ended *Air and Vacuum-side Connectors Included*

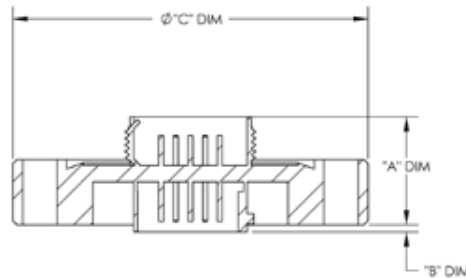
MATERIALS

Shell: 304 Stainless Steel
 Pins: 300 Series SS, Gold-plated
 Insulation: Glass-Ceramic

TEMPERATURE RANGE (25°C / MIN)

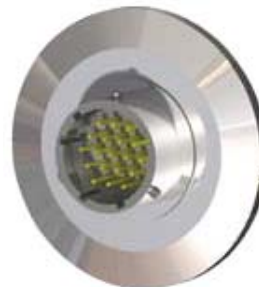
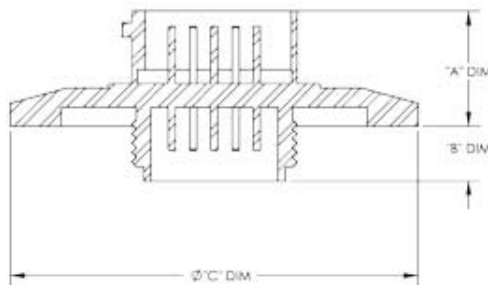
Feedthrough: -269 to 450°C
 Connector (Air): -55 to 200°C
 Connector (Vacuum): -269 to 250°C

CONFLAT FLANGE



PINS / QTY	Ø "A" DIM	"B" DIM	Ø "C" DIM	PART #
10	.83	.06	2.75 CF	A8232-3-CF
19	.83	.06	2.75 CF	A8232-4-CF
32	.83	.06	2.75 CF	A8232-5-CF
41	1.02	OMIT	3.38 CF	A8232-6-CF

QUICK FLANGE



PINS / QTY	Ø "A" DIM	"B" DIM	Ø "C" DIM	PART #
10	.61	.28	2.16 QF	A8233-3-CF
19	.61	.28	2.16 QF	A8233-4-CF
32	.61	.28	2.16 QF	A8233-5-CF
41	.67	.28	2.95 QF	A8233-6-CF

See Section 7 for connectors, wiring, and other accessories.

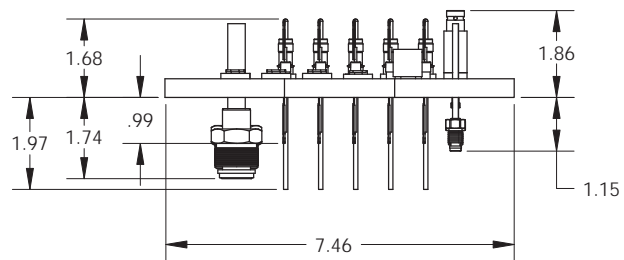


Custom Examples

MPF designs and builds custom flange assemblies specific to customer requirements. Subminiature C & D, Micro-D, and Circular MS Connectors are commonly supplied as integrated components of larger assemblies. MPF provides these assemblies turn-key and ready for use.

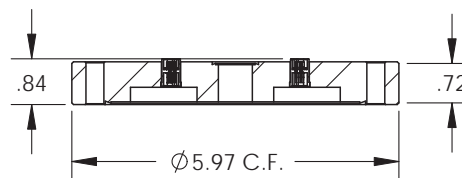
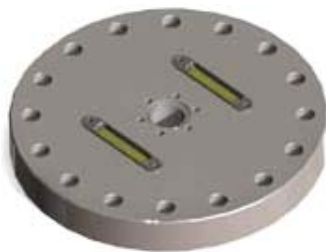
Subminiature D-type

3 x 9-pin and 1 x 15-pin Sub D Feedthroughs mounted with HV and Coax Feedthroughs, Custom Flange.



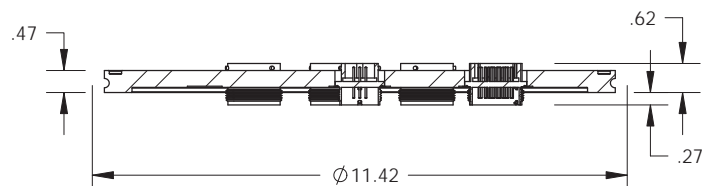
Micro D-type

2 x 100-pin Micro-D Feedthroughs, Custom 6.0 CF Flange w/ Zero-length 1.33CF Adapter



MS Circular Connector

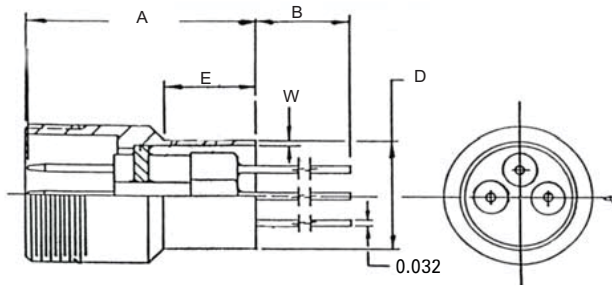
4 x 19-pin and 11 x 32-pin MS Circular Connectors, ISO 250 Flange



500 Volts / 3.5 Amps / 3, 5, & 7 Pin

Air-side Connector Included

WELDABLE

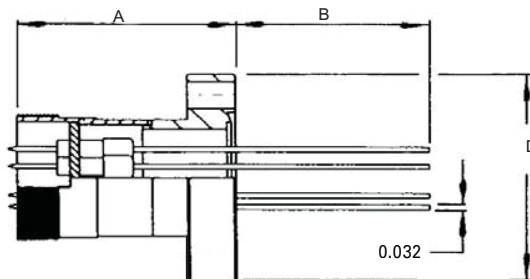


PINS	A	B	D	E	W	PART #
3	.97	2.01	.497	.37	.020	A1607-1-W
5	.84	2.08	.747	.35	.035	A1424-1-W
7	.84	2.08	.747	.35	.035	A1488-1-W

500 Volts / 3.5 Amps / 3, 5, & 7 Pin

Air-side Connector Included

CONFLAT FLANGE



PINS	A	B	D	FLANGE	PART #
3	1.02	1.96	1.33	CF16	A1621-1-CF
5	1.34	1.58	1.33	CF16	A1620-1-CF
5	.89	2.03	2.75	CF40	A1620-2-CF
7	1.34	1.58	1.33	CF16	A1620-3-CF
7	.89	2.03	2.75	CF40	A1620-4-CF

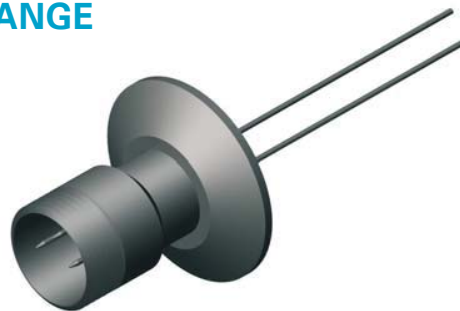
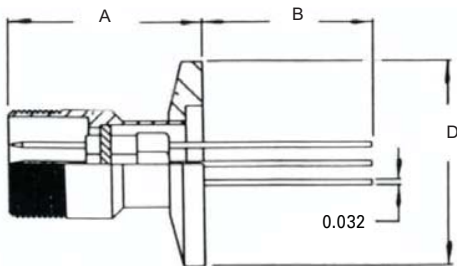
See Section 7 for connectors, wiring, and other accessories.



500 Volts / 3.5 Amps / 3, 5, & 7 Pin

Air-side Connector Included

QUICK FLANGE

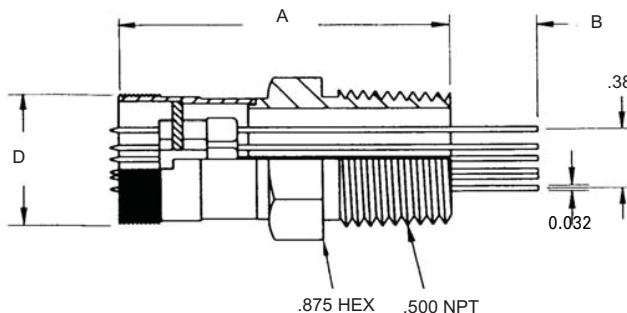


PINS	A	B	D	PART #
3	1.07	1.91	1.18 / QF16	A1622-1-QF
3	.97	2.01	2.16 / QF40	A1622-2-QF
5	1.34	1.58	1.18 / QF16	A1623-1-QF
5	.84	2.08	2.16 / QF40	A1623-2-QF
5	.84	2.08	2.95 / QF50	A1623-3-QF
7	1.34	1.58	1.18 / QF16	A1623-4-QF
7	.84	2.08	2.16 / QF40	A1623-5-QF
7	.89	2.08	2.95 / QF50	A1623-6-QF

500 Volts / 3.5 Amps / 5, & 7 Pin

Air-side Connector Included

NPT PIPE THREAD

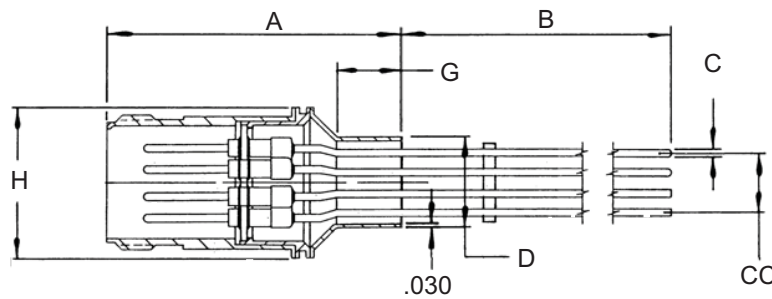


PINS	A	B	D	PART #
5	1.99	.93	.81	A1624-1-NPT
7	1.99	.93	.81	A1624-2-NPT

See Section 7 for connectors, wiring, and other accessories.



700 Volts / 10 Amps *per Pin* / 4 to 35 Pins
0.056 or 0.062 Alumel Conductors
Air-side Connector Included
WELDABLE

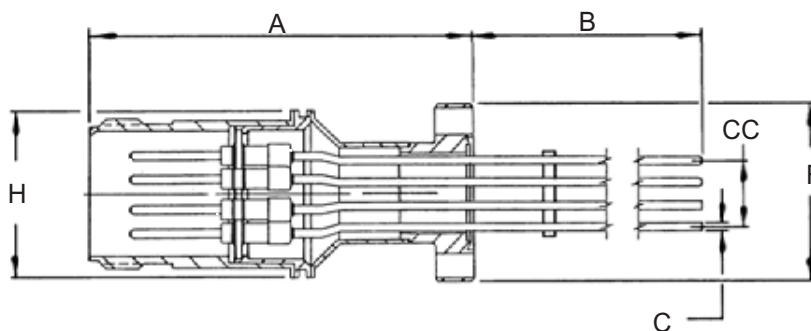


PINS	AMPS*	A	B	C	D	G	H	CC	PART #
4	28	2.43	3.12	.056	.747	.47	1.25	.38	A0429-4-W
6	36	2.43	3.12	.056	.747	.47	1.25	.44	A0429-8-W
10	50	2.43	3.12	.056	.747	.47	1.25	.51	A0429-12-W
20	75	2.53	3.47	.056	1.372	.75	1.75	1.03	A0204-4-W
35	100	3.98	2.10	.056	1.500	1.94	2.25	1.22	A0739-1-W
35	100	3.10	2.98	.056	1.745	1.33	2.25	1.47	A2248-1-W
4	28	2.43	3.12	.062	.747	.47	1.25	.38	A3525-1-W
6	36	2.43	3.12	.062	.747	.47	1.25	.44	A3526-1-W
10	50	2.43	3.12	.062	.747	.47	1.25	.51	A3527-1-W

* Max amperage all pins loaded



700 Volts / 10 Amps *per Pin* / 4 to 35 Pins
0.056 or 0.062 Alumel Conductors
Air-side Connector Included
CONFLAT FLANGE

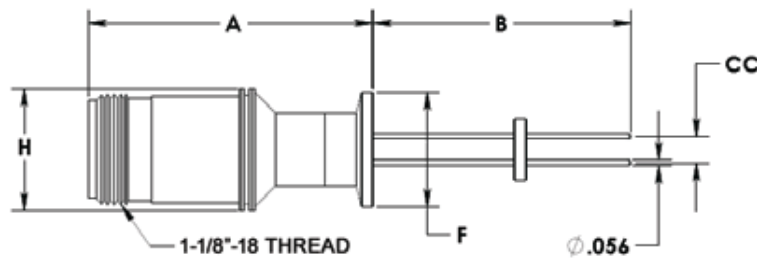


PINS	AMPS*	A	B	C	F	H	CC	PART #
4	28	2.93	2.62	.056	1.33	1.25	.38	A0192-4-CF
4	28	2.48	3.07	.056	2.75	1.25	.38	A0193-4-CF
6	36	2.93	2.62	.056	1.33	1.25	.44	A0192-8-CF
6	36	2.48	3.07	.056	2.75	1.25	.44	A0193-8-CF
10	50	2.93	2.62	.056	1.33	1.25	.51	A0192-12-CF
10	50	2.48	3.07	.056	2.75	1.25	.51	A0193-12-CF
20	75	2.58	3.42	.056	2.75	1.75	1.03	A0206-4-CF
20	75	2.58	3.42	.056	4.50	1.75	1.03	A0208-4-CF
35	100	3.15	2.93	.056	3.38	2.25	1.47	A0743-1-CF
35	100	4.03	2.05	.056	2.75	2.25	1.22	A0741-1-CF
35	100	3.15	2.93	.056	4.50	2.25	1.47	A0743-2-CF
4	28	2.93	2.62	.062	1.33	1.25	.38	A3513-1-CF
6	36	2.93	2.62	.062	1.33	1.25	.44	A3514-1-CF
10	50	2.93	2.62	.062	1.33	1.25	.51	A3532-1-CF

* Max amperage all pins loaded



700 Volts / 10 Amps *per Pin* / 4 to 35 Pins
0.056 or 0.062 Alumel Conductors
Air-side Connector Included
QUICK FLANGE

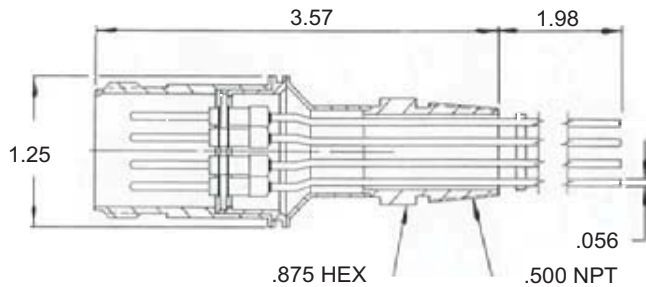


PINS	AMPS*	A	B	C	F	H	CC	PART #
4	28	2.93	2.62	.056	1.18	1.25	.38	A0197-4-QF
4	28	2.43	3.12	.056	2.16	1.25	.38	A0194-4-QF
6	36	2.93	2.62	.056	1.18	1.25	.44	A0197-8-QF
6	36	2.43	3.12	.056	2.16	1.25	.44	A0194-8-QF
10	50	2.93	2.62	.056	1.18	1.25	.51	A0197-12-QF
10	50	2.43	3.12	.056	2.16	1.25	.51	A0194-12-QF
20	75	2.53	3.47	.056	2.16	1.75	1.03	A0209-4-QF
20	75	2.53	3.47	.056	2.95	1.75	1.03	A0210-4-QF
35	100	4.08	2.00	.056	2.16	2.25	1.47	A0745-1-QF
35	100	3.10	2.93	.056	2.95	2.25	1.47	A0745-2-QF
4	28	2.93	2.62	.062	1.18	1.25	.38	A3511-1-QF
6	36	2.93	2.62	.062	1.18	1.25	.44	A3506-1-QF
10	50	2.93	2.62	.062	1.18	1.25	.51	A3512-1-QF

* Max amperage all pins loaded



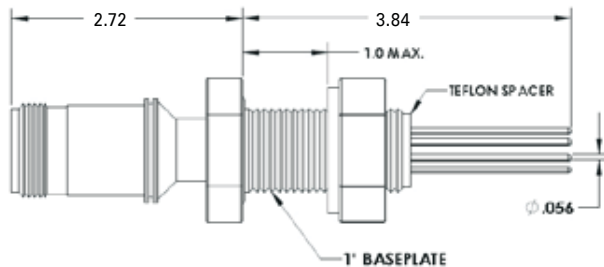
700 Volts / 10 Amps *per Pin* / 4 to 10 Pins
0.056 Alumel Conductors
Air-side Connector Included
NPT PIPE THREAD



PINS / QTY	AMPS	PART #
4	28	A0198-4-NPT
6	36	A0198-8-NPT
10	50	A0198-12-NPT

* Max amperage all pins loaded

1" BASEPLATE



PINS / QTY	AMPS	PART #
4	28	A2968-3-BP
6	36	A2968-2-BP
10	50	A2968-1-BP

* Max amperage all pins loaded

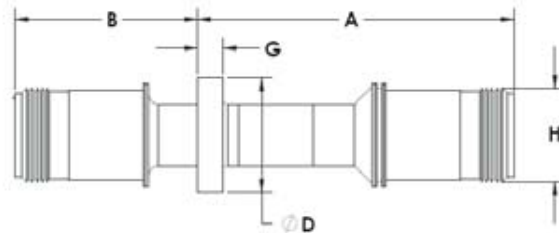
See Section 7 for connectors, wiring, and other accessories.



700 Volts / 10 Amps *per Pin* / 4 to 35 Pins / Double-ended

Air and Vacuum-side Connectors Included

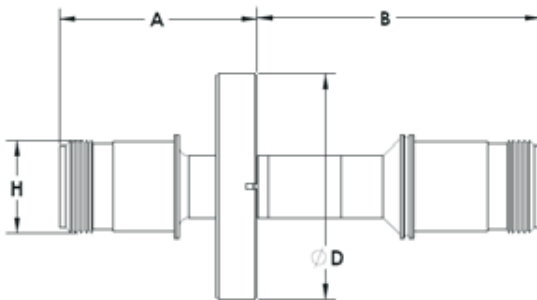
WELDABLE



PINS	AMPS*	FIG	A	B	D	G	H	PART #
4	28	1	3.49	2.36	1.372	.31	1.25	A1086-1-W
6	36	1	3.49	2.36	1.372	.31	1.25	A1089-1-W
10	50	1	3.49	2.36	1.372	.31	1.25	A1069-1-W
20	75	1	3.50	2.78	2.495	.38	1.75	A1090-1-W
35	100	1	3.89	2.50	2.495	.38	2.25	A1091-1-W

* Max amperage all pins loaded

CONFLAT



PINS	AMPS*	FIG	A	B	D	H	PART #
4	28	2	2.41	3.44	2.75/CF40	1.25	A2208-1-CF
6	36	2	2.41	3.44	2.75/CF40	1.25	A1834-1-CF
10	50	2	2.41	3.44	2.75/CF40	1.25	A2576-1-CF
20	75	2	2.83	3.50	4.50/CF63	1.75	A2577-1-CF
35	100	2	2.55	3.84	4.50/CF63	2.25	A1379-1-CF
35	100	2	2.55	3.84	6.00/CF100	2.25	A1884-1-CF

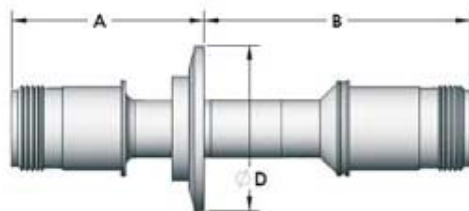
* Max amperage all pins loaded

See Section 7 for connectors, wiring, and other accessories.



700 Volts / 10 Amps *per Pin* / 4 to 10 Pins / Double-ended
Air and Vacuum-side Connectors Included

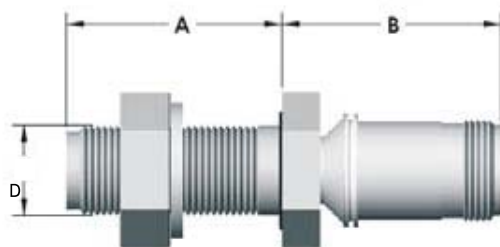
QUICK FLANGE



PINS	AMPS*	FIG	A	B	D	PART #
4	28	1	2.46	3.49	2.16/QF40	A2563-1-QF
4	28	1	2.36	3.49	2.95/QF50	A2563-2-QF
6	36	1	2.46	3.49	2.16/QF40	A2564-1-QF
6	36	1	2.36	3.49	2.95/QF50	A2564-2-QF
10	50	1	2.46	3.49	2.16/QF40	A1062-1-QF
10	50	1	2.36	3.49	2.95/QF50	A1062-2-QF

* Max amperage all pins loaded

1" BASEPLATE



PINS	AMPS*	FIG	A	B	D	PART #
10	50	2	2.33	2.37	1.00	A3995-1-BP

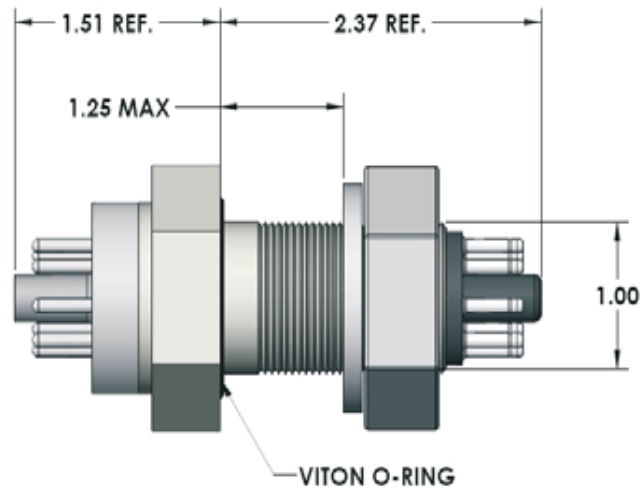
* Max amperage all pins loaded



1000 Volts / 5 Amps per Pin / 8 Pins

Air and Vacuum-side Connectors Included

1" BASEPLATE



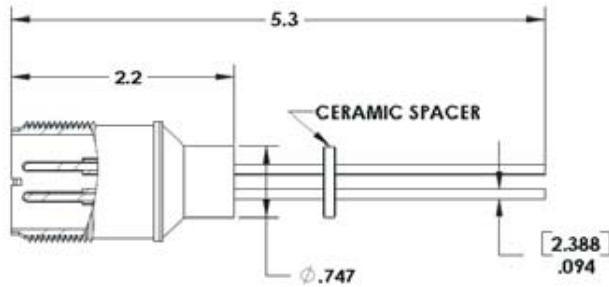
PINS	AMPS*	PART #
8	5	A3533-1-BP

* Max amperage all pins loaded

See Section 7 for connectors, wiring, and other accessories.

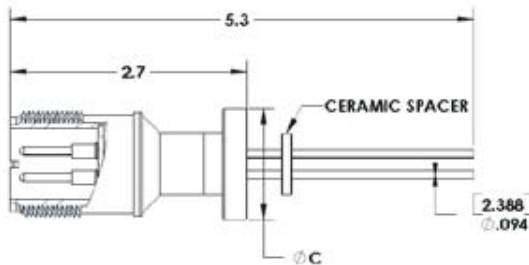


700 Volts / 28 Amps per Pin / 2 & 4 Pins
Nickel and Moly Conductors
Air-side Connector Included
WELDABLE



PINS	AMPS Ni / Moly	PART #	
		NICKEL	MOLY
2	16 / 28	A2566-1-W	A2566-3-W
4	16 / 28	A2566-5-W	A2566-7-W

CONFLAT FLANGE

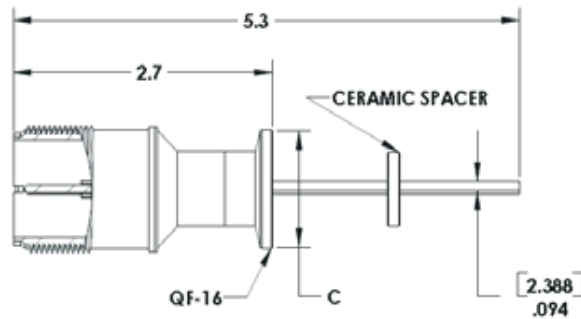


PINS	AMPS Ni / Moly	C	PART #	
			NICKEL	MOLY
2	16 / 28	1.33/CF16	A2568-1-CF	A2568-3-CF
4	16 / 28	1.33/CF16	A2568-5-CF	A2568-7-CF
2	16 / 28	2.75/CF40	A2569-1-CF	A2569-3-CF
4	16 / 28	2.75/CF40	A2569-5-CF	A2569-7-CF

See Section 7 for connectors, wiring, and other accessories.



700 Volts / 28 Amps *per Pin* / 2 & 4 Pins
Nickel and Moly Conductors
Air-side Connector Included
QUICK FLANGE

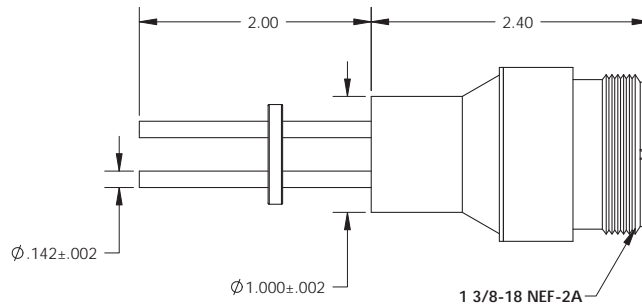
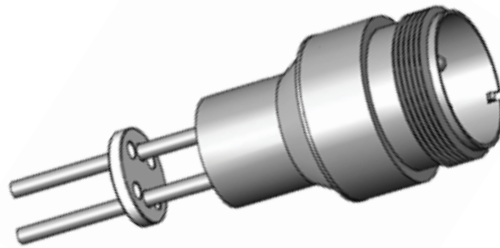


PINS	AMPS Ni / Moly	C	PART #	
			NICKEL	MOLY
2	16 / 28	1.18/QF16	A2567-1-QF	A2567-3-QF
4	16 / 28	1.18/QF16	A2567-5-QF	A2567-7-QF
2	16 / 28	1.57/QF25	A3991-1-QF	A3991-3-QF
4	16 / 28	1.57/QF25	A3991-5-QF	A3991-7-QF
2	16 / 28	2.16/QF40	A3992-1-QF	A3992-3-QF
4	16 / 28	2.16/QF40	A3992-5-QF	A3992-7-QF

See Section 7 for connectors, wiring, and other accessories.



700 Volts / 40 Amps *per Pin* / 2 & 4 Pins
Nickel and Moly Conductors
Air-side Connector Included
WELDABLE

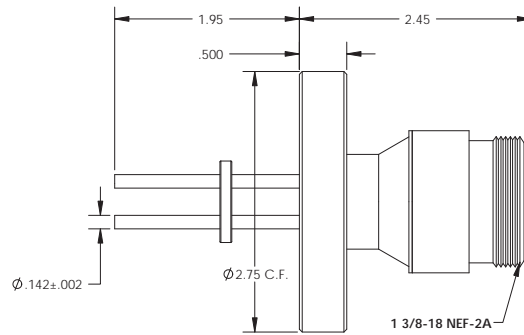
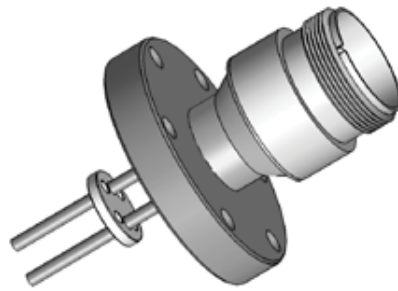


PINS	AMPS	CONDUCTOR	PART #
2	40	MOLY	A5076-1-W
2	25	NICKEL	A5076-3-W
4	40	MOLY	A4748-1-W
4	25	NICKEL	A4748-3-W

See Section 7 for connectors, wiring, and other accessories.



700 Volts / 40 Amps *per Pin* / 2 & 4 Pins
Nickel and Moly Conductors
Air-side Connector Included
CONFLAT FLANGE

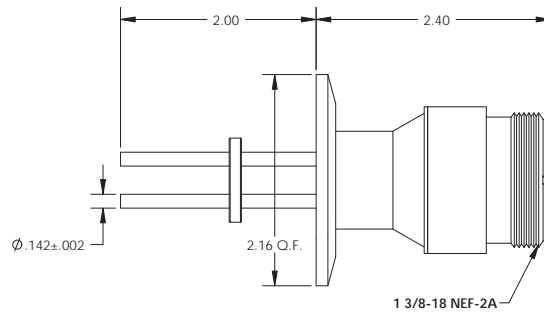
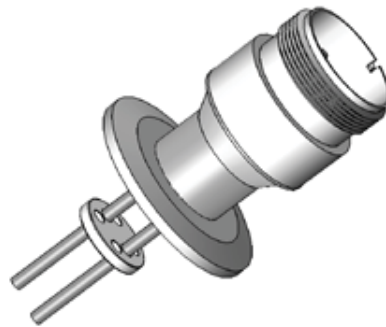


PINS	AMPS	CONDUCTOR	PART #
2	40	MOLY	A5077-1-CF
2	25	NICKEL	A5077-3-CF
4	40	MOLY	A4852-1-CF
4	25	NICKEL	A4852-3-CF

See Section 7 for connectors, wiring, and other accessories.



700 Volts / 40 Amps *per Pin* / 2 & 4 Pins
Nickel and Moly Conductors
Air-side Connector Included
QUICK FLANGE



PINS	AMPS	CONDUCTOR	PART #
2	40	MOLY	A5078-1-QF
2	25	NICKEL	A5078-3-QF
4	40	MOLY	A5079-1-QF
4	25	NICKEL	A5079-3-QF

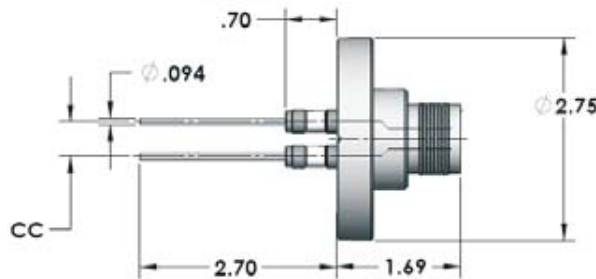
See Section 7 for connectors, wiring, and other accessories.



700 Volts / 23 Amps *per Pin* / 2 to 8 Pins

Air-side Connector Included

CONFLAT FLANGE



PINS	AMPS	VOLTS	CONDUCTOR	CC	PART #
2	23	700	COPPER	.48	A0754-1-CF
2	15	700	NICKEL	.48	A0754-2-CF
3	23	1750	COPPER	.64	A0753-1-CF
3	15	1750	NICKEL	.65	A0753-2-CF
4	23	1250	COPPER	.65	A0756-1-CF
4	15	1250	NICKEL	.75	A0756-2-CF
5	23	700	COPPER	.75	A0755-1-CF
5	15	700	NICKEL	.75	A0755-2-CF
7	23	700	COPPER	.75	A0752-1-CF
7	15	700	NICKEL	.75	A0752-2-CF
8	23	700	COPPER	*	A0757-1-CF
8	15	700	NICKEL	*	A0757-2-CF

*Not equally spaced

See Section 7 for connectors, wiring, and other accessories.

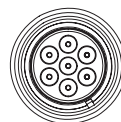
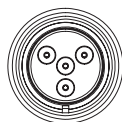
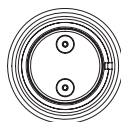
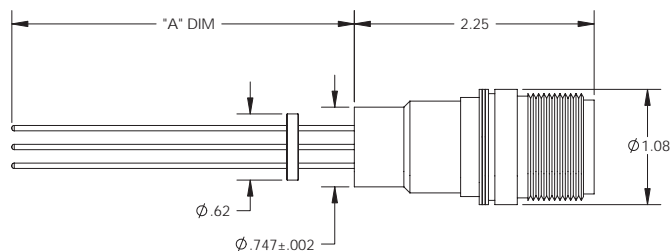


12,000 Volts / 7.5 Amps *per Pin* / 2 to 7 Pins

MS Style MIL-C-5015

Air-side Connector Included

WELDABLE

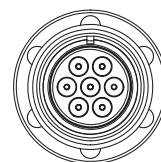
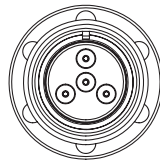
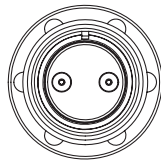
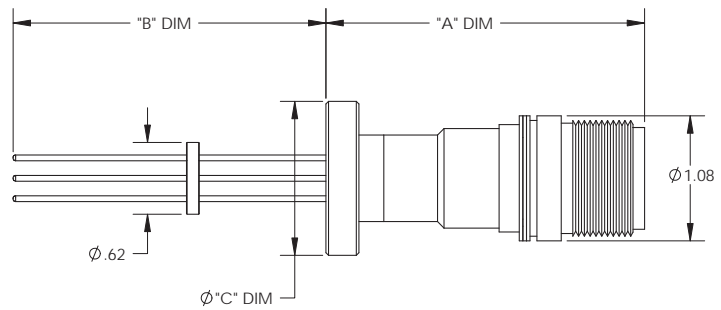
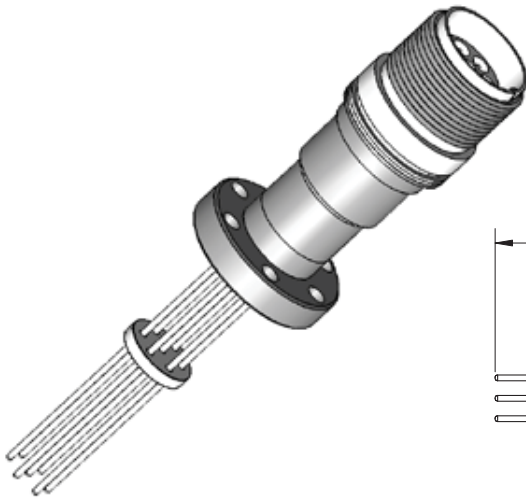


PINS	"A" DIM	CONNECTOR	PART #
2	3.20	YES	A4207-1-W
4	3.20	YES	A4208-1-W
7	3.20	YES	A3084-1-W

See Section 7 for connectors, wiring, and other accessories.



12,000 Volts / 7.5 Amps per Pin / 2 to 7 Pins
MS Style MIL-C-5015
Air-side Connector Included
CONFLAT FLANGE

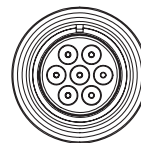
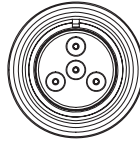
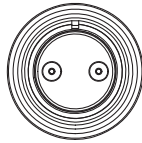
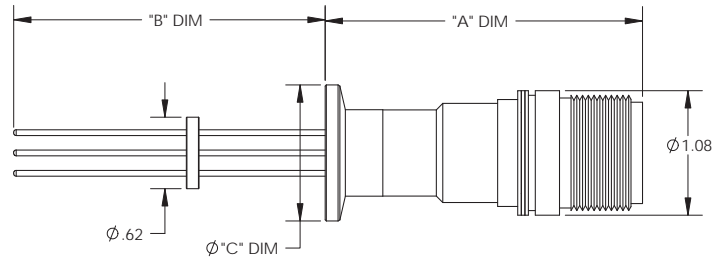
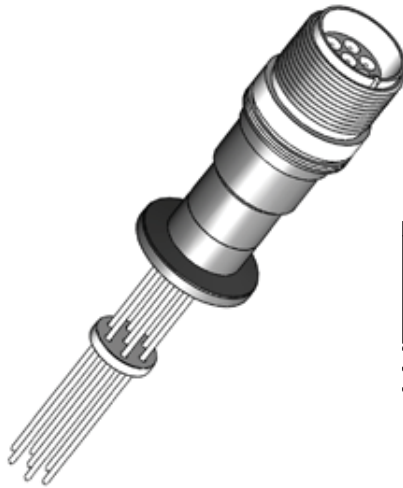


PINS	"A" DIM	"B" DIM	Ø "C" DIM	PART #
2	2.75	2.70	1.33	A3970-1-CF
2	2.33	3.12	2.75	A3972-1-CF
4	2.75	2.70	1.33	A3971-1-CF
4	2.33	3.12	2.75	A3976-1-CF
7	2.75	2.70	1.33	A3086-1-CF
7	2.33	3.12	2.75	A3977-1-CF

See Section 7 for connectors, wiring, and other accessories.



12,000 Volts / 7.5 Amps per Pin / 2 to 7 Pins
MS Style MIL-C-5015
Air-side Connector Included
QUICK FLANGE



PINS	"A" DIM	"B" DIM	Ø "C" DIM	PART #
2	2.75	2.70	1.18	A6077-1-QF
2	2.35	3.10	2.16	A6078-1-QF
4	2.75	2.70	1.18	A6079-1-QF
4	2.35	3.10	2.16	A6080-1-QF
7	2.75	2.70	1.18	A6081-1-QF
7	2.35	3.10	2.16	A6082-1-QF

See Section 7 for connectors, wiring, and other accessories.



THERMOCOUPLE

Thermocouple is the description for electrical feedthroughs that are commonly used for temperature measurement systems. A thermocouple feedthrough does not measure temperature, but rather it is used to conduct the thermocouple's voltage signal from inside the vacuum system to an external instrumentation device. MPF uses ceramic-to-metal sealing technology to braze various metals used in thermocouple assemblies to high purity alumina ceramic insulators. Thermocouple feedthroughs are suitable for ultra high vacuum applications.

MPF offers several mounting options for all standard products: Weldable, Quick Flange (QF), and Conflat Flange (CF). Most designs are also configured for Baseplate and NPT style adapters. Custom adapters, plates and flange configurations are available by request.

Miniature & Screw Type Connectors

The most popular Thermocouple connections are miniature and screw type connections, which are commonly used in many thermocouple applications. MPF offers miniature connectors for C, E, J and K type thermocouples. N, R, S and T type thermocouples require a screw and nut connection.

MS Connectors

Industry standard threaded connectors are available E, J and K type thermocouples. MS Connectors provide high pin density and convenient circular style connectors for the air and vacuum sides, which accommodate up to 10 pairs of thermocouple leads.

Thermocouple and Power Combination

Many applications involve power leads to drive a process and the need for process control information provided by thermocouples. MPF offers several standard designs which combine thermocouple and power feedthroughs into a single assembly.



Thermocouple Reference Table

Type	Thermocouple Material	Polarity	Operating Temperature Range
 K	Chromel Alumel	+ -	-184 to 1260°C
 C	Tungsten 5% Rhenium Tungsten 26% Rhenium	+ -	0 to 2760°C
 E	Chromel Constantan	+ -	-184 to 900°C
 J	Iron Constantan	+ -	0 to 750°C
 T	Copper Constantan	+ -	-184 to 400°C
 N	NI-CR-SI NI-SI-MG	+ -	-270 to 1300°C
 R	Platinum 13% Rhodium Platinum	+ -	0 to 1540°C
 S	Platinum 10% Rhodium Platinum	+ -	0 to 1540°C

Thermocouple

Section 3: Contents

Section	Type	Electrical Rating	Thermal Rating	Pages
3.1	Single Leg Pairs Screw and Nut Connections Miniature Connector Types: C*, E, J and K	Voltage: Milli-Volts Current: Milli-Amps	Feedthrough: -100 to 450°C Air-side Connector: -65 to 125°C	46
3.2	Connector Fitted 1, 2, 3, 4 and 5 Thermocouple Pairs Types: C*, E, J and K	Voltage: Milli-Volts Current: Milli-Amps	Feedthrough: -100 to 450°C Air-side Connector: -65 to 125°C	47-54
3.3	Screw Type Connection 1, 2, 3, 4 and 5 Thermocouple Pairs Types: N*, R*, S* and T*	Voltage: Milli-Volts Current: Milli-Amps	Feedthrough: -100 to 450°C	55-62
3.4	MS Connectors 2, 3, 5 and 10 Thermocouple Pairs Types: E, J and K Single and Double-ended	Voltage: Milli-Volts Current: Milli-Amps	Feedthrough: -100 to 450°C Air-side Connector: -65 to 125°C Vacuum Connector: -100 to 350°C	63-67
3.5	Push-On Connectors 2, 3 and 5 Thermocouple Pairs Types: E, J and K	Voltage: Milli-Volts Current: Milli-Amps	Feedthrough: -100 to 450°C	68-69
3.6	Thermocouple / Power 1 T/C Pair + 2 Power Pins 1 or 2 T/C Pairs + 3 Power Pins 1 or 2 T/C Pairs + 2 Power Pins Types: C*, E, J and K	Voltage: to 5000 Volts DC (Power) Current: to 150 Amps (Power)	Feedthrough: -100 to 450°C Air-side Connector: -65 to 125°C	70-74

* Note: C, N, R, S and T use extension grade materials

Operating Conditions

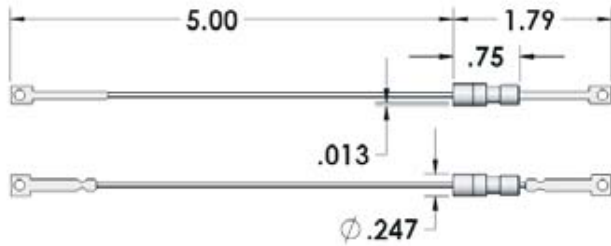
The electrical and thermal ratings specified are safe operating limits determined by various factors including material properties, mechanical design, and the intended operating environment. All electrical ratings are based on operation with one side in dry atmosphere and the other side in vacuum of 1×10^{-4} Torr maximum pressure. Temperature ratings for various mounting options may reduce the operating range of an assembly. All assemblies have a maximum thermal gradient of 25°C per minute and may be damaged if this limit is exceeded.



1 Pair Screw and Nut Connections Single Leg T/C Pairs

Air and Vacuum-side Connectors Included

WELDABLE

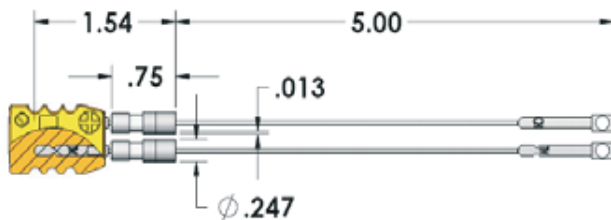


TYPE	PART #
K	A0802-1-W
C	A0802-2-W
J	A0802-3-W
E	A0802-4-W

Miniature Connector Single Leg T/C Pairs

Air and Vacuum-side Connectors Included

WELDABLE



TYPE	PART #
K	A0636-1-W
C	A0636-2-W
J	A0636-3-W
E	A0636-4-W

See Section 7 for connectors, wiring, and other accessories.





1 to 3 Pairs — Connector Fitted

Air and Vacuum-side Connectors Included

WELDABLE

Fig. 1

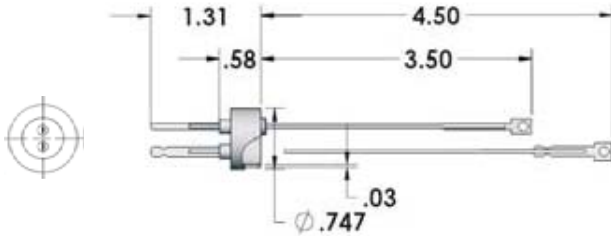


Fig. 2

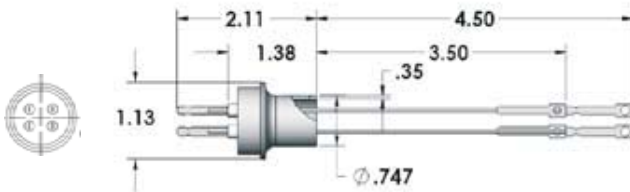
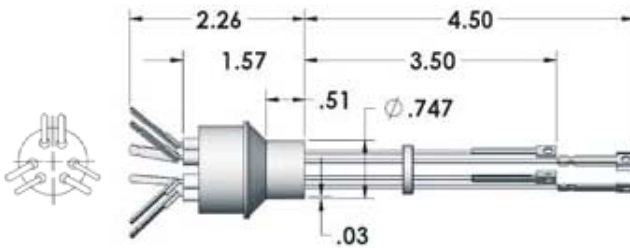


Fig. 3



# PAIRS	TYPE	FIG	PART #
1	C	1	A0389-1-W
1	E	1	A0390-1-W
1	J	1	A0387-1-W
1	K	1	A0388-1-W
2	C	2	A0406-3-W
2	E	2	A0406-4-W
2	J	2	A0406-1-W
2	K	2	A0406-2-W
3	C	3	A0661-4-W
3	E	3	A0661-3-W
3	J	3	A0661-2-W
3	K	3	A0661-1-W

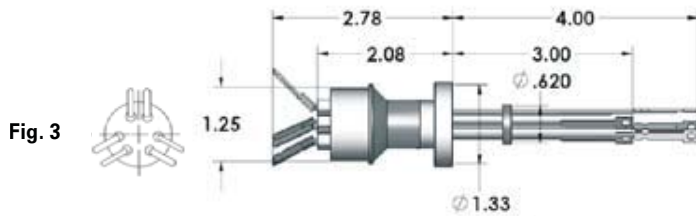
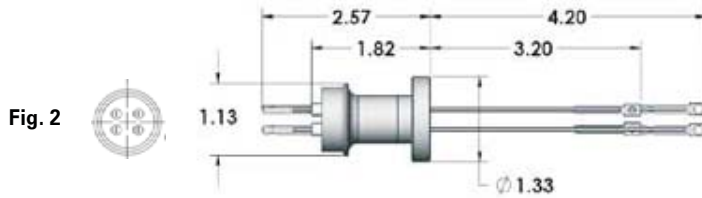
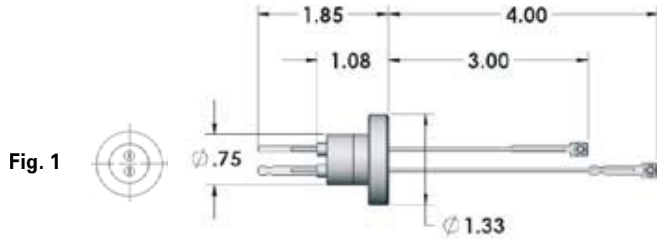
See Section 7 for connectors, wiring, and other accessories.



1 to 3 Pairs — Connector Fitted

Air and Vacuum-side Connectors Included

CONFLAT FLANGE



# PAIRS	TYPE	FIG	PART #	
			CF16 / 1.33	CF40 / 2.75
				<i>(NOT SHOWN)</i>
1	C	1	A0391-3-CF	A2288-3-CF
1	E	1	A0391-4-CF	A2288-4-CF
1	J	1	A0391-1-CF	A2288-1-CF
1	K	1	A0391-2-CF	A2288-2-CF
2	C	2	A0407-3-CF	A2612-3-CF
2	E	2	A0407-4-CF	A2612-4-CF
2	J	2	A0407-1-CF	A2612-1-CF
2	K	2	A0407-2-CF	A2612-2-CF
3	C	3	A0734-4-CF	A5775-3-CF
3	E	3	A0734-3-CF	A5775-4-CF
3	J	3	A0734-2-CF	A5775-1-CF
3	K	3	A0734-1-CF	A5775-2-CF

See Section 7 for connectors, wiring, and other accessories.

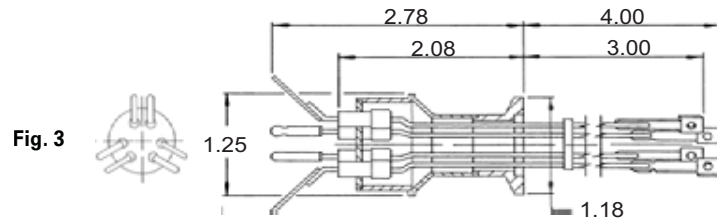
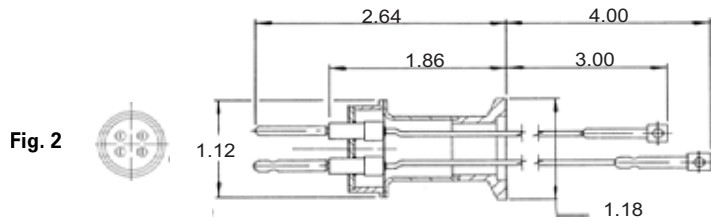
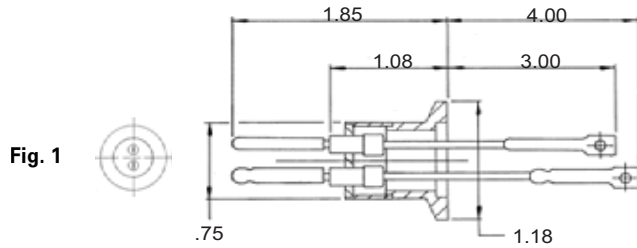




1 to 3 Pairs — Connector Fitted

Air and Vacuum-side Connectors Included

QUICK FLANGE



# PAIRS	TYPE	FIG	PART #
1	C	1	A0392-3-QF
1	E	1	A0392-4-QF
1	J	1	A0392-1-QF
1	K	1	A0392-2-QF
2	C	2	A0408-3-QF
2	E	2	A0408-4-QF
2	J	2	A0408-1-QF
2	K	2	A0408-2-QF
3	C	3	A0782-4-QF
3	E	3	A0782-3-QF
3	J	3	A0782-2-QF
3	K	3	A0782-1-QF

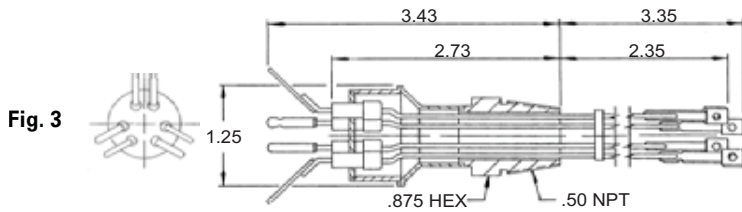
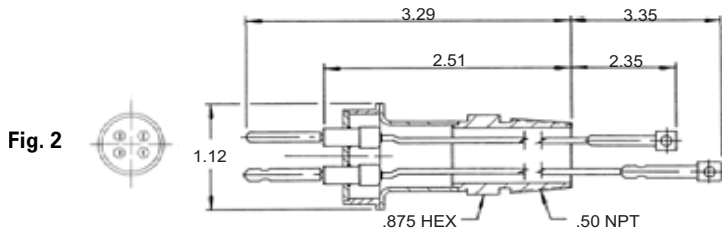
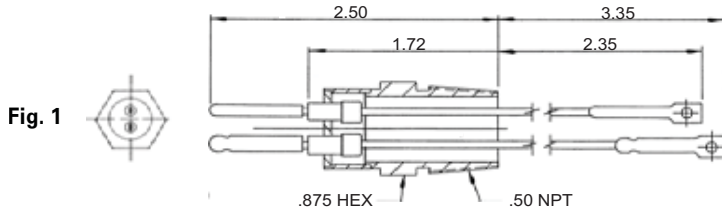
See Section 7 for connectors, wiring, and other accessories.



1 to 3 Pairs — Connector Fitted

Air and Vacuum-side Connectors Included

NPT PIPE THREAD

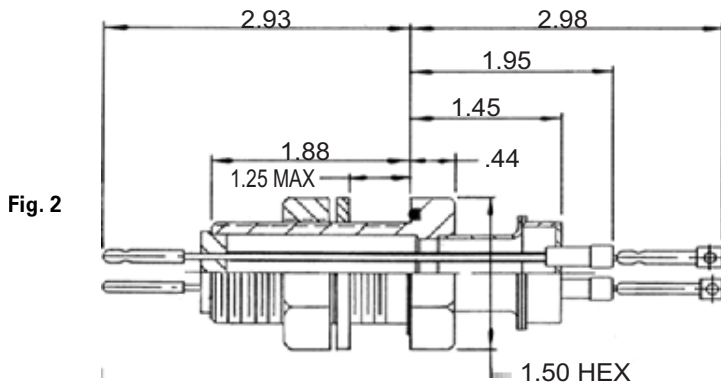
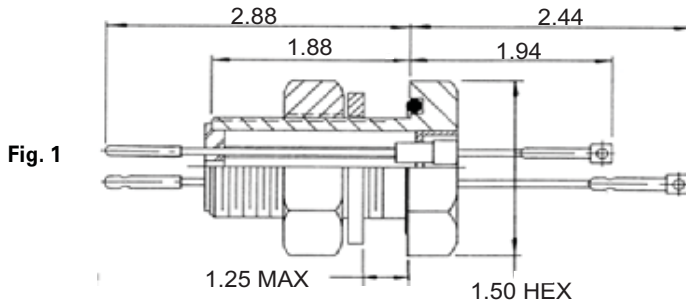


# PAIRS	TYPE	FIG	PART #
1	C	1	A0393-3-NPT
1	E	1	A0393-4-NPT
1	J	1	A0393-1-NPT
1	K	1	A0393-2-NPT
2	C	2	A0409-3-NPT
2	E	2	A0409-4-NPT
2	J	2	A0409-1-NPT
2	K	2	A0409-2-NPT
3	C	3	A0786-1-NPT
3	E	3	A0786-2-NPT
3	J	3	A0786-3-NPT
3	K	3	A0786-4-NPT

See Section 7 for connectors, wiring, and other accessories.



1 to 2 Pairs — Connector Fitted
Air and Vacuum-side Connectors Included
1" BASEPLATE BOLT



# PAIRS	TYPE	FIG	PART #
1	C	1	A0418-3-BP
1	E	1	A0418-4-BP
1	J	1	A0418-1-BP
1	K	1	A0418-2-BP
2	C	2	A0785-3-BP
2	E	2	A0785-4-BP
2	J	2	A0785-1-BP
2	K	2	A0785-2-BP

See Section 7 for connectors, wiring, and other accessories.

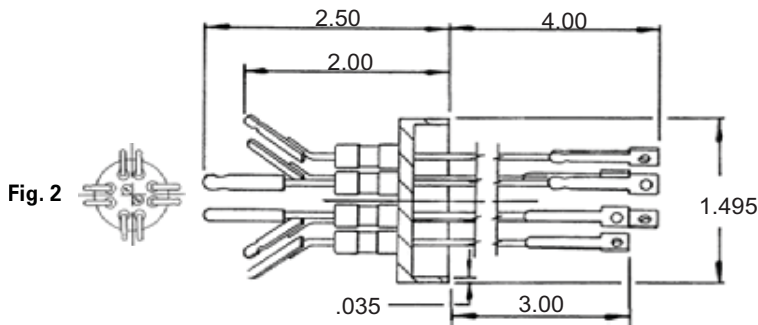
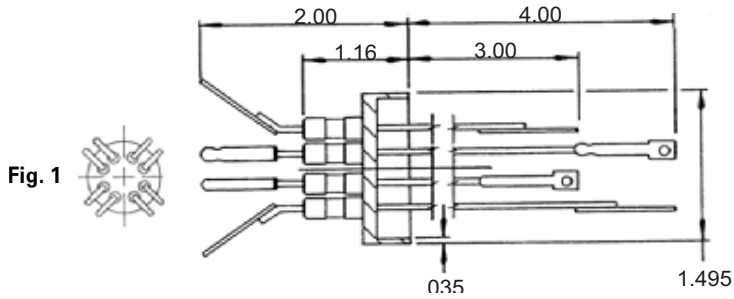




4 to 5 Pairs — Connector Fitted

Air and Vacuum-side Connectors Included

WELDABLE



# PAIRS	TYPE	FIG	PART #
4	C	1	A0720-4-W
4	E	1	A0720-3-W
4	J	1	A0720-2-W
4	K	1	A0720-1-W
5	C	2	A0656-3-W
5	E	2	A0656-4-W
5	J	2	A0656-2-W
5	K	2	A0656-1-W

See Section 7 for connectors, wiring, and other accessories.

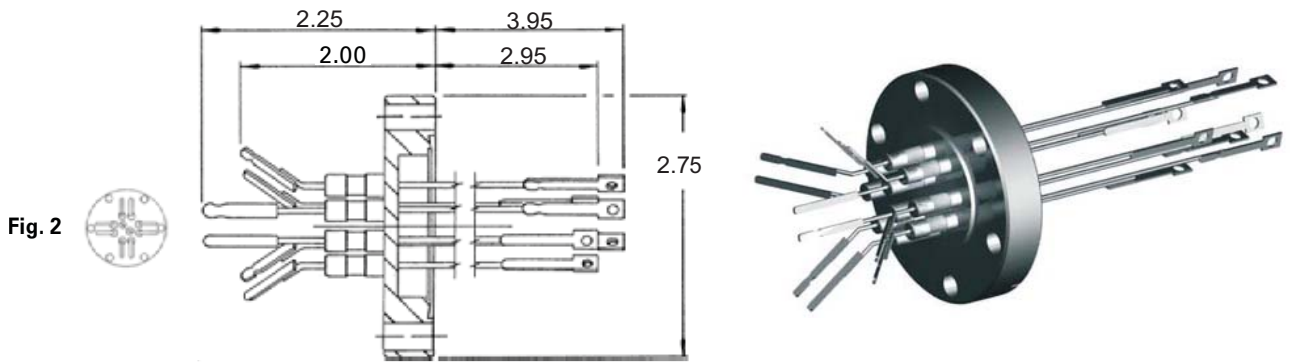
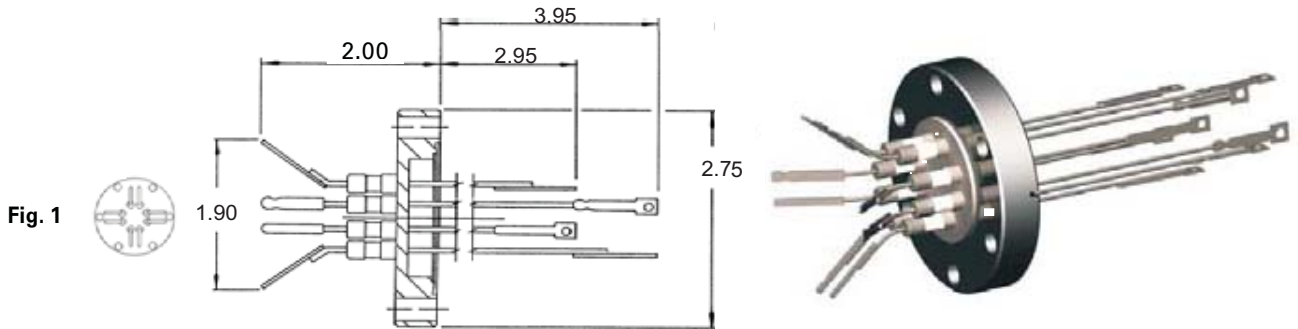




4 to 5 Pairs — Connector Fitted

Air and Vacuum-side Connectors Included

CONFLAT FLANGE



# PAIRS	TYPE	FIG	PART #
4	C	1	A0462-3-CF
4	E	1	A0462-4-CF
4	J	1	A0462-2-CF
4	K	1	A0462-1-CF
5	C	2	A0459-3-CF
5	E	2	A0459-4-CF
5	J	2	A0459-2-CF
5	K	2	A0459-1-CF

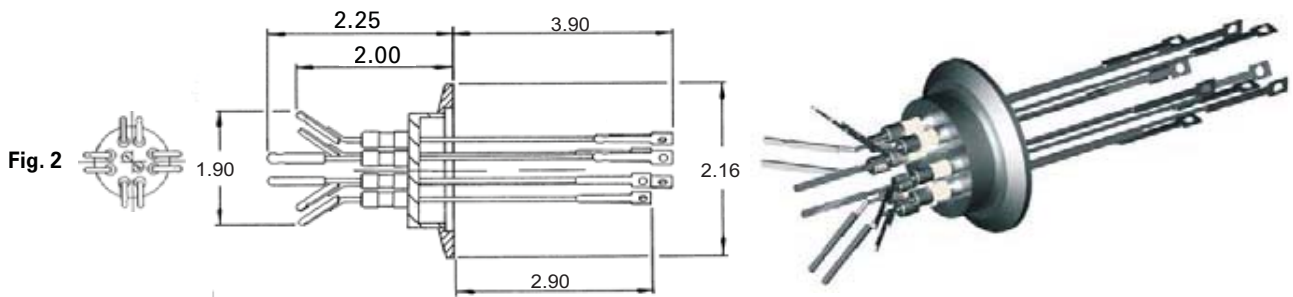
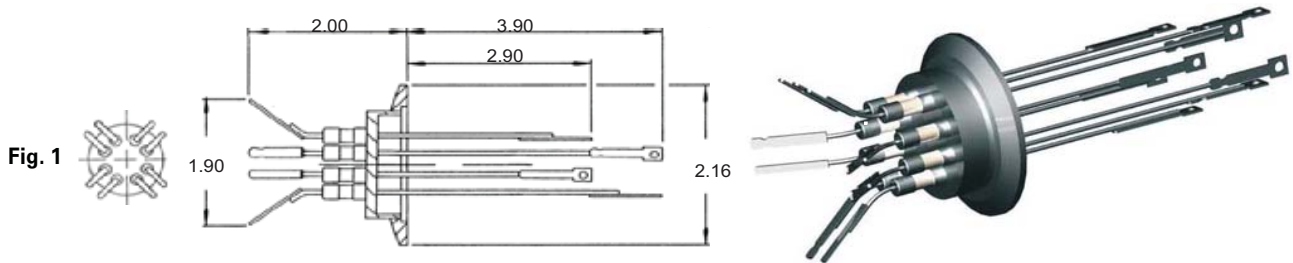
See Section 7 for connectors, wiring, and other accessories.



4 to 5 Pairs — Connector Fitted

Air and Vacuum-side Connectors Included

QUICK FLANGE



# PAIRS	TYPE	FIG	PART #
4	C	1	A0784-1-QF
4	E	1	A0784-2-QF
4	J	1	A0784-3-QF
4	K	1	A0784-4-QF
5	C	2	A0783-3-QF
5	E	2	A0783-4-QF
5	J	2	A0783-2-QF
5	K	2	A0783-1-QF

See Section 7 for connectors, wiring, and other accessories.





1 to 3 Pairs — Screw-type Connection

Air and Vacuum-side Connectors Included

WELDABLE

Fig. 1

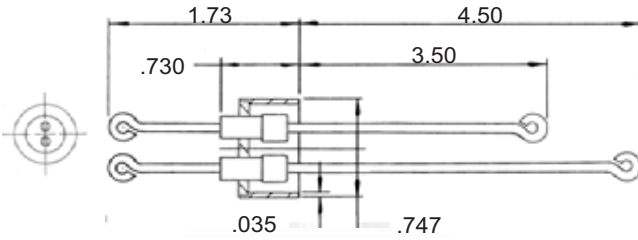


Fig. 2

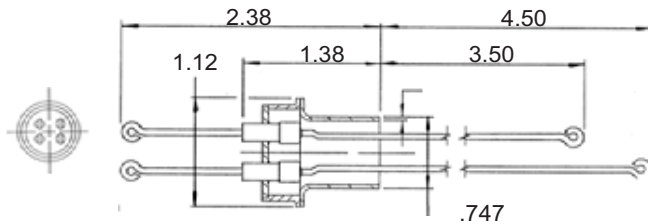
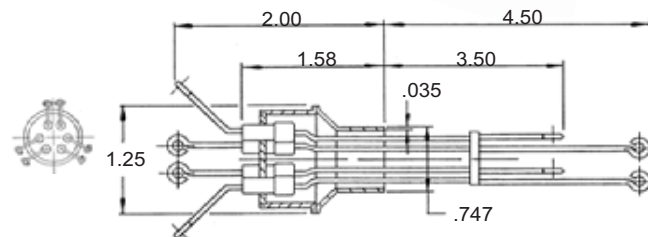


Fig. 3



# PAIRS	TYPE	FIG	PART #
1	R, S	1	A0396-1-W
1	N	1	A0397-3-W
1	T	1	A0397-1-W
2	R, S	2	A0411-2-W
2	N	2	A0411-3-W
2	T	2	A0411-1-W
3	R, S	3	A0787-2-W
3	N	3	A0787-3-W
3	T	3	A0787-1-W

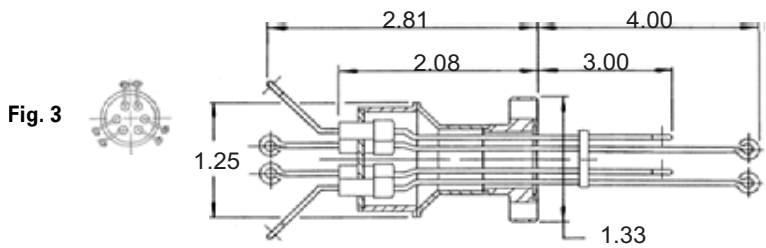
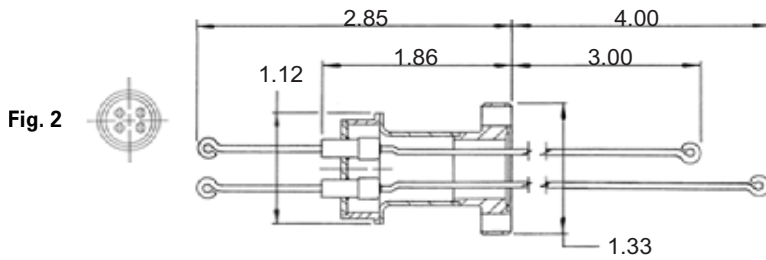
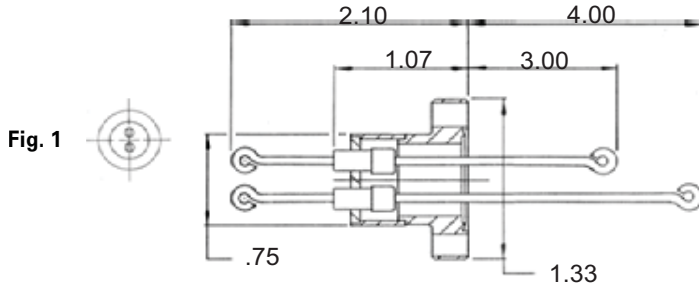
See Section 7 for connectors, wiring, and other accessories.



1 to 3 Pairs — Screw-type Connection

Air and Vacuum-side Connectors Included

CONFLAT FLANGE



# PAIRS	TYPE	FIG	PART #
1	R, S	1	A0399-2-CF
1	N	1	A0399-4-CF
1	T	1	A0399-1-CF
2	R, S	2	A0412-2-CF
2	N	2	A0412-3-CF
2	T	2	A0412-1-CF
3	R, S	3	A0791-2-CF
3	N	3	A0791-3-CF
3	T	3	A0791-1-CF

See Section 7 for connectors, wiring, and other accessories.

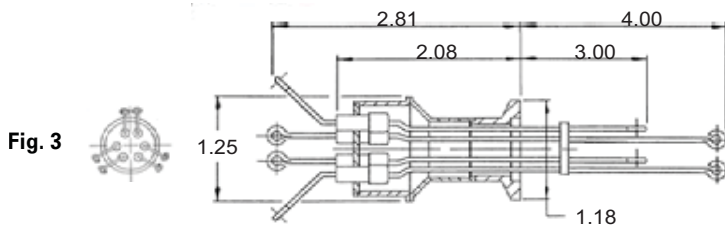
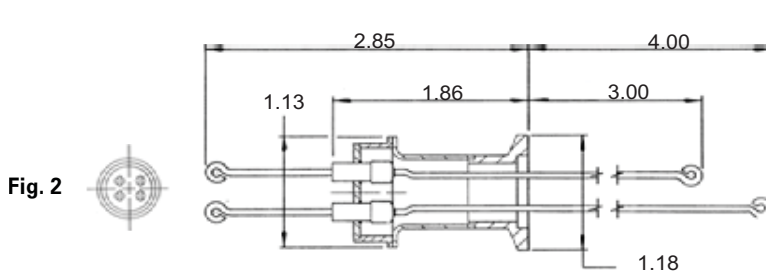
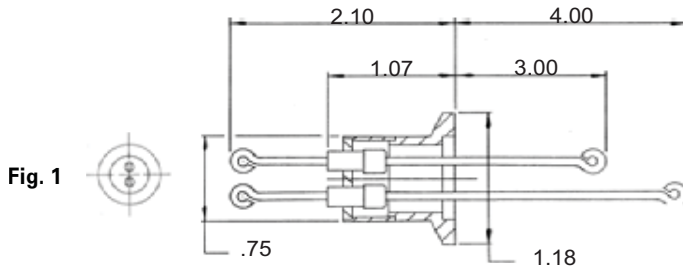




1 to 3 Pairs — Screw-type Connection

Air and Vacuum-side Connectors Included

QUICK FLANGE



# PAIRS	TYPE	FIG	PART #
1	R, S	1	A0400-2-QF
1	N	1	A0400-3-QF
1	T	1	A0400-1-QF
2	R, S	2	A0413-2-QF
2	N	2	A0413-3-QF
2	T	2	A0413-1-QF
3	R, S	3	A0792-2-QF
3	N	3	A0792-3-QF
3	T	3	A0792-1-QF

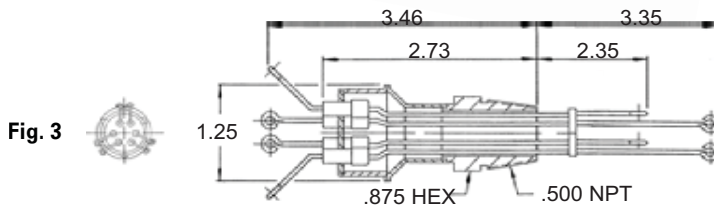
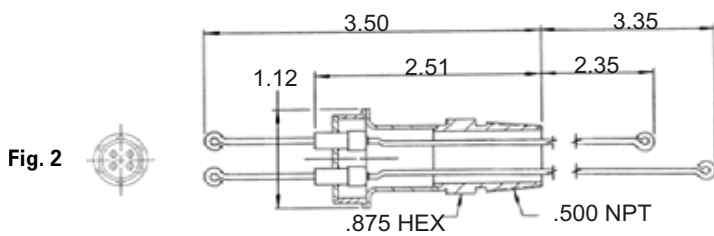
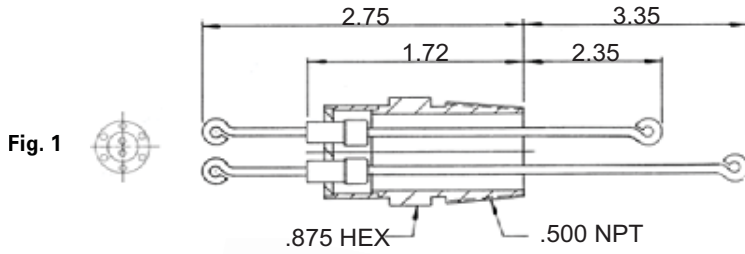
See Section 7 for connectors, wiring, and other accessories.



1 to 3 Pairs — Screw-type Connection

Air and Vacuum-side Connectors Included

NPT PIPE THREAD



# PAIRS	TYPE	FIG	PART #
1	R, S	1	A0401-2-NPT
1	N	1	A0401-3-NPT
1	T	1	A0401-1-NPT
2	R, S	2	A0414-2-NPT
2	N	2	A0414-3-NPT
2	T	2	A0414-1-NPT
3	R, S	3	A0793-2-NPT
3	N	3	A0793-3-NPT
3	T	3	A0793-1-NPT

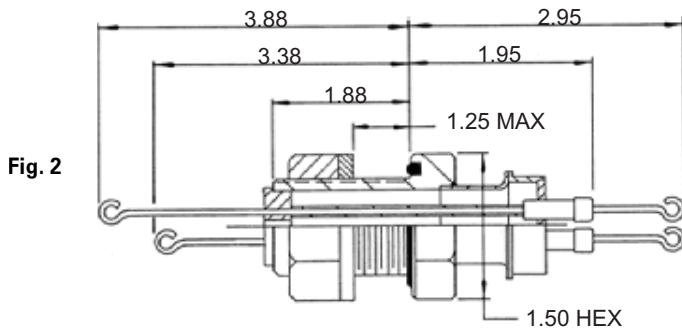
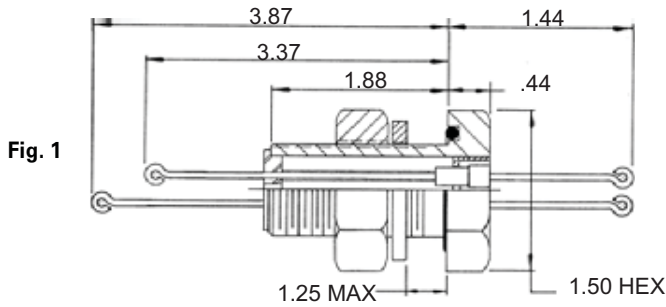
See Section 7 for connectors, wiring, and other accessories.



1 to 2 Pairs — Screw-type Connection

Air and Vacuum-side Connectors Included

1" BASEPLATE



# PAIRS	TYPE	FIG	PART #
1	R, S	1	A0419-2-BP
1	N	1	A0419-3-BP
1	T	1	A0419-1-BP
2	R, S	2	A0446-2-BP
2	N	2	A0446-3-BP
2	T	2	A0446-1-BP

See Section 7 for connectors, wiring, and other accessories.

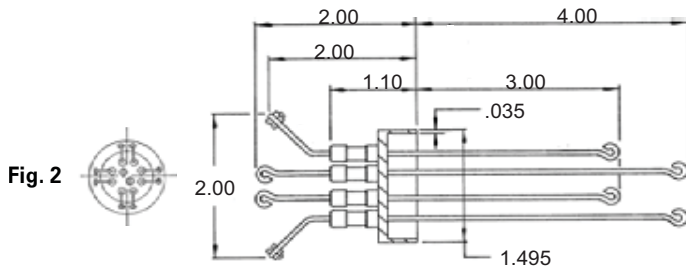
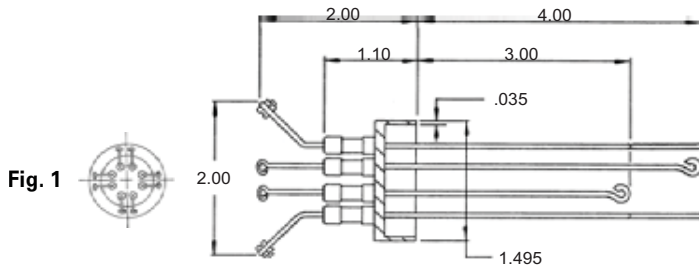




4 to 5 Pairs — Screw-type Connection

Air and Vacuum-side Connectors Included

WELDABLE



# PAIRS	TYPE	FIG	PART #
4	R, S	1	A0788-2-W
4	N	1	A0788-3-W
4	T	1	A0788-1-W
5	R, S	2	A0789-2-W
5	N	2	A0789-3-W
5	T	2	A0789-1-W

See Section 7 for connectors, wiring, and other accessories.

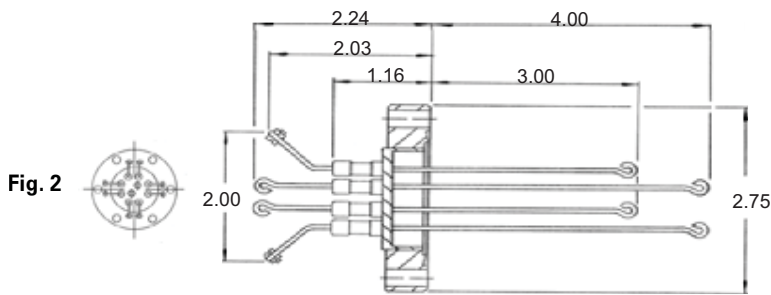
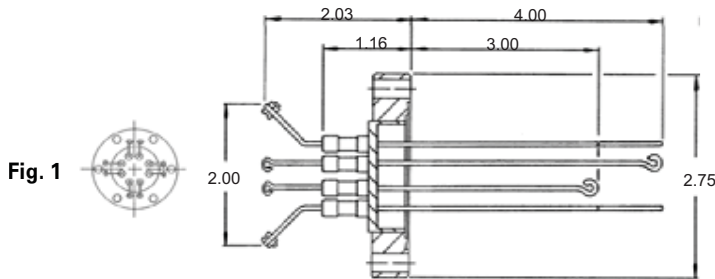




4 to 5 Pairs — Screw-type Connection

Air and Vacuum-side Connectors Included

CONFLAT FLANGE



# PAIRS	TYPE	FIG	PART #
4	R, S	1	A0795-2-CF
4	N	1	A0795-3-CF
4	T	1	A0795-1-CF
5	R, S	2	A0797-2-CF
5	N	2	A0797-3-CF
5	T	2	A0797-1-CF

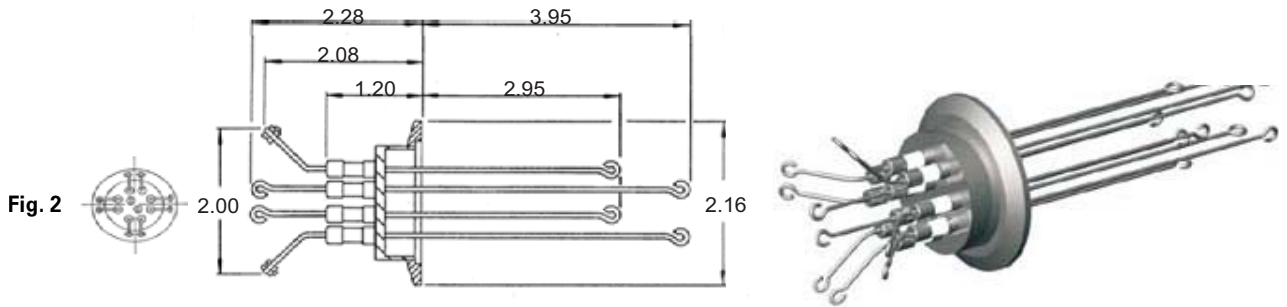
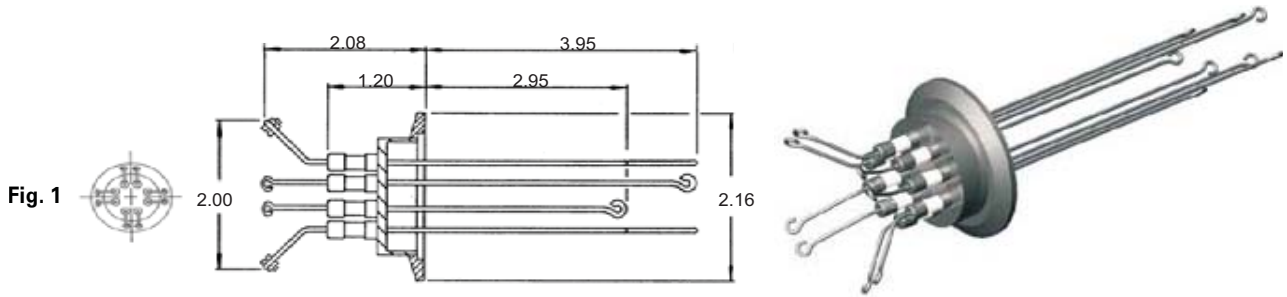
See Section 7 for connectors, wiring, and other accessories.



4 to 5 Pairs — Screw-type Connection

Air and Vacuum-side Connectors Included

QUICK FLANGE



# PAIRS	TYPE	FIG	PART #
4	R, S	1	A0796-2-QF
4	N	1	A0796-3-QF
4	T	1	A0796-1-QF
5	R, S	2	A0794-2-QF
5	N	2	A0794-3-QF
5	T	2	A0794-1-QF

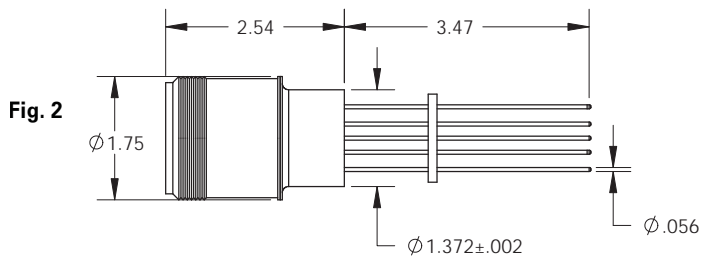
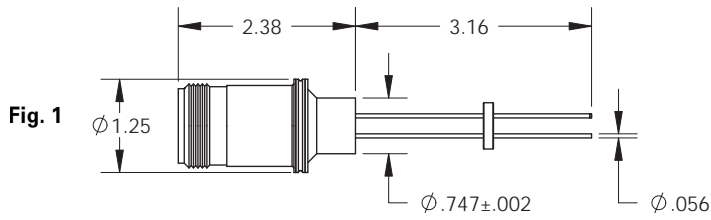
See Section 7 for connectors, wiring, and other accessories.



2 to 10 Pairs — MS Connectors Single-ended

Air-side Connector Included

WELDABLE



# PAIRS	TYPE	FIG	PART #
2	E	1	A0429-3-W
2	J	1	A0429-2-W
2	K	1	A0429-1-W
3	E	1	A0429-7-W
3	J	1	A0429-6-W
3	K	1	A0429-5-W
5	E	1	A0429-11-W
5	J	1	A0429-10-W
5	K	1	A0429-9-W
10	E	2	A0204-3-W
10	J	2	A0204-2-W
10	K	2	A0204-1-W

See Section 7 for connectors, wiring, and other accessories.



2 to 10 Pairs — MS Connectors Single-ended

Air side connectors included

CONFLAT FLANGE

Fig. 1

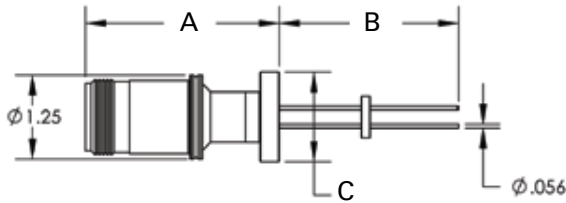
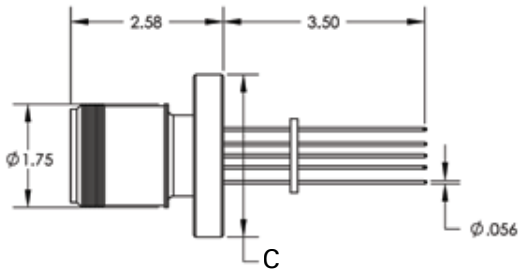


Fig. 2



# PAIRS	TYPE	FIG	A	B	C	PART #
2	E	1	2.80	2.70	1.33	A0192-3-CF
2	J	1	2.80	2.70	1.33	A0192-2-CF
2	K	1	2.80	2.70	1.33	A0192-1-CF
2	E	1	2.30	3.20	2.75	A0193-3-CF
2	J	1	2.30	3.20	2.75	A0193-2-CF
2	K	1	2.30	3.20	2.75	A0193-1-CF
3	E	1	2.80	2.70	1.33	A0192-7-CF
3	J	1	2.80	2.70	1.33	A0192-6-CF
3	K	1	2.80	2.70	1.33	A0192-5-CF
3	E	1	2.30	3.20	2.75	A0193-7-CF
3	J	1	2.30	3.20	2.75	A0193-6-CF
3	K	1	2.30	3.20	2.75	A0193-5-CF
5	E	1	2.80	2.70	1.33	A0192-11-CF
5	J	1	2.80	2.70	1.33	A0192-10-CF
5	K	1	2.80	2.70	1.33	A0192-9-CF
5	E	1	2.30	3.20	2.75	A0193-11-CF
5	J	1	2.30	3.20	2.75	A0193-10-CF
5	K	1	2.30	3.20	2.75	A0193-9-CF
10	E	2	---	---	2.75	A0206-3-CF
10	J	2	---	---	2.75	A0206-2-CF
10	K	2	---	---	2.75	A0206-1-CF

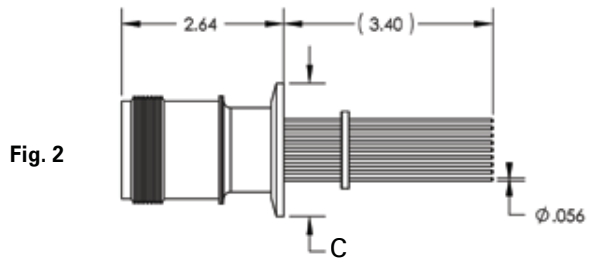
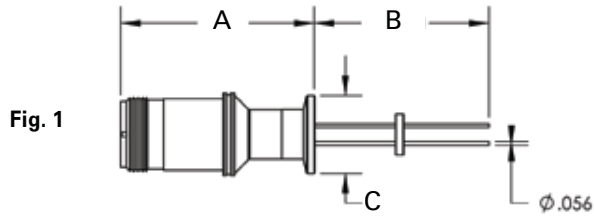
See Section 7 for connectors, wiring, and other accessories.



2 to 10 Pairs — MS Connectors Single-ended

Air side connectors included

QUICK FLANGE



# PAIRS	TYPE	FIG	A	B	C	PART #
2	E	1	2.80	2.70	1.18	A0197-3-QF
2	J	1	2.80	2.70	1.18	A0197-2-QF
2	K	1	2.80	2.70	1.18	A0197-1-QF
2	E	1	2.30	3.20	2.16	A0194-3-QF
2	J	1	2.30	3.20	2.16	A0194-2-QF
2	K	1	2.30	3.20	2.16	A0194-1-QF
3	E	1	2.80	2.70	1.18	A0197-7-QF
3	J	1	2.80	2.70	1.18	A0197-6-QF
3	K	1	2.80	2.70	1.18	A0197-5-QF
3	E	1	2.30	3.20	2.16	A0194-7-QF
3	J	1	2.30	3.20	2.16	A0194-6-QF
3	K	1	2.30	3.20	2.16	A0194-5-QF
5	E	1	2.80	2.70	1.18	A0197-11-QF
5	J	1	2.80	2.70	1.18	A0197-10-QF
5	K	1	2.80	2.70	1.18	A0197-9-QF
5	E	1	2.30	3.20	2.16	A0194-11-QF
5	J	1	2.30	3.20	2.16	A0194-10-QF
5	K	1	2.30	3.20	2.16	A0194-9-QF
10	E	2	---	---	2.16	A0209-3-QF
10	J	2	---	---	2.16	A0209-2-QF
10	K	2	---	---	2.16	A0209-1-QF

See Section 7 for connectors, wiring, and other accessories.





2 to 10 Pairs — MS Connectors Double-ended

Air and Vacuum-side Connectors Included

WELDABLE

Fig. 1

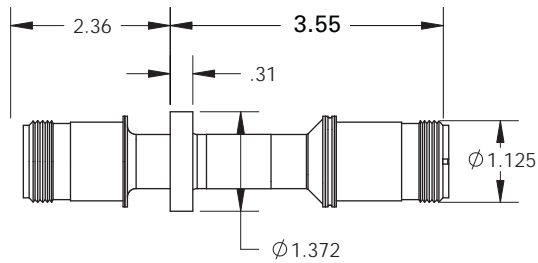
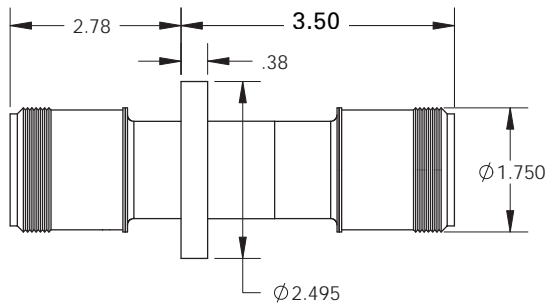


Fig. 2



# PAIRS	TYPE	FIG	PART #
2	E	1	A1149-1-W
2	J	1	A1092-1-W
2	K	1	A1074-1-W
3	E	1	A1093-1-W
3	J	1	A1094-1-W
3	K	1	A1095-1-W
5	E	1	A1147-1-W
5	J	1	A1096-1-W
5	K	1	A1148-1-W
10	E	2	A1097-1-W
10	J	2	A1179-1-W
10	K	2	A1180-1-W

See Section 7 for connectors, wiring, and other accessories.





2 to 10 Pairs — MS Connectors Double-ended

Air and Vacuum-side Connectors Included

CONFLAT FLANGE

Fig. 1

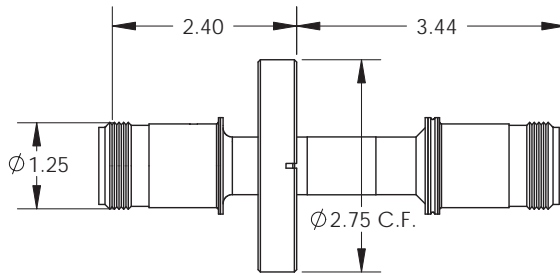
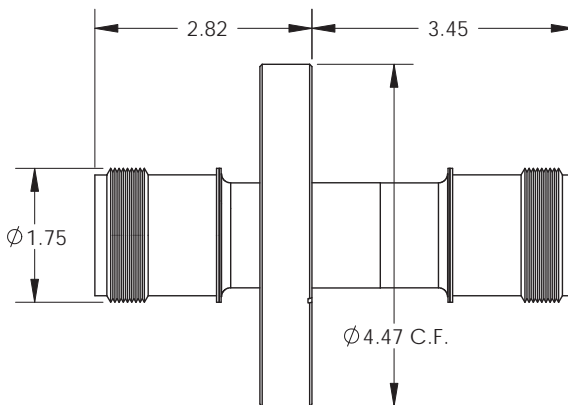


Fig. 2



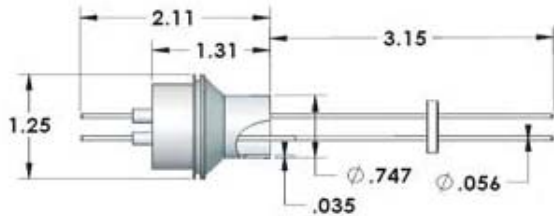
# PAIRS	TYPE	FIG	PART #
2	E	1	A1323-1-CF
2	J	1	A1323-2-CF
2	K	1	A1323-3-CF
3	E	1	A1324-1-CF
3	J	1	A1324-2-CF
3	K	1	A1324-3-CF
5	E	1	A1320-1-CF
5	J	1	A1320-2-CF
5	K	1	A1320-3-CF
10	E	2	A1325-1-CF
10	J	2	A1325-2-CF
10	K	2	A1325-3-CF

See Section 7 for connectors, wiring, and other accessories.



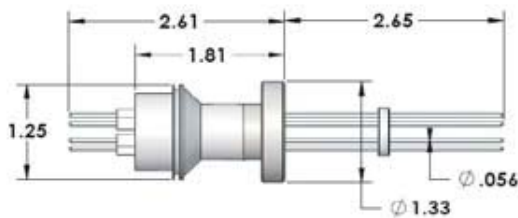


2 to 5 Pairs — Push-on Connectors WELDABLE



# PAIRS	TYPE	PART #
2	E	A0421-3-W
2	J	A0421-2-W
2	K	A0421-1-W
3	E	A0422-3-W
3	J	A0422-2-W
3	K	A0422-1-W
5	E	A0184-3-W
5	J	A0184-2-W
5	K	A0184-1-W

2 to 5 Pairs — Push-on Connectors CONFLAT FLANGE



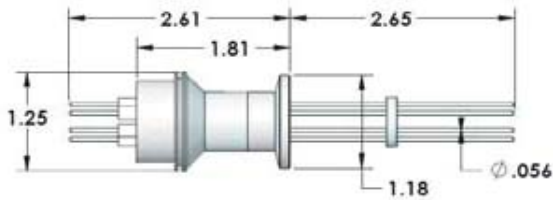
# PAIRS	TYPE	PART #
2	E	A0423-3-CF
2	J	A0423-2-CF
2	K	A0423-1-CF
3	E	A0423-7-CF
3	J	A0423-6-CF
3	K	A0423-5-CF
5	E	A0423-11-CF
5	J	A0423-10-CF
5	K	A0423-9-CF

See Section 7 for connectors, wiring, and other accessories.



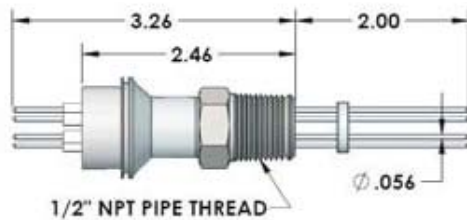


2 to 5 Pairs — Push-on Connectors
QUICK FLANGE



# PAIRS	TYPE	PART #
2	E	A0425-3-QF
2	J	A0425-2-QF
2	K	A0425-1-QF
3	E	A0425-7-QF
3	J	A0425-6-QF
3	K	A0425-5-QF
5	E	A0425-11-QF
5	J	A0425-10-QF
5	K	A0425-9-QF

2 to 5 Pairs — Push-on Connectors
NPT PIPE THREAD



# PAIRS	TYPE	PART #
2	E	A0424-3-NPT
2	J	A0424-2-NPT
2	K	A0424-1-NPT
3	E	A0424-7-NPT
3	J	A0424-6-NPT
3	K	A0424-5-NPT
5	E	A0424-11-NPT
5	J	A0424-10-NPT
5	K	A0424-9-NPT

See Section 7 for connectors, wiring, and other accessories.



1 T/C Pair & 1 Power Pair T/C Connectors

Air and vacuum side connectors for T/C included

WELDABLE

Fig. 1

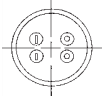
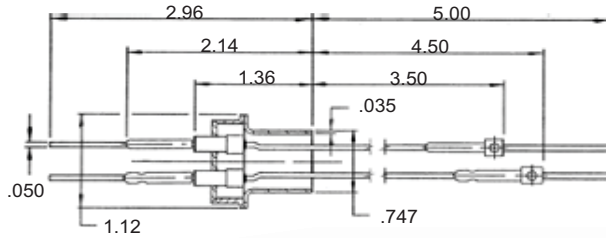
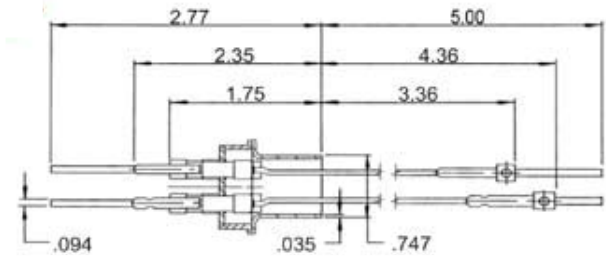


Fig. 2



AMPS	TYPE	VOLTAGE	FIG	CONDUCTOR	PART #
15	C	1KV	1	COPPER	A0434-5-W
15	E	1KV	1	COPPER	A0434-7-W
15	J	1KV	1	COPPER	A0434-3-W
15	K	1KV	1	COPPER	A0434-1-W
5	C	1KV	1	NICKEL	A0434-6-W
5	E	1KV	1	NICKEL	A0434-8-W
5	J	1KV	1	NICKEL	A0434-4-W
5	K	1KV	1	NICKEL	A0434-2-W
30	C	5KV	2	COPPER	A0442-5-W
30	E	5KV	2	COPPER	A0442-7-W
30	J	5KV	2	COPPER	A0442-3-W
30	K	5KV	2	COPPER	A0442-1-W
15	C	5KV	2	NICKEL	A0442-6-W
15	E	5KV	2	NICKEL	A0442-8-W
15	J	5KV	2	NICKEL	A0442-4-W
15	K	5KV	2	NICKEL	A0442-2-W

See Section 7 for connectors, wiring, and other accessories.



1 T/C Pair & 1 Power Pair T/C Connectors

Air and vacuum side connectors for T/C included

CONFLAT FLANGE

Fig. 1

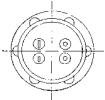
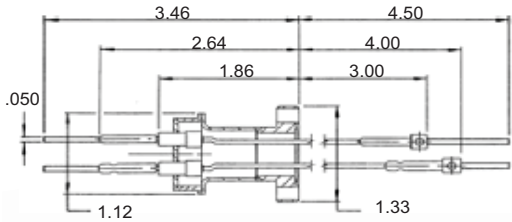
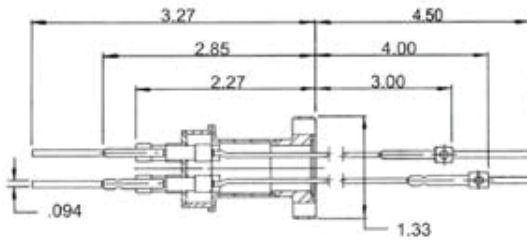


Fig. 2



AMPS	TYPE	VOLTAGE	FIG	CONDUCTOR	PART #	
					CF16 / 1.33	CF40 / 2.75
						(NOT SHOWN)
5	C	1KV	1	NICKEL	A0436-6-CF	A2267-6-CF
5	E	1KV	1	NICKEL	A0436-8-CF	A2267-8-CF
5	J	1KV	1	NICKEL	A0436-4-CF	A2267-4-CF
5	K	1KV	1	NICKEL	A0436-2-CF	A2267-2-CF
15	C	1KV	1	COPPER	A0436-5-CF	A2267-5-CF
15	E	1KV	1	COPPER	A0436-7-CF	A2267-7-CF
15	J	1KV	1	COPPER	A0436-3-CF	A2267-3-CF
15	K	1KV	1	COPPER	A0436-1-CF	A2267-1-CF
15	C	5KV	2	NICKEL	A0443-6-CF	A2277-6-CF
15	E	5KV	2	NICKEL	A0443-8-CF	A2277-8-CF
15	J	5KV	2	NICKEL	A0443-4-CF	A2277-4-CF
15	K	5KV	2	NICKEL	A0443-2-CF	A2277-2-CF
30	C	5KV	2	COPPER	A0443-5-CF	A2277-5-CF
30	E	5KV	2	COPPER	A0443-7-CF	A2277-7-CF
30	J	5KV	2	COPPER	A0443-3-CF	A2277-3-CF
30	K	5KV	2	COPPER	A0443-1-CF	A2277-1-CF

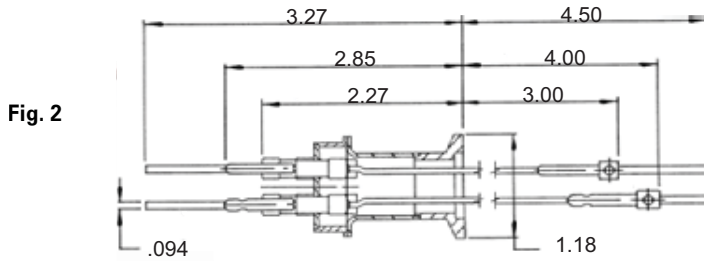
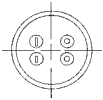
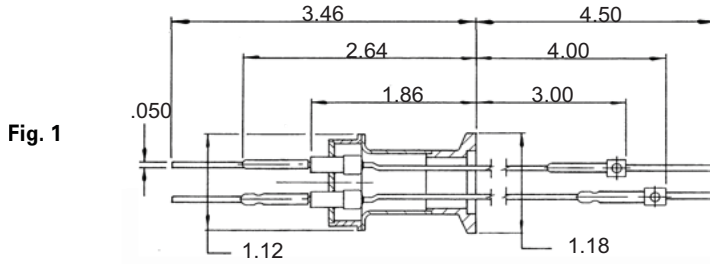
See Section 7 for connectors, wiring, and other accessories.



1 T/C Pair & 1 Power Pair T/C Connectors

Air and vacuum side connectors for T/C included

QUICK FLANGE



AMPS	TYPE	VOLTAGE	FIG	CONDUCTOR	PART #
5	C	1KV	1	NICKEL	A0435-6-QF
5	E	1KV	1	NICKEL	A0435-8-QF
5	J	1KV	1	NICKEL	A0435-4-QF
5	K	1KV	1	NICKEL	A0435-2-QF
15	C	1KV	1	COPPER	A0435-5-QF
15	E	1KV	1	COPPER	A0435-7-QF
15	J	1KV	1	COPPER	A0435-3-QF
15	K	1KV	1	COPPER	A0435-1-QF
15	C	5KV	2	NICKEL	A0444-6-QF
15	E	5KV	2	NICKEL	A0444-8-QF
15	J	5KV	2	NICKEL	A0444-4-QF
15	K	5KV	2	NICKEL	A0444-2-QF
30	C	5KV	2	COPPER	A0444-5-QF
30	E	5KV	2	COPPER	A0444-7-QF
30	J	5KV	2	COPPER	A0444-3-QF
30	K	5KV	2	COPPER	A0444-1-QF

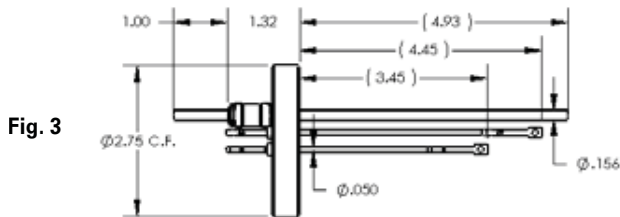
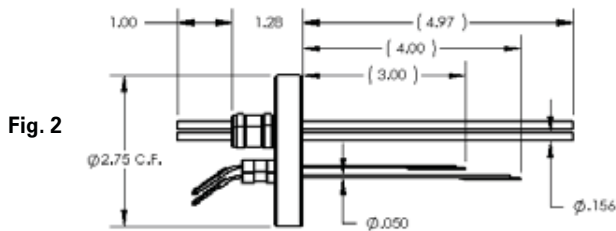
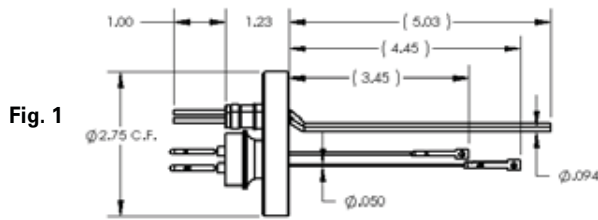
See Section 7 for connectors, wiring, and other accessories.



1 & 2 T/C Pairs & 3 Power Pins T/C Connectors

Air and vacuum side connectors for T/C included

CONFLAT FLANGE



AMPS	TC PAIRS	TYPE	VOLTAGE	FIG	CONDUCTOR	PART #
30	2	C	5KV	1	.094 COPPER	A0451-3-CF
30	2	E	5KV	1	.094 COPPER	A0451-4-CF
30	2	J	5KV	1	.094 COPPER	A0451-1-CF
30	2	K	5KV	1	.094 COPPER	A0451-2-CF
60	1	C	5KV	2	.156 COPPER	A0453-3-CF
60	1	E	5KV	2	.156 COPPER	A0453-4-CF
60	1	J	5KV	2	.156 COPPER	A0453-1-CF
60	1	K	5KV	2	.156 COPPER	A0453-2-CF
60	2	C	5KV	3	.156 COPPER	A0800-3-CF
60	2	E	5KV	3	.156 COPPER	A0800-4-CF
60	2	J	5KV	3	.156 COPPER	A0800-1-CF
60	2	K	5KV	3	.156 COPPER	A0800-2-CF

See Section 7 for connectors, wiring, and other accessories.



1 & 2 T/C Pairs & 1 Power Pair T/C Connectors

Air and vacuum side connectors for T/C included

CONFLAT FLANGE

Fig. 1

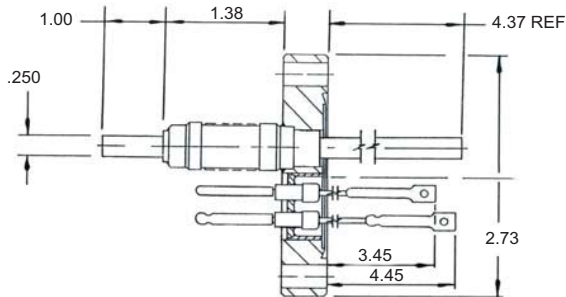
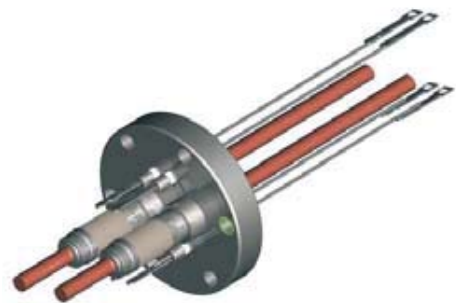
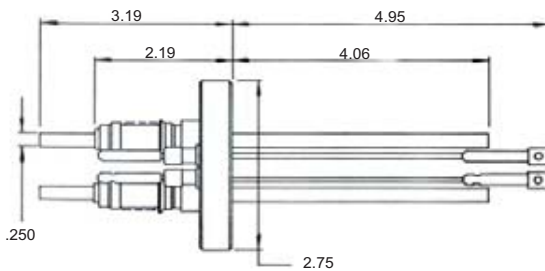


Fig. 2



AMPS	TC PAIRS	TYPE	VOLTAGE	FIG	CONDUCTOR	PART #
150	1	C	5KV	1	.250 COPPER	A0458-3-CF
150	1	E	5KV	1	.250 COPPER	A0458-4-CF
150	1	J	5KV	1	.250 COPPER	A0458-1-CF
150	1	K	5KV	1	.250 COPPER	A0458-2-CF
150	2	C	5KV	2	.250 COPPER	A0798-2-CF
150	2	E	5KV	2	.250 COPPER	A0798-4-CF
150	2	J	5KV	2	.250 COPPER	A0798-3-CF
150	2	K	5KV	2	.250 COPPER	A0798-1-CF

See Section 7 for connectors, wiring, and other accessories.



POWER

Power is the description for electrical feedthroughs used for the transmission of high voltages and/or high current into vacuum systems. Power feedthrough options include many variations of design which offer a broad range of voltage and current. High purity alumina ceramic insulators provide electrical isolation and various conductor materials offer specific current capacities.

MPF offers several mounting options for power feedthroughs: Weldable, Quick Flange (QF), Conflat Flange (CF), and Baseplate (BP). Baseplate versions of power feedthroughs are commonly used in vacuum furnaces and vacuum coating applications. Many designs are also configured for NPT style adapters. Custom adapters, plates and flange configurations are available by request.

High Voltage and High Current

The voltage rating for feedthroughs is determined by the length of the ceramic insulator, or the surface distance in the case of fluted designs. MPF offers power feedthroughs with voltage ratings up to 60,000 Volts DC.

The current rating for feedthroughs is dependent on the conductor material. The choice of which must consider other factors such as strength and corrosion resistance. Copper gives the best current capacity, while stainless steel offers high strength and resistance to corrosion. Nickel, Alumel and Molybdenum are other popular conductor materials. MPF offers power feedthroughs with current ratings to 1000 Amps.



Water-cooled and RF Power

Water-cooled feedthroughs are intended for use with grounded, closed-loop cooling systems and non-conductive coolants such as deionized water. Standard conductor options for these feedthroughs include copper, nickel and stainless tubes. Water-cooled feedthroughs are rated for up to 8000 Volts DC and up to 1000 Amps.

RF Power Feedthroughs are specifically designed for the transmission of Radio Frequency power into the vacuum environment. Non-magnetic materials are used in RF feedthroughs to reduce current induction. RF Feedthroughs are rated up to 3000 Volts DC and up to 1000 Amps.



Power Glove Connectors

MPF offers the Power Glove series of high voltage feedthroughs which includes an air-side connector / cable (96 inches) for safe and convenient termination of high voltage and high current leads.

Power Glove fitted feedthroughs are rated up to 20,000 Volts DC and up to 30 Amps.



Power

Section 4: Contents

Section	Type	Electrical Rating	Thermal Rating	Pages
4.1	Low Power 1, 2, 4 and 8 pins	Voltage: 500 to 1000 Volts DC Current: to 25 Amps per pin	Feedthrough: -100 to 450°C	78-82
4.2	Medium Power 4, 6 and 10 pins	Voltage: 2000 Volts DC Current: 10 Amps per pin	Feedthrough: -100 to 450°C	83-84
4.3	Medium Power Baseplate 1, 2, 3 and 4 pins	Voltage: 2000 Volts DC Current: 50 Amps per pin	Feedthrough: -20 to 150°C	85
4.4	High Power 1, 2, 3, 4, 8 and 12 pins	Voltage: 5000 to 8000 Volts DC Current: to 800 Amps per pin	Feedthrough: -100 to 450°C	86-95
4.5	High Power Baseplate 1 pin	Voltage: 3000 to 12,000 Volts DC Current: to 250 Amps per pin	Feedthrough: -20 to 150°C	96-97
4.6	High Voltage 1, 2, 3 and 4 pins	Voltage: 10,000 to 60,000 Volts DC Current: to 180 Amps per pin	Feedthrough: -100 to 450°C	98-109
4.7	Water-Cooled 1, 2, 3 and 4 pins	Voltage: to 8000 Volts DC Current: to 1000 Amps per pin	Feedthrough: -100 to 450°C	110-114
4.8	RF Power 1 and 2 pins	Voltage: to 8000 Volts DC Power: to 10 KW at 450 KHz	Feedthrough: -100 to 450°C	115-116
4.9	Power Glove 1, 2 and 4 pins	Voltage: 5000 to 20,000 Volts DC Current: to 30 Amps per pin	Feedthrough: -100 to 450°C Air-side Connector: -55 to 125°C	117-119

Operating Conditions

The electrical and thermal ratings specified are safe operating limits determined by various factors including material properties, mechanical design, and the intended operating environment. All electrical ratings are based on operation with one side in dry atmosphere and the other side in vacuum of 1×10^{-4} Torr maximum pressure. Temperature ratings for various mounting options may reduce the operating range of an assembly. All assemblies have a maximum thermal gradient of 25°C per minute and may be damaged if this limit is exceeded.

500 & 1000 Volts DC / to 25 Amps / 1 to 8 Pins WELDABLE

Fig. 1

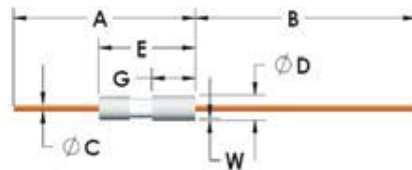
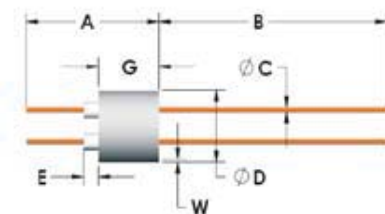


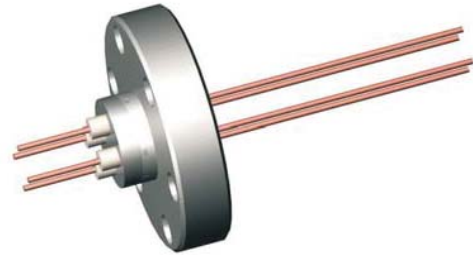
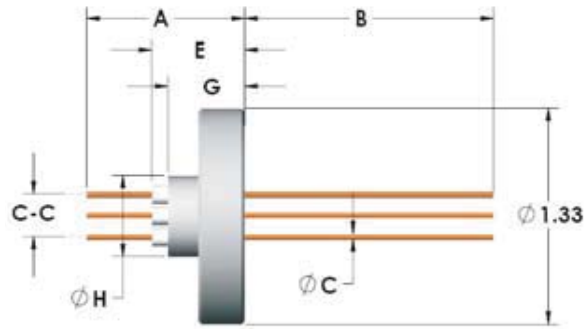
Fig. 2



VOLTS	PINS	AMPS	CONDUCTOR	FIG	A	B	C	D	E	G	W	PART #
500	1	8	MOLY	1	1.10	1.00	.032	.154	.60	.27	.015	A0495-1-W
500	1	15	COPPER	1	1.10	1.00	.032	.154	.60	.27	.015	A0495-2-W
500	1	5	NICKEL	1	1.10	1.00	.032	.154	.60	.27	.015	A0495-3-W
500	1	1	STN STL	1	1.10	1.00	.032	.154	.60	.27	.015	A0495-4-W
500	1	15	COPPER	1	1.10	1.00	.032	.154	.60	.27	.015	A0070-2-W *
500	1	2	CONSTANTAN	1	1.10	1.00	.032	.154	.60	.27	.015	A0070-1-W *
500	1	1	STN STL	1	1.10	1.00	.032	.154	.60	.27	.015	A0070-3-W *
500	2	8	MOLY	2	1.00	1.50	.032	.497	.53	.43	.020	A0078-4-W
500	2	15	COPPER	2	1.00	1.50	.032	.497	.53	.43	.020	A0078-3-W
500	2	5	NICKEL	2	1.00	1.50	.032	.497	.53	.43	.020	A0078-1-W
500	2	1	STN STL	2	1.00	1.50	.032	.497	.53	.43	.020	A0078-2-W
500	4	8	MOLY	2	1.00	1.50	.032	.497	.53	.43	.020	A0086-4-W
500	4	15	COPPER	2	1.00	1.50	.032	.497	.53	.43	.020	A0086-3-W
500	4	5	NICKEL	2	1.00	1.50	.032	.497	.53	.43	.020	A0086-1-W
500	4	1	STN STL	2	1.00	1.50	.032	.497	.53	.43	.020	A0086-2-W
500	8	8	MOLY	2	1.00	1.50	.032	.747	.63	.53	.030	A0089-4-W
500	8	15	COPPER	2	1.00	1.50	.032	.747	.63	.53	.030	A0089-3-W
500	8	5	NICKEL	2	1.00	1.50	.032	.747	.63	.53	.030	A0089-1-W
500	8	1	STN STL	2	1.00	1.50	.032	.747	.63	.53	.030	A0089-2-W
1000	1	25	COPPER	1	1.75	2.25	.050	.247	.75	.37	.015	A0076-3-W
1000	1	8	NICKEL	1	1.75	2.25	.050	.247	.75	.37	.015	A0076-2-W
1000	1	1	STN STL	1	1.75	2.25	.050	.247	.75	.37	.015	A0076-1-W
1000	2	25	COPPER	2	1.75	1.87	.050	.747	.67	.53	.030	A0087-3-W
1000	2	8	NICKEL	2	1.75	1.87	.050	.747	.67	.53	.030	A0087-1-W
1000	2	1	STN STL	2	1.75	1.87	.050	.747	.67	.53	.030	A0087-2-W
1000	4	25	COPPER	2	1.75	1.87	.050	.747	.67	.53	.030	A0088-3-W
1000	4	8	NICKEL	2	1.75	1.87	.050	.747	.67	.53	.030	A0088-1-W
1000	4	1	STN STL	2	1.75	1.87	.050	.747	.67	.53	.030	A0088-2-W
1000	8	25	COPPER	2	1.25	2.75	.050	.747	.67	.53	.030	A0860-3-W
1000	8	8	KOVAR	2	1.25	2.75	.050	.747	.67	.53	.030	A0860-1-W
1000	8	13	MOLY	2	1.25	2.75	.050	.747	.67	.53	.030	A0860-2-W

*Indicates suitable for liquid helium applications (not weldable).

500 & 1000 Volts DC / to 25 Amps / 2 to 8 Pins
CONFLAT FLANGE

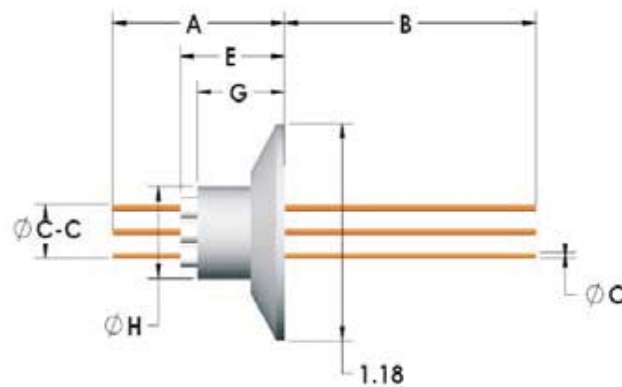


VOLTS	PINS	AMPS	CONDUCTOR	FLANGE	A	B	C	E	G	H	C-C	PART #
500	2	8	MOLY	CF16	.99	1.52	.032	.58	.48	.50	.21	A0496-4-CF
500	2	15	COPPER	CF16	.99	1.52	.032	.58	.48	.50	.21	A0496-3-CF
500	2	5	NICKEL	CF16	.99	1.52	.032	.58	.48	.50	.21	A0496-1-CF
500	2	1	STN STL	CF16	.99	1.52	.032	.58	.48	.50	.21	A0496-2-CF
500	4	8	MOLY	CF16	.99	1.52	.032	.58	.48	.50	.25	A0497-4-CF
500	4	15	COPPER	CF16	.99	1.52	.032	.58	.48	.50	.25	A0497-3-CF
500	4	5	NICKEL	CF16	.99	1.52	.032	.58	.48	.50	.25	A0497-1-CF
500	4	1	STN STL	CF16	.99	1.52	.032	.58	.48	.50	.25	A0497-2-CF
500	8	15	COPPER	CF16	1.53	.97	.032	1.13	1.03	.75	.43	A0266-3-CF
500	8	8	MOLY	CF16	1.53	.97	.032	1.13	1.03	.75	.43	A0266-4-CF
500	8	5	NICKEL	CF16	1.53	.97	.032	1.13	1.03	.75	.43	A0266-1-CF
500	8	1	STN STL	CF16	1.53	.97	.032	1.13	1.03	.75	.43	A0266-2-CF
1000	2	25	COPPER	CF16	2.63	1.37	.050	1.17	1.03	.75	.31	A0261-3-CF
1000	2	8	NICKEL	CF16	2.63	1.37	.050	1.17	1.03	.75	.31	A0261-1-CF
1000	2	1	STN STL	CF16	2.63	1.37	.050	1.17	1.03	.75	.31	A0261-2-CF
1000	4	25	COPPER	CF16	2.63	1.37	.050	1.17	1.03	.75	.38	A0262-3-CF
1000	4	8	NICKEL	CF16	2.63	1.37	.050	1.17	1.03	.75	.38	A0262-1-CF
1000	4	1	STN STL	CF16	2.63	1.37	.050	1.17	1.03	.75	.38	A0262-2-CF
1000	8	25	COPPER	CF16	1.75	3.50	.050	1.25	1.25	.75	.43	A0863-3-CF
1000	8	8	KOVAR	CF16	1.75	3.50	.050	1.25	1.25	.75	.43	A0863-1-CF
1000	8	13	MOLY	CF16	1.75	3.50	.050	1.25	1.25	.75	.43	A0863-2-CF

See Section 7 for connectors, wiring, and other accessories.



500 Volts DC / to 15 Amps / 2 to 8 Pins QUICK FLANGE



PINS	AMPS	CONDUCTOR	FLANGE	A	B	C	E	G	H	C-C	PART #
2	8	MOLY	QF16	1.03	1.47	.032	.63	.53	.50	.21	A0500-4-QF
2	15	COPPER	QF16	1.03	1.47	.032	.63	.53	.50	.21	A0500-3-QF
2	5	NICKEL	QF16	1.03	1.47	.032	.63	.53	.50	.21	A0500-1-QF
2	1	STN STL	QF16	1.03	1.47	.032	.63	.53	.50	.21	A0500-2-QF
4	8	MOLY	QF16	1.03	1.47	.032	.63	.53	.50	.25	A0501-4-QF
4	15	COPPER	QF16	1.03	1.47	.032	.63	.53	.50	.25	A0501-3-QF
4	5	NICKEL	QF16	1.03	1.47	.032	.63	.53	.50	.25	A0501-1-QF
4	1	STN STL	QF16	1.03	1.47	.032	.63	.53	.50	.25	A0501-2-QF
8	15	COPPER	QF16	1.53	.97	.032	1.13	1.03	.75	.43	A0502-3-QF
8	8	MOLY	QF16	1.53	.97	.032	1.13	1.03	.75	.43	A0502-4-QF
8	5	NICKEL	QF16	1.53	.97	.032	1.13	1.03	.75	.43	A0502-1-QF
8	1	STN STL	QF16	1.53	.97	.032	1.13	1.03	.75	.43	A0502-2-QF

See Section 7 for connectors, wiring, and other accessories.



1000 Volts DC / to 25 Amps / 2 to 8 Pins
QUICK FLANGE

Fig. 1

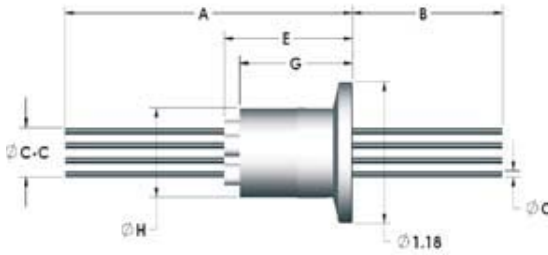
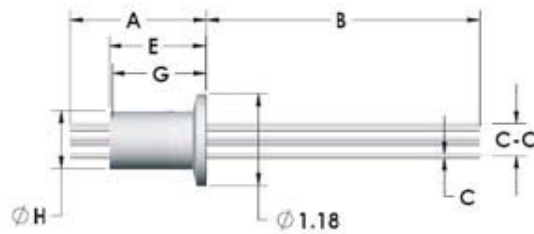


Fig. 2

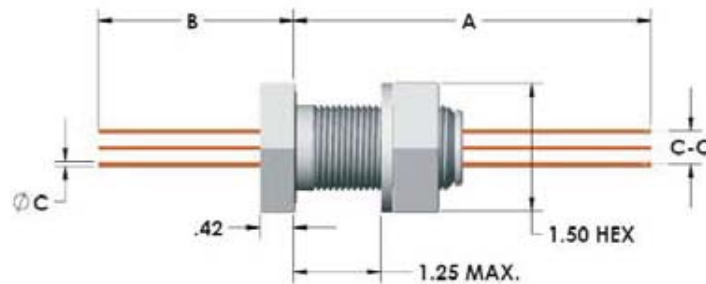


PINS	AMPS	CONDUCTOR	FIG	FLANGE	A	B	C	E	G	H	C-C	PART #
2	25	COPPER	1	QF16	2.63	1.37	.05	1.17	1.03	.75	.31	A0498-3-QF
2	8	NICKEL	1	QF16	2.63	1.37	.05	1.17	1.03	.75	.31	A0498-1-QF
2	1	STN STL	1	QF16	2.63	1.37	.05	1.17	1.03	.75	.31	A0498-2-QF
4	25	COPPER	1	QF16	2.63	1.37	.05	1.17	1.03	.75	.38	A0499-3-QF
4	8	NICKEL	1	QF16	2.63	1.37	.05	1.17	1.03	.75	.38	A0499-1-QF
4	1	STN STL	1	QF16	2.63	1.37	.05	1.17	1.03	.75	.38	A0499-2-QF
8	7	KOVAR	2	QF16	1.75	3.50	.05	1.25	1.25	.75	.43	A2572-1-QF
8	25	COPPER	2	QF16	1.75	3.50	.05	1.25	1.25	.75	.43	A2572-3-QF
8	13	MOLY	2	QF16	1.75	3.50	.05	1.25	1.25	.75	.43	A2572-2-QF

See Section 7 for connectors, wiring, and other accessories.



1000 Volts DC / to 25 Amps / 2 to 8 Pins 1" BASEPLATE

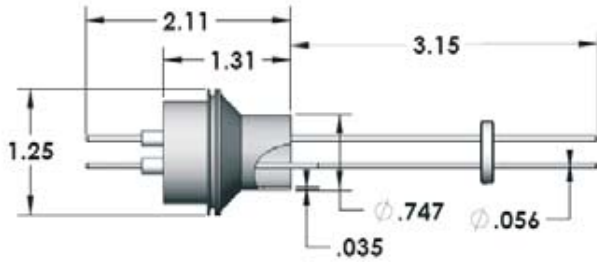


PINS	AMPS	CONDUCTOR	A	B	C	C-C	PART #
2	25	COPPER	4.18	2.32	.05	.31	A0505-1-BP
2	8	NICKEL	4.18	2.32	.05	.31	A0505-2-BP
2	1	STN STL	4.18	2.32	.05	.31	A0505-3-BP
4	25	COPPER	4.18	2.32	.05	.38	A0504-1-BP
4	8	NICKEL	4.18	2.32	.05	.38	A0504-2-BP
4	1	STN STL	4.18	2.32	.05	.38	A0504-3-BP
8	7	KOVAR	3.83	1.92	.05	.43	A0971-1-BP
8	25	COPPER	3.83	1.92	.05	.43	A0971-2-BP

See Section 7 for connectors, wiring, and other accessories.

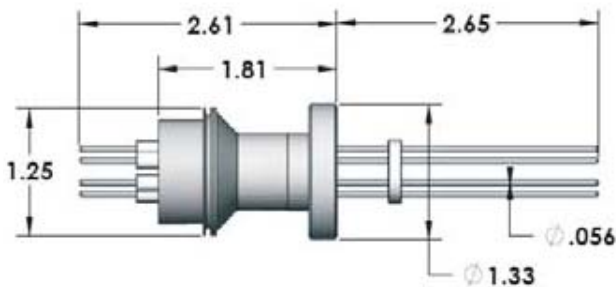


2000 Volts DC / 10 Amps / 4, 6, & 10 Pins
All Conductors Alumel
WELDABLE



PINS	PART #
4	A0421-4-W
6	A0422-4-W
10	A0184-4-W

CONFLAT FLANGE

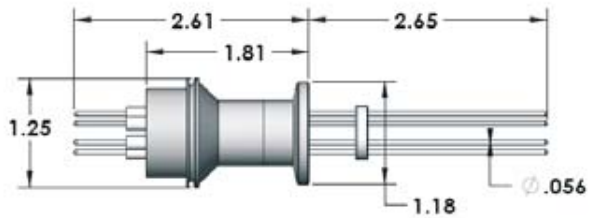


PINS	PART #
4	A0423-4-CF
6	A0423-8-CF
10	A0423-12-CF

See Section 7 for connectors, wiring, and other accessories.

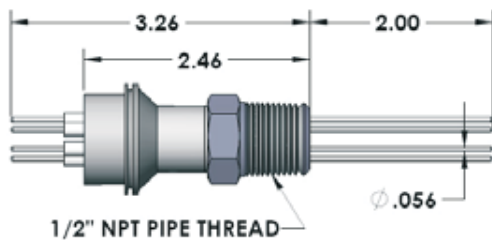


2000 Volts DC / 10 Amps / 4, 6, & 10 Pins All Conductors Alumel **QUICK FLANGE**



PINS	PART #
4	A0425-4-CF
6	A0425-8-CF
10	A0425-12-CF

NPT PIPE THREAD

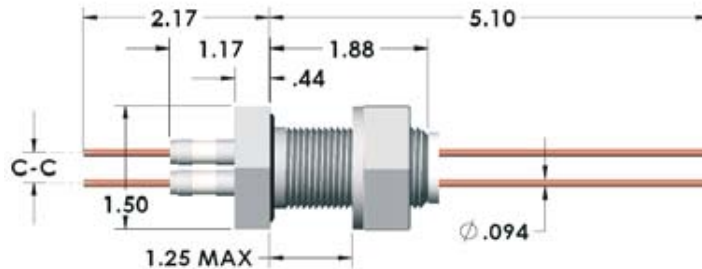


PINS	PART #
4	A0424-4-NPT
6	A0424-8-NPT
10	A0424-12-NPT

See Section 7 for connectors, wiring, and other accessories.



2000 Volts DC / to 50 Amps / 1 to 4 Pins
1" BASEPLATE



PINS	AMPS	CONDUCTOR	C-C	PART #
1	50	COPPER	---	A0525-1-BP
1	15	NICKEL	---	A0525-2-BP
1	3	STN STL	---	A0525-3-BP
2	50	COPPER	.38	A0526-1-BP
2	15	NICKEL	.38	A0526-2-BP
2	3	STN STL	.38	A0526-3-BP
3	50	COPPER	.45	A0527-1-BP
3	15	NICKEL	.45	A0527-2-BP
3	3	STN STL	.45	A0527-3-BP
4	50	COPPER	.51	A0528-1-BP
4	15	NICKEL	.51	A0528-2-BP
4	3	STN STL	.51	A0528-3-BP

See Section 7 for connectors, wiring, and other accessories.



5000 Volts DC / to 180 Amps / 1 Pin WELDABLE

Fig. 1

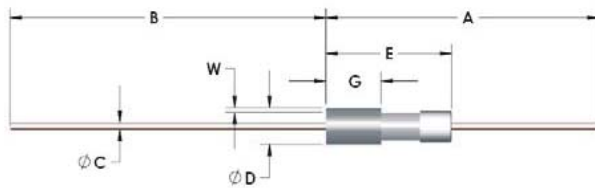
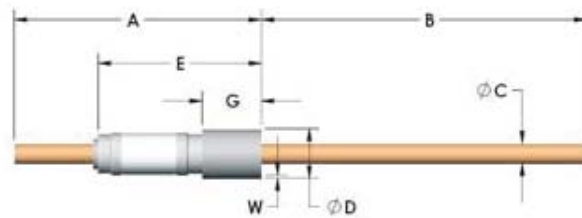


Fig. 2

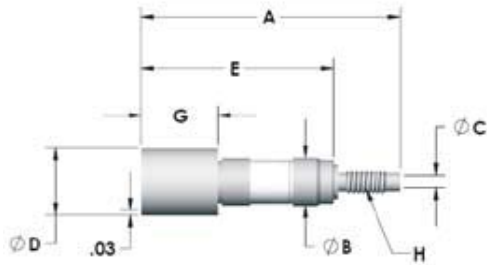


AMPS	CONDUCTOR	FIG	A	B	C	D	E	G	W	PART #
25	COPPER	1	1.85	2.15	.050	.247	.85	.37	.015	A0263-1-W
8	NICKEL	1	1.85	2.15	.050	.247	.85	.37	.015	A0263-2-W
1	STN STL	1	1.85	2.15	.050	.247	.85	.37	.015	A0263-3-W
50	COPPER	2	2.25	5.00	.094	.435	1.25	.50	.030	A0069-5-W
15	NICKEL	2	2.25	5.00	.092	.435	1.25	.50	.030	A0069-3-W
100	COPPER	2	2.32	4.93	.160	.495	1.32	.50	.030	A0284-1-W
30	NICKEL	2	2.32	4.93	.160	.495	1.32	.50	.030	A0284-2-W
180	COPPER	2	3.13	4.12	.250	.622	2.13	.75	.030	A0106-1-W
55	NICKEL	2	3.13	4.12	.250	.622	2.13	.75	.030	A0106-3-W
7	STN STL	2	3.13	4.12	.250	.622	2.13	.75	.030	A0106-2-W

See Section 7 for connectors, wiring, and other accessories.



5000 Volts DC / Ø Pins
WELDABLE



A	B	C	D	E	G	H	PART #
1.69	0.31	.082	.435	1.26	0.50	8/32	A0036-1-W

5000 Volts DC / to 180 Amps / 1 Pin
NPT PIPE THREAD

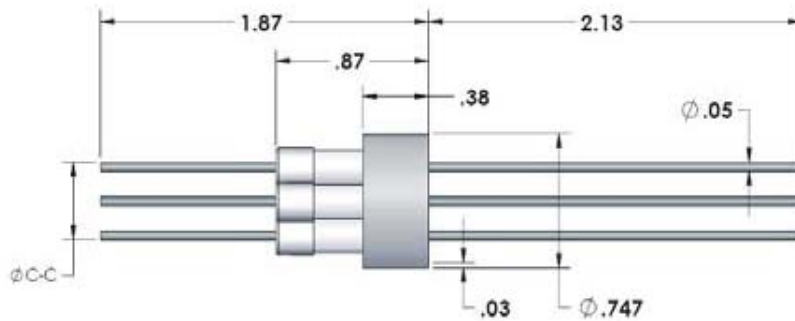


AMPS	CONDUCTOR	NPT	HEX	A	B	C	E	G	H	PART #
50	COPPER	.125	7/16	2.48	4.77	.094	1.48	.730	---	A0271-2-NPT
15	NICKEL	.125	7/16	2.48	4.77	.094	1.48	.730	---	A0271-1-NPT
25	COPPER	.125	7/16	2.48	4.77	.050	1.48	.730	---	A0271-4-NPT
8	NICKEL	.125	7/16	2.48	4.77	.050	1.48	.730	---	A0271-3-NPT
180	COPPER	.500	7/8	3.42	3.83	.250	2.42	1.09	.54	A0003-1-NPT
55	NICKEL	.500	7/8	3.42	3.83	.250	2.42	1.09	.54	A0003-5-NPT
7	STN STL	.500	7/8	3.42	3.83	.250	2.42	1.09	.54	A0003-3-NPT
100	COPPER	.375	11/16	2.71	4.54	.160	1.71	.890	.40	A0287-1-NPT
30	NICKEL	.375	11/16	2.71	4.54	.160	1.71	.890	.40	A0287-2-NPT

See Section 7 for connectors, wiring, and other accessories.



5000 Volts DC / to 25 Amps / 2 & 4 Pins WELDABLE

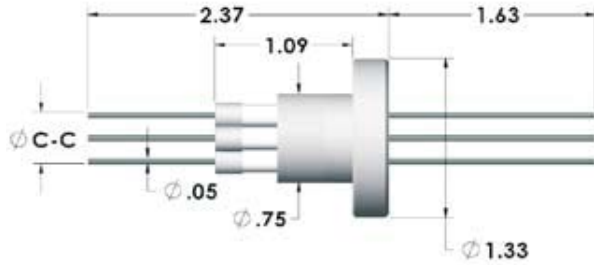


PINS	AMPS	CONDUCTOR	CC	PART #
2	25	COPPER	.310	A0267-3-W
2	8	NICKEL	.310	A0267-1-W
2	1	STN STL	.310	A0267-2-W
4	25	COPPER	.375	A0268-3-W
4	8	NICKEL	.375	A0268-1-W
4	1	STN STL	.375	A0268-2-W

See Section 7 for connectors, wiring, and other accessories.

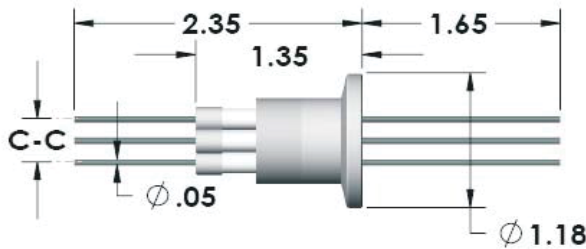


5000 Volts DC / to 25 Amps / 2 & 4 Pins
CONFLAT FLANGE



PINS	AMPS	CONDUCTOR	CC	PART #
2	25	COPPER	.31	A0269-3-CF
2	8	NICKEL	.31	A0269-1-CF
2	1	STN STL	.31	A0269-2-CF
4	25	COPPER	.38	A0270-3-CF
4	8	NICKEL	.38	A0270-1-CF
4	1	STN STL	.38	A0270-2-CF

QUICK FLANGE



PINS	AMPS	CONDUCTOR	CC	PART #
2	25	COPPER	.31	A0534-3-QF
2	8	NICKEL	.31	A0534-1-QF
2	1	STN STL	.31	A0534-2-QF
4	25	COPPER	.38	A0535-3-QF
4	8	NICKEL	.38	A0535-1-QF
4	1	STN STL	.38	A0535-2-QF

See Section 7 for connectors, wiring, and other accessories.



5000 Volts DC / to 50 Amps / 1 to 12 Pins CONFLAT FLANGE

Fig. 1

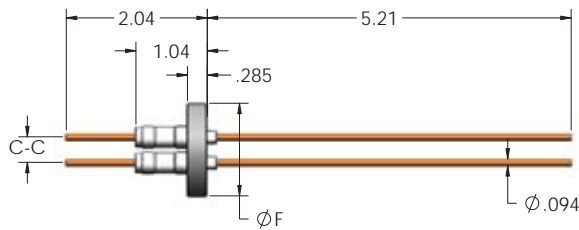
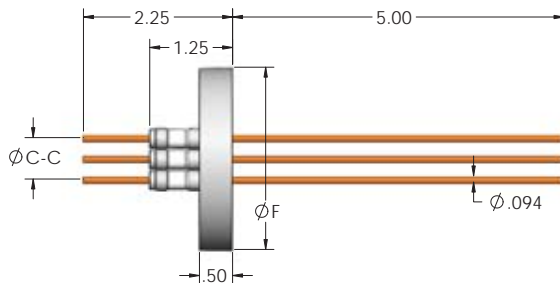


Fig. 2

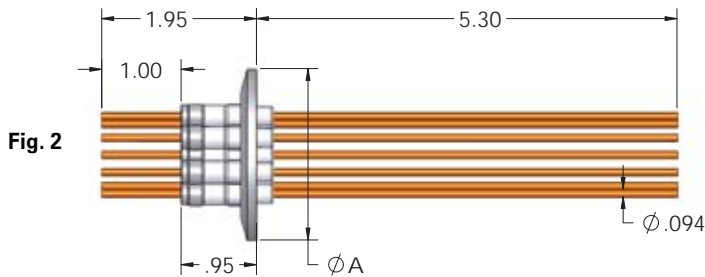
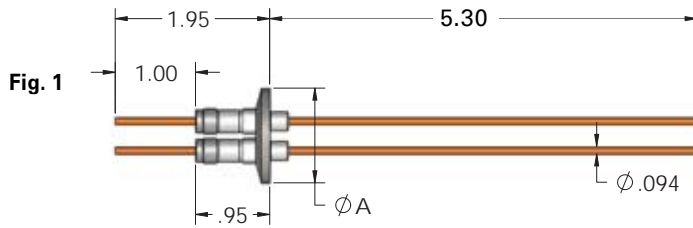


PINS	AMPS	CONDUCTOR	FIG	FLANGE	F	CC	PART #
1	50	COPPER	1	CF16	1.33	---	A0273-1-CF
1	15	NICKEL	1	CF16	1.33	---	A0273-2-CF
2	50	COPPER	1	CF16	1.33	.36	A0275-1-CF
2	15	NICKEL	1	CF16	1.33	.36	A0275-2-CF
2	50	COPPER	2	CF40	2.75	.50	A0279-2-CF
2	15	NICKEL	2	CF40	2.75	.50	A0279-1-CF
3	50	COPPER	1	CF16	1.33	.40	A0277-1-CF
3	15	NICKEL	1	CF16	1.33	.40	A0277-2-CF
4	50	COPPER	2	CF40	2.75	.62	A0280-2-CF
4	15	NICKEL	2	CF40	2.75	.62	A0280-1-CF
8	50	COPPER	2	CF40	2.75	1.00	A0281-2-CF
8	15	NICKEL	2	CF40	2.75	1.00	A0281-1-CF
12	50	COPPER	2	CF40	2.75	1.21	A0283-2-CF
12	15	NICKEL	2	CF40	2.75	1.21	A0283-1-CF

See Section 7 for connectors, wiring, and other accessories.



5000 Volts DC / to 50 Amps / 1 to 12 Pins
QUICK FLANGE

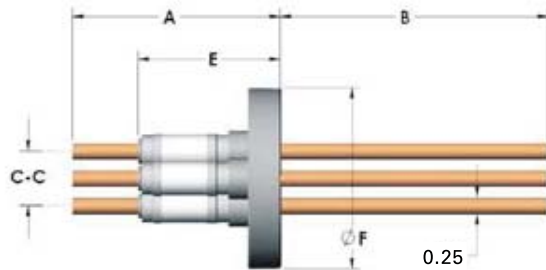
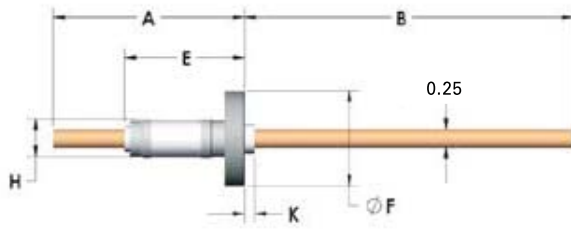


PINS	AMPS	CONDUCTOR	FIG	FLANGE	A	CC	PART #
1	50	COPPER	1	QF16	1.18	---	A0516-2-QF
1	15	NICKEL	1	QF16	1.18	---	A0516-1-QF
2	50	COPPER	1	QF16	1.18	.39	A0818-2-QF
2	15	NICKEL	1	QF16	1.18	.39	A0818-1-QF
2	50	COPPER	2	QF40	2.16	.50	A0515-2-QF
2	15	NICKEL	2	QF40	2.16	.50	A0515-1-QF
3	50	COPPER	1	QF16	1.18	.40	A0514-2-QF
3	15	NICKEL	1	QF16	1.18	.40	A0514-1-QF
4	50	COPPER	2	QF40	2.16	.62	A0513-2-QF
4	15	NICKEL	2	QF40	2.16	.62	A0513-1-QF
8	50	COPPER	2	QF40	2.16	1.00	A0509-2-QF
8	15	NICKEL	2	QF40	2.16	1.00	A0509-1-QF
12	50	COPPER	2	QF40	2.16	1.25	A0820-2-QF
12	15	NICKEL	2	QF40	2.16	1.25	A0820-1-QF

See Section 7 for connectors, wiring, and other accessories.



5000 Volts DC / to 180 Amps / 1 to 4 Pins CONFLAT FLANGE

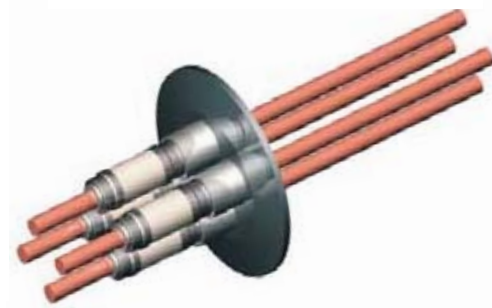
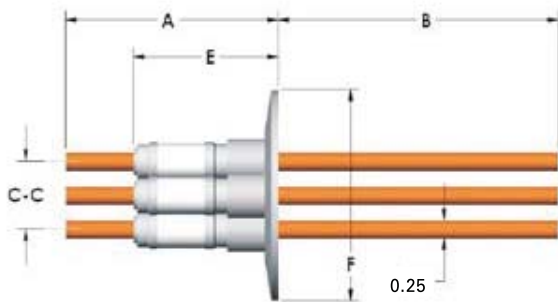
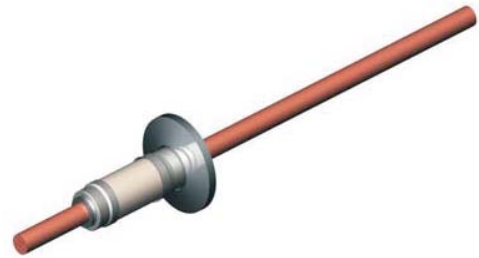
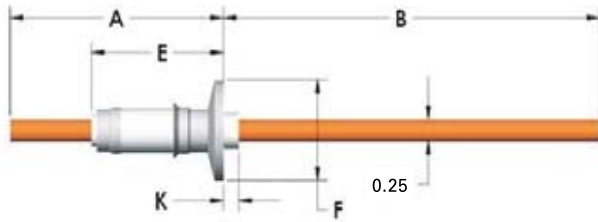


PINS	AMPS	CONDUCTOR	A	B	E	F	K	CC	PART #
1	180	COPPER	2.67	4.58	1.67	1.33	0.14	---	A0049-1-CF
1	55	NICKEL	2.67	4.58	1.67	1.33	0.14	---	A0049-5-CF
1	7	STN STL	2.67	4.58	1.67	1.33	0.14	---	A0049-3-CF
1	180	COPPER	3.18	4.07	2.18	2.75	---	---	A0113-1-CF
1	55	NICKEL	3.18	4.07	2.18	2.75	---	---	A0113-5-CF
1	7	STN STL	3.18	4.07	2.18	2.75	---	---	A0113-3-CF
2	180	COPPER	3.18	4.07	2.18	2.75	---	0.75	A0065-1-CF
2	55	NICKEL	3.18	4.07	2.18	2.75	---	0.75	A0065-5-CF
2	7	STN STL	3.18	4.07	2.18	2.75	---	0.75	A0065-3-CF
3	180	COPPER	3.18	4.07	2.18	2.75	---	0.95	A0064-1-CF
3	55	NICKEL	3.18	4.07	2.18	2.75	---	0.95	A0064-5-CF
3	7	STN STL	3.18	4.07	2.18	2.75	---	0.95	A0064-3-CF
4	180	COPPER	3.18	4.07	2.18	2.75	---	0.95	A0063-1-CF
4	55	NICKEL	3.18	4.07	2.18	2.75	---	0.95	A0063-5-CF
4	7	STN STL	3.18	4.07	2.18	2.75	---	0.95	A0063-3-CF

See Section 7 for connectors, wiring, and other accessories.



5000 Volts DC / to 180 Amps / 1 to 4 Pins
QUICK FLANGE

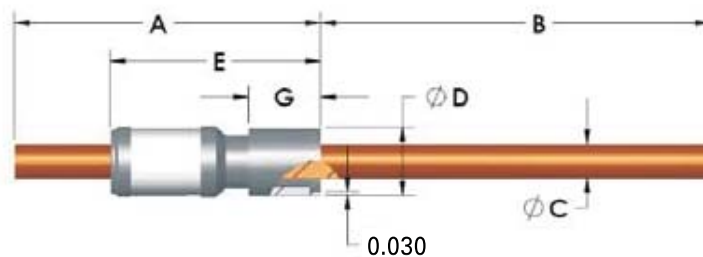


PINS	AMPS	CONDUCTOR	A	B	E	F	K	CC	PART #
1	180	COPPER	2.60	4.65	1.60	1.18	0.23	---	A0117-1-QF
1	55	NICKEL	2.60	4.65	1.60	1.18	0.23	---	A0117-5-QF
1	7	STN STL	2.60	4.65	1.60	1.18	0.23	---	A0117-3-QF
1	180	COPPER	3.13	4.12	2.13	2.16	---	---	A0118-1-QF
1	55	NICKEL	3.13	4.12	2.13	2.16	---	---	A0118-5-QF
1	7	STN STL	3.13	4.12	2.13	2.16	---	---	A0118-3-QF
2	180	COPPER	3.13	4.12	2.13	2.16	---	0.75	A0114-1-QF
2	55	NICKEL	3.13	4.12	2.13	2.16	---	0.75	A0114-5-QF
2	7	STN STL	3.13	4.12	2.13	2.16	---	0.75	A0114-3-QF
3	180	COPPER	3.13	4.12	2.13	2.16	---	0.95	A0115-1-QF
3	55	NICKEL	3.13	4.12	2.13	2.16	---	0.95	A0115-5-QF
3	7	STN STL	3.13	4.12	2.13	2.16	---	0.95	A0115-3-QF
4	180	COPPER	3.13	4.12	2.13	2.95	---	0.95	A0116-1-QF
4	55	NICKEL	3.13	4.12	2.13	2.95	---	0.95	A0116-5-QF
4	7	STN STL	3.13	4.12	2.13	2.95	---	0.95	A0116-3-QF

See Section 7 for connectors, wiring, and other accessories.



8000 Volts DC / to 800 Amps / 1 Pin WELDABLE

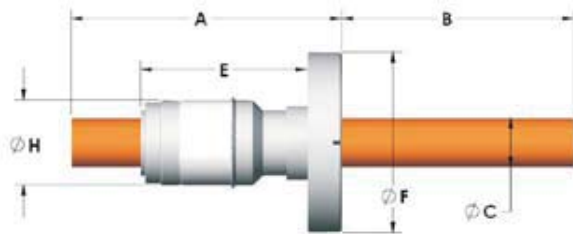


AMPS	CONDUCTOR	A	B	C	D	E	G	PART #
800	COPPER	3.85	3.40	.75	1.12	2.80	0.75	A0122-2-W
250	NICKEL	3.85	3.40	.75	1.12	2.80	0.75	A0122-5-W
450	COPPER	3.80	3.40	.50	1.12	2.80	0.75	A8205-5-W
150	NICKEL	3.80	3.40	.50	1.12	2.80	0.75	A8205-4-W
300	COPPER	3.25	4.10	.38	.747	2.25	0.75	A0108-2-W
100	NICKEL	3.25	4.10	.38	.747	2.25	0.75	A0108-4-W

See Section 7 for connectors, wiring, and other accessories.

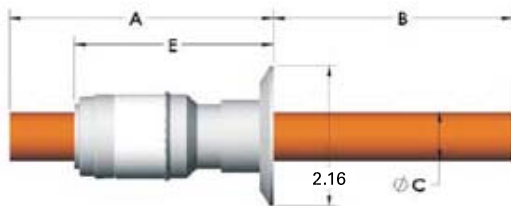


8000 Volts DC / to 800 Amps / 1 Pin
CONFLAT FLANGE



AMPS	CONDUCTOR	A	B	C	E	F	H	PART #
800	COPPER	3.85	3.35	0.75	2.90	2.73	1.30	A0236-2-CF
250	NICKEL	3.85	3.35	0.75	2.90	2.73	1.30	A0236-5-CF
450	COPPER	3.85	3.35	0.50	2.90	2.73	1.30	A8206-5-CF
150	NICKEL	3.85	3.35	0.50	2.90	2.73	1.30	A8206-4-CF
300	COPPER	2.69	4.57	0.38	1.69	1.33	.78	A0221-2-CF
100	NICKEL	2.69	4.57	0.38	1.69	1.33	.78	A0221-4-CF

QUICK FLANGE

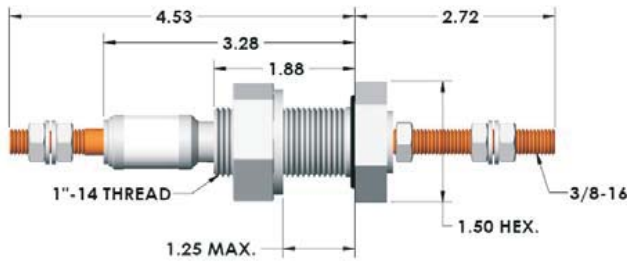


AMPS	CONDUCTOR	A	B	C	E	H	PART #
800	COPPER	3.80	3.40	0.75	2.85	1.30	A0219-2-QF
250	NICKEL	3.80	3.40	0.75	2.85	1.30	A0219-5-QF
450	COPPER	3.80	3.40	0.50	2.85	1.30	A8207-5-QF
150	NICKEL	3.80	3.40	0.50	2.85	1.30	A8207-4-QF
300	COPPER	3.15	4.10	0.38	2.15	0.78	A0220-2-QF
100	NICKEL	3.15	4.10	0.38	2.15	0.78	A0220-4-QF

See Section 7 for connectors, wiring, and other accessories.

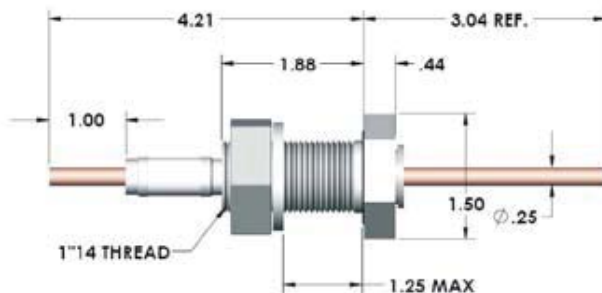


3000 Volts DC / to 250 Amps / 1 Pin BASEPLATE



AMPS	CONDUCTOR	PART #
250	COPPER	A0542-1-BP

5000 Volts DC / to 180 Amps / 1 Pin BASEPLATE



CONDUCTOR	AMPS	PART #
COPPER	180	A0543-1-BP
NICKEL	55	A0543-2-BP
STN STL	7	A0543-3-BP

See Section 7 for connectors, wiring, and other accessories.



12,000 Volts DC / to 150 Amps / 1 Pin
1" BASEPLATE

Fig. 1

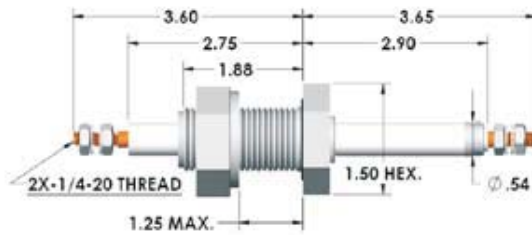
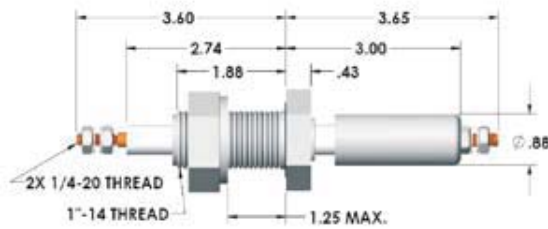


Fig. 2

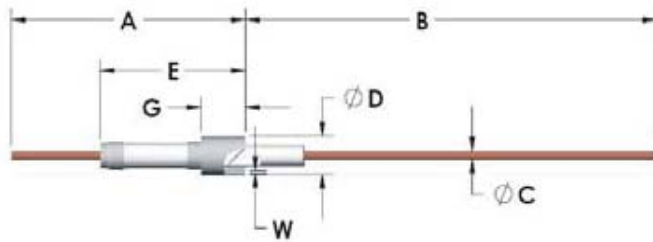


TYPE	AMPS	CONDUCTOR	FIG	PART #
EXPOSED	150	COPPER	1	A0544-1-BP
EXPOSED	75	NICKEL	1	A0544-2-BP
EXPOSED	7	STN STL	1	A0544-3-BP
SHIELDED	150	COPPER	2	A0545-1-BP
SHIELDED	75	NICKEL	2	A0545-2-BP
SHIELDED	7	STN STL	2	A0545-3-BP

See Section 7 for connectors, wiring, and other accessories.

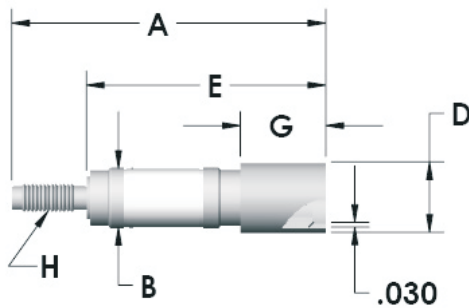


10,000 Volts DC / to 50 Amps / 1 Pin WELDABLE



AMPS	CONDUCTOR	A	B	C	D	E	G	W	PART #
50	COPPER	2.63	4.62	.094	.435	1.63	0.50	.030	A0066-5-W
15	NICKEL	2.63	4.62	.092	.435	1.63	0.50	.030	A0066-3-W

10,000 Volts DC / Ø Pins WELDABLE



A	B	C	D	E	G	H	PART #
2.79	.54	.150	.622	2.13	.75	.250-28	A0038-1-W

See Section 7 for connectors, wiring, and other accessories.



10,000 Volts DC / to 50 Amps / 1 to 4 Pins
CONFLAT FLANGE

Fig. 1

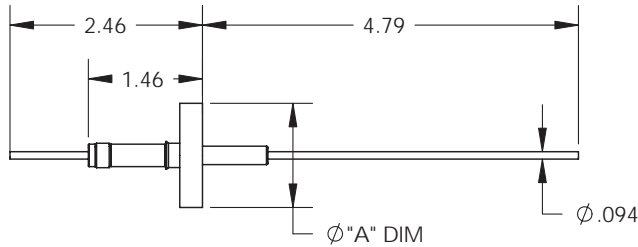
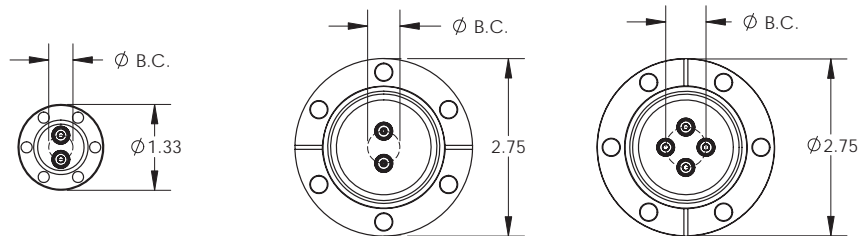
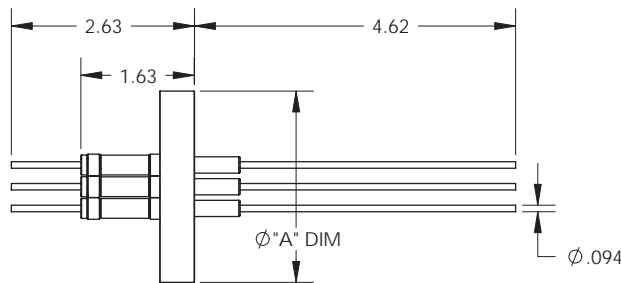


Fig. 2



PINS	AMPS	CONDUCTOR	FIG	Ø "A" DIM	Ø B.C.	PART #
1	50	COPPER	1	1.33	---	A0043-5-CF
1	15	NICKEL	1	1.33	---	A0043-3-CF
1	50	COPPER	1	2.75	---	A0043-11-CF
2	50	COPPER	2	1.33	.38	A0042-3-CF
2	15	NICKEL	2	1.33	.38	A0042-1-CF
2	50	COPPER	2	2.75	.50	A0044-3-CF
2	15	NICKEL	2	2.75	.50	A0044-1-CF
4	50	COPPER	2	2.75	.62	A0045-3-CF
4	15	NICKEL	2	2.75	.62	A0045-1-CF

See Section 7 for connectors, wiring, and other accessories.



10,000 Volts DC / to 50 Amps / 1 to 4 Pins QUICK FLANGE

Fig. 1

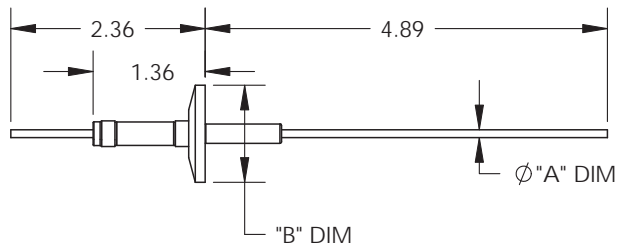
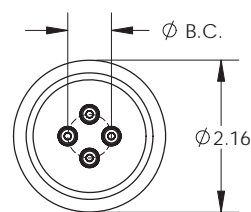
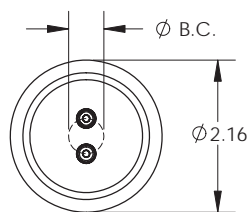
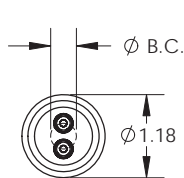
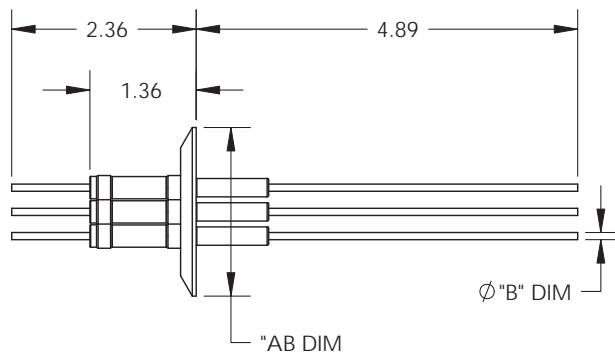


Fig. 2

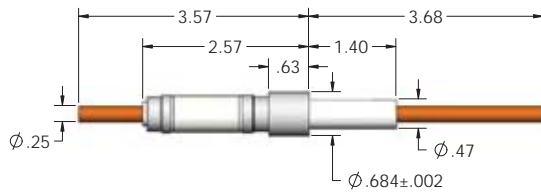


PINS	AMPS	CONDUCTOR	FIG	"A" DIM	ϕ "B" DIM	ϕ B.C.	PART #
1	50	COPPER	1	.094	1.18	---	A0508-2-QF
1	15	NICKEL	1	.092	1.18	---	A0508-1-QF
2	50	COPPER	1	.094	1.18	.39	A0781-2-QF
2	15	NICKEL	1	.092	1.18	.39	A0781-1-QF
2	50	COPPER	2	.094	2.16	.50	A0507-2-QF
2	15	NICKEL	2	.092	2.16	.50	A0507-1-QF
4	50	COPPER	2	.094	2.16	.62	A0506-2-QF
4	15	NICKEL	2	.092	2.16	.62	A0506-1-QF

See Section 7 for connectors, wiring, and other accessories.



12,000 Volts DC / to 180 Amps / 1 Pin
WELDABLE



AMPS	CONDUCTOR	PART #	PRICE
180	COPPER	A0548-1-W	100.00
55	NICKEL	A0548-3-W	100.00
7	STN STL	A0548-2-W	100.00

12,000 Volts DC / to 180 Amps / 1 or 2 Pins
CONFLAT FLANGE

Fig. 1

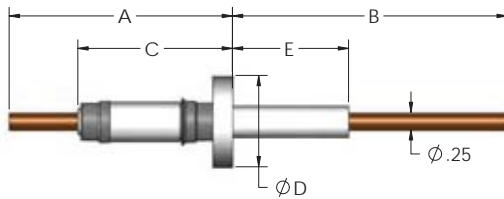
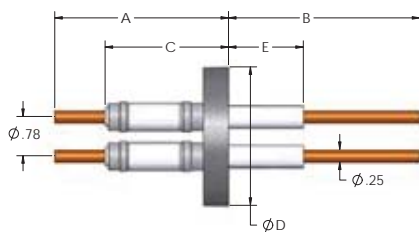


Fig. 2

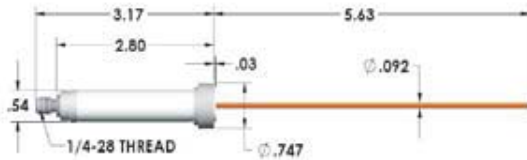


PINS	AMPS	CONDUCTOR	FIG	A	B	C	D	E	PART #
1	180	COPPER	1	3.25	4.00	2.25	1.33	1.69	A0549-1-CF
1	55	NICKEL	1	3.25	4.00	2.25	1.33	1.69	A0549-3-CF
1	7	STN STL	1	3.25	4.00	2.25	1.33	1.69	A0549-2-CF
1	180	COPPER	1	3.61	3.23	2.61	2.75	1.35	A0551-1-CF
1	55	NICKEL	1	3.61	3.23	2.61	2.75	1.35	A0551-3-CF
1	7	STN STL	1	3.61	3.23	2.61	2.75	1.35	A0551-2-CF
2	180	COPPER	2	3.61	3.23	2.61	2.75	1.35	A0550-1-CF
2	55	NICKEL	2	3.61	3.23	2.61	2.75	1.35	A0550-3-CF
2	7	STN STL	2	3.61	3.23	2.61	2.75	1.35	A0550-2-CF

See Section 7 for connectors, wiring, and other accessories.

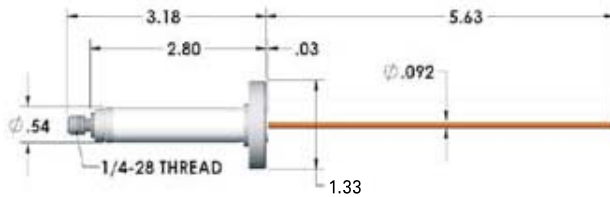


20,000 Volts DC / to 50 Amps / 1 Pin WELDABLE



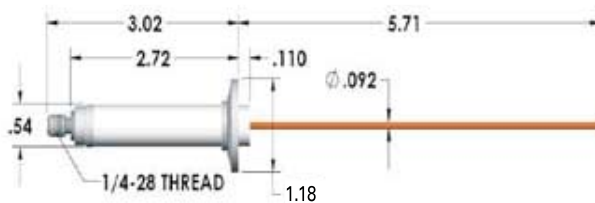
AMPS	CONDUCTOR	PART #
15	NICKEL	A0531-1-W
50	COPPER	A0531-2-W

CONFLAT FLANGE



AMPS	CONDUCTOR	PART #
15	NICKEL	A0533-1-CF
50	COPPER	A0533-2-CF

QUICK FLANGE



AMPS	CONDUCTOR	PART #
15	NICKEL	A0532-1-QF
50	COPPER	A5743-1-QF

See Section 7 for connectors, wiring, and other accessories.



20,000 to 30,000 Volts DC / to 50 Amps / 1 Pin
WELDABLE

Fig. 1

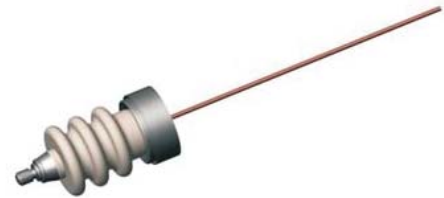
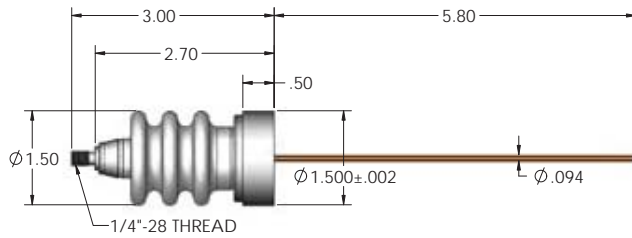


Fig. 2

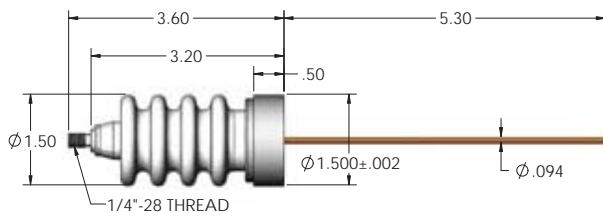
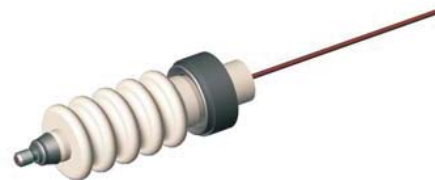
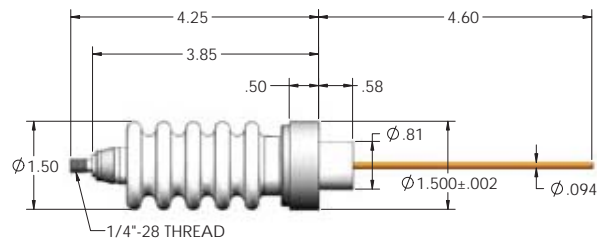


Fig. 3

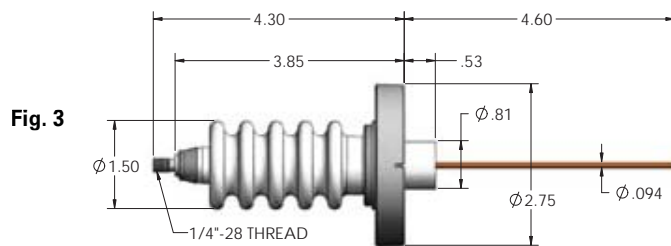
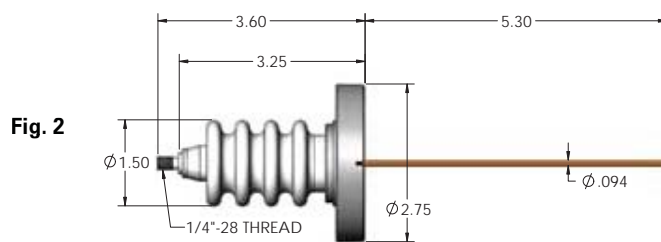
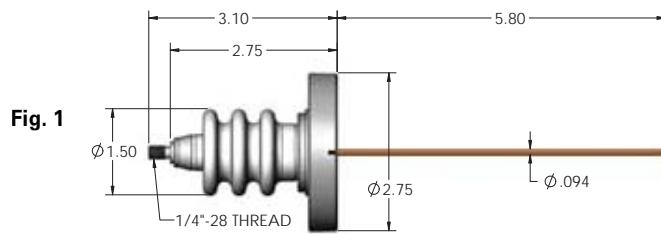


VOLTS	AMPS	CONDUCTOR	FIG	PART #
20KV	3	STN STL	1	A0232-1-W
20KV	50	COPPER	1	A0232-2-W
25KV	3	STN STL	2	A0231-1-W
25KV	50	COPPER	2	A0231-2-W
30KV	3	STN STL	3	A0230-1-W
30KV	50	COPPER	3	A0230-2-W
30KV	15	NICKEL	3	A0230-3-W

See Section 7 for connectors, wiring, and other accessories.



20,000 to 30,000 Volts DC / to 50 Amps / 1 Pin CONFLAT FLANGE



VOLTS	AMPS	CONDUCTOR	MOUNT	FIG	PART #
20KV	3	STN STL	CF40	1	A0234-1-CF
20KV	50	COPPER	CF40	1	A0234-2-CF
25KV	3	STN STL	CF40	2	A0234-3-CF
25KV	50	COPPER	CF40	2	A0234-4-CF
30KV	3	STN STL	CF40	3	A0234-5-CF
30KV	50	COPPER	CF40	3	A0234-6-CF

See Section 7 for connectors, wiring, and other accessories.



20,000 to 30,000 Volts DC / to 180 Amps / 1 or 2 Pins
WELDABLE

Fig. 1

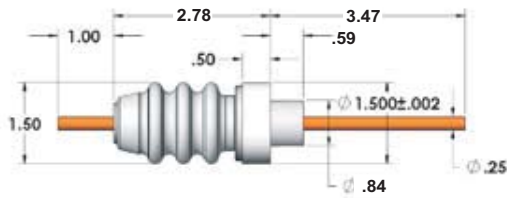


Fig. 2

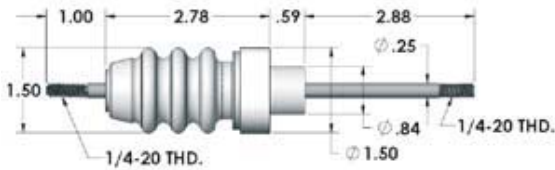
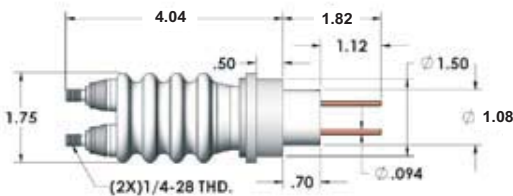


Fig. 3

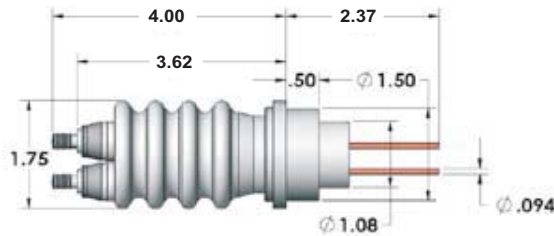


VOLTS	AMPS	CONDUCTOR	FIG	PART #
20KV	180	COPPER	1	A0658-1-W
20KV	55	NICKEL	1	A0658-2-W
20KV	150	COPPER	2	A7000-1-W
20KV	50	NICKEL	2	A7000-2-W
20KV	7	STN STL	2	A7000-3-W
30KV	50	COPPER	3	A2090-1-W

See Section 7 for connectors, wiring, and other accessories.

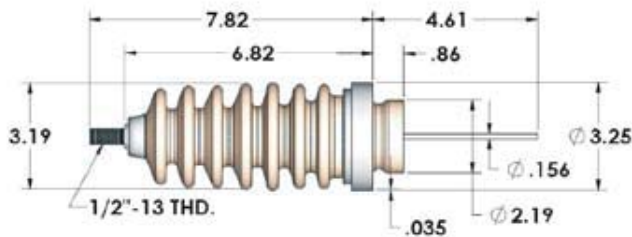


25,000 Volts DC / to 50 Amps / 3 Pins WELDABLE



AMPS	CONDUCTOR	PART #
50	COPPER	A3882-1-W
3	STN STL	A3882-4-W

60,000 Volts DC / 3 Amps / 1 Pin WELDABLE



CONDUCTOR	PART #
STN STL	A3106-1-W

See Section 7 for connectors, wiring, and other accessories.



20,000 to 30,000 Volts DC / 7 to 180 Amps / 1 or 2 Pins
CONFLAT FLANGE

Fig. 1

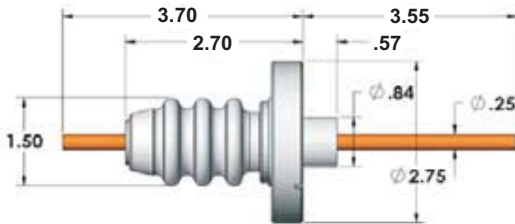


Fig. 2

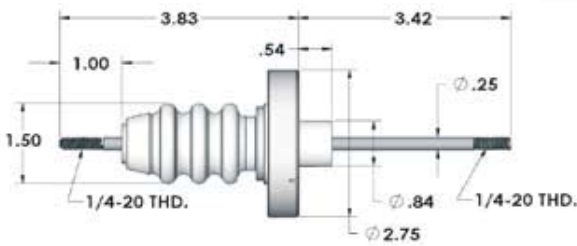
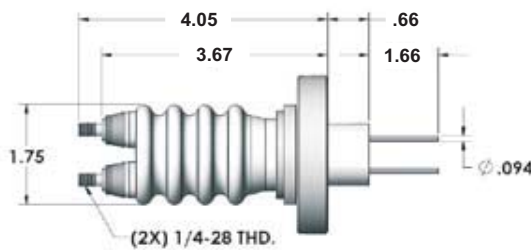


Fig. 3

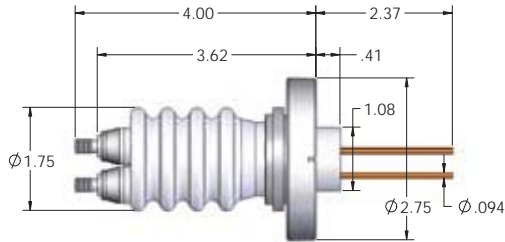


VOLTS	AMPS	CONDUCTOR	MOUNT	FIG	PART #
20KV	180	COPPER	CF40	1	A1158-1-CF
20KV	55	NICKEL	CF40	1	A1158-2-CF
20KV	150	COPPER	CF40	2	A7001-1-CF
20KV	50	NICKEL	CF40	2	A7001-2-CF
20KV	7	NICKEL	CF40	2	A7001-3-CF
30KV	50	COPPER	CF40	3	A2089-1-CF

See Section 7 for connectors, wiring, and other accessories.

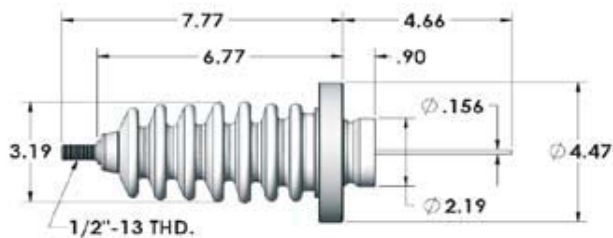


25,000 Volts DC / 50 Amps / 3 Pins
CONFLAT FLANGE



CONDUCTOR	MOUNT	PART #
COPPER	CF40	A6203-1-CF

60,000 Volts DC / 3 Amps / 1 Pin
CONFLAT FLANGE



CONDUCTOR	MOUNT	PART #
STN STL	CF63	A3107-1-CF

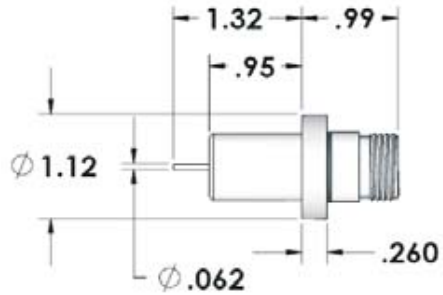
See Section 7 for connectors, wiring, and other accessories.



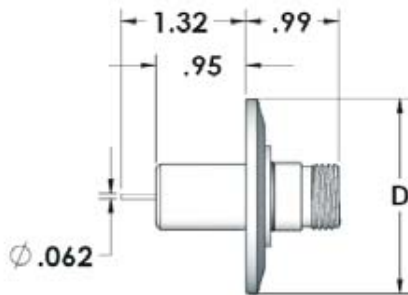
40,000 Volts DC / to 7 Amps / 1 Pin

Air-side Connector and Cable Included

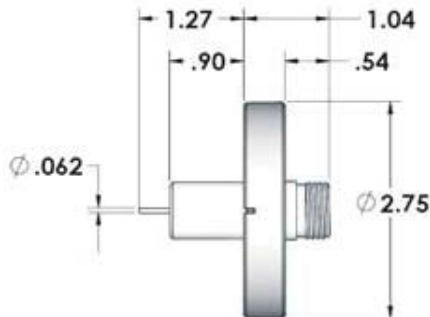
WELDABLE



QUICK FLANGE



CONFLAT FLANGE

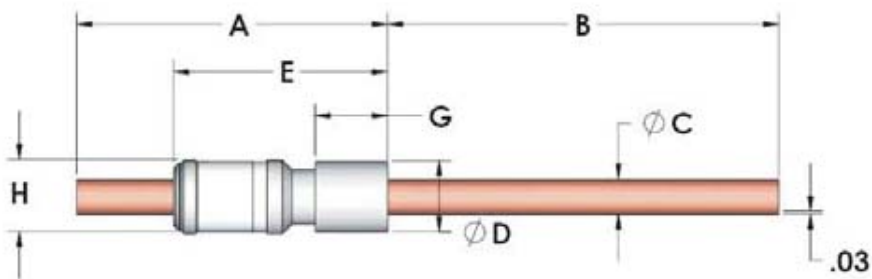


MOUNT	D	PART #
WELDABLE	---	A2607-1-W
QF40	2.16	A2606-1-QF
QF50	2.95	A2606-2-QF
CF40	---	A2605-1-CF
CONNECTOR	---	A2608-1-CN

See Section 7 for connectors, wiring, and other accessories.



Water-Cooled — 5000 to 8000 Volts DC / 1 Tube WELDABLE

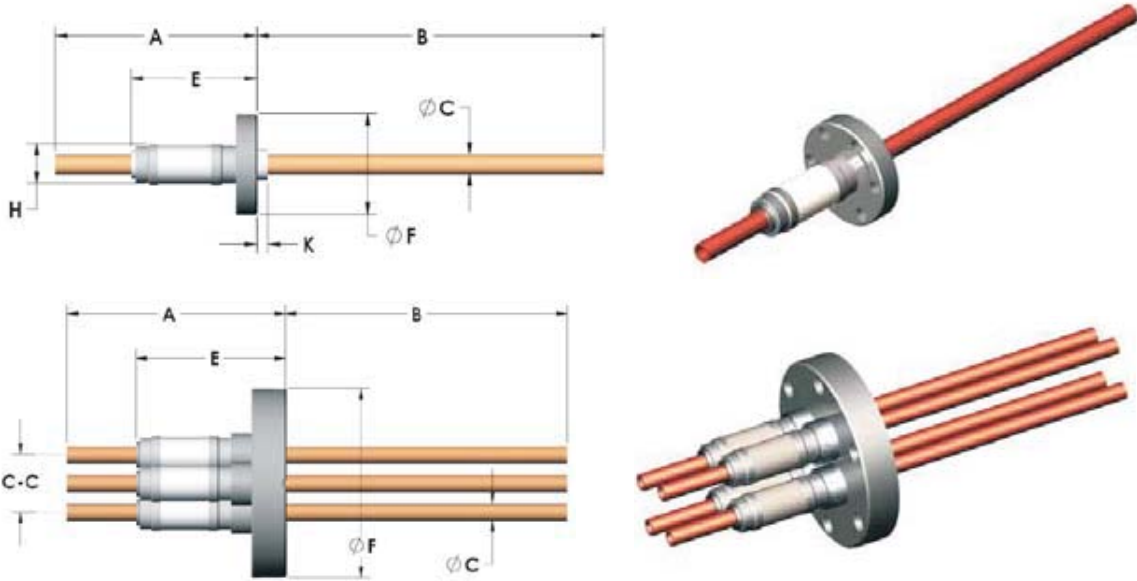


VOLTS	CONDUCTOR	A	B	C	D	E	G	H	PART #
5KV	COPPER	3.13	4.12	0.25	.622	2.13	0.75	0.54	A0106-4-W
5KV	NICKEL	3.13	4.12	0.25	.622	2.13	0.75	0.54	A0106-6-W
5KV	STN STL	3.13	4.12	.25	.622	2.13	.75	.54	A0106-5-W
8KV	COPPER	3.80	3.40	0.75	1.12	2.85	0.75	1.30	A0122-1-W
8KV	COPPER	3.80	3.40	0.50	1.12	2.85	0.75	1.30	A8205-2-W
8KV	COPPER	3.15	4.10	0.38	.747	2.15	0.75	0.78	A0108-1-W

See Section 7 for connectors, wiring, and other accessories.



Water-Cooled — 5000 to 8000 Volts DC / 1 to 4 Tubes
CONFLAT FLANGE

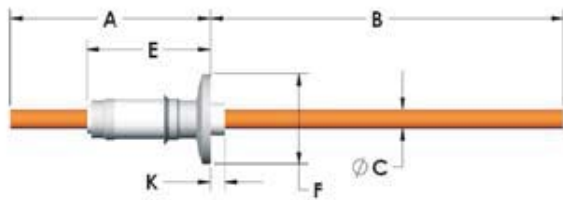
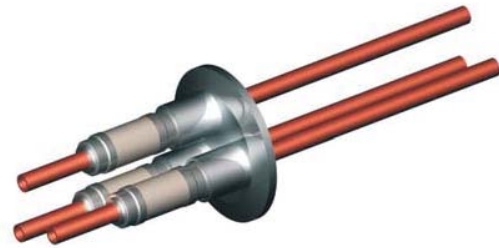
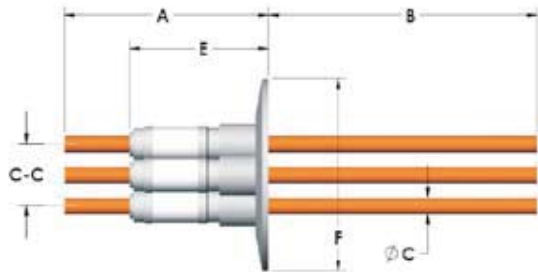


PINS	VOLTS	CONDUCTOR	A	B	C	E	F	H	K	CC	PART #
1	5KV	COPPER	2.67	4.58	.25	1.67	1.33	.54	.14	---	A0049-2-CF
1	5KV	NICKEL	2.67	4.58	.25	1.67	1.33	.54	.14	---	A0049-6-CF
1	5KV	STN STL	2.67	4.58	.25	1.67	1.33	.54	.14	---	A0049-4-CF
1	5KV	COPPER	3.18	4.07	.25	2.18	2.75	.54	---	---	A0113-2-CF
1	5KV	NICKEL	3.18	4.07	.25	2.18	2.75	.54	---	---	A0113-6-CF
1	5KV	STN STL	3.18	4.12	.25	2.18	2.75	.54	---	---	A0113-4-CF
1	8KV	COPPER	3.80	3.40	.75	2.90	2.75	1.30	---	---	A0236-1-CF
1	8KV	COPPER	3.80	3.40	.50	2.90	2.75	1.30	---	---	A8206-2-CF
1	8KV	COPPER	2.69	4.57	.38	1.69	1.33	.78	---	---	A0221-1-CF
2	5KV	COPPER	3.18	4.12	.25	2.18	2.75	.54	---	.75	A0065-2-CF
2	5KV	NICKEL	3.18	4.07	.25	2.18	2.75	.54	---	.75	A0065-6-CF
2	5KV	STN STL	3.18	4.07	.25	2.18	2.75	.54	---	.75	A0065-4-CF
3	5KV	COPPER	3.18	4.07	.25	2.18	2.75	.54	---	.95	A0064-2-CF
3	5KV	NICKEL	3.18	4.12	.25	2.18	2.75	.54	---	.95	A0064-6-CF
3	5KV	STN STL	3.18	4.12	.25	2.18	2.75	.54	---	.95	A0064-4-CF
4	5KV	COPPER	3.18	4.12	.25	2.18	2.75	.54	---	.95	A0063-2-CF
4	5KV	NICKEL	3.18	4.12	.25	2.18	2.75	.54	---	.95	A0063-6-CF
4	5KV	STN STL	3.18	4.12	.25	2.18	2.75	.54	---	.95	A0063-4-CF



Water-Cooled — 5000 to 8000 Volts DC / 1 to 4 Tubes

QUICK FLANGE

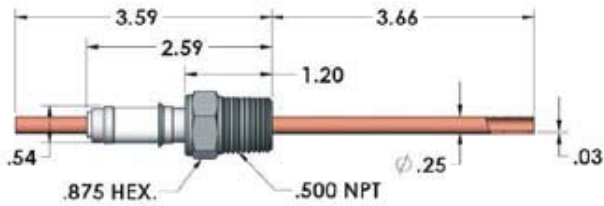


PINS	VOLTS	CONDUCTOR	A	B	C	E	F	H	K	CC	PART #
1	5KV	COPPER	2.60	4.65	.25	1.60	1.18	.54	.23	---	A0117-2-QF
1	5KV	NICKEL	2.60	4.65	.25	1.60	1.18	.54	.23	---	A0117-6-QF
1	5KV	STN STL	2.60	4.65	.25	1.60	1.18	.54	.23	---	A0117-4-QF
1	5KV	COPPER	3.13	4.12	.25	2.13	2.16	.54	---	---	A0118-2-QF
1	5KV	NICKEL	3.13	4.12	.25	2.13	2.16	.54	---	---	A0118-6-QF
1	5KV	STN STL	3.13	4.12	.25	2.13	2.16	.54	---	---	A0118-4-QF
1	8KV	COPPER	3.80	3.40	.75	2.85	2.16	1.30	---	---	A0219-1-QF
1	8KV	COPPER	3.80	3.40	.50	2.85	2.16	1.30	---	---	A8207-2-QF
1	8KV	COPPER	3.15	4.10	.38	2.15	2.16	.78	---	---	A0220-1-QF
2	5KV	COPPER	3.13	4.12	.25	2.13	2.16	.54	---	.75	A0114-2-QF
2	5KV	NICKEL	3.13	4.12	.25	2.13	2.16	.54	---	.75	A0114-6-QF
2	5KV	STN STL	3.13	4.12	.25	2.13	2.16	.54	---	.75	A0114-4-QF
3	5KV	COPPER	3.13	4.12	.25	2.13	2.16	.54	---	.95	A0115-2-QF
3	5KV	NICKEL	3.13	4.12	.25	2.13	2.16	.54	---	.95	A0115-6-QF
3	5KV	STN STL	3.13	4.12	.25	2.13	2.16	.54	---	.95	A0115-4-QF
4	5KV	COPPER	3.13	4.12	.25	2.13	2.95	.54	---	.95	A0116-2-QF
4	5KV	NICKEL	3.13	4.12	.25	2.13	2.95	.54	---	.95	A0116-6-QF
4	5KV	STN STL	3.13	4.12	.25	2.13	2.95	.54	---	.95	A0116-4-QF

See Section 7 for connectors, wiring, and other accessories.

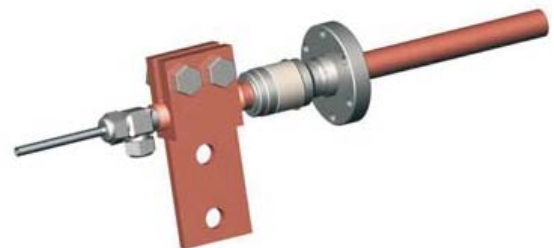
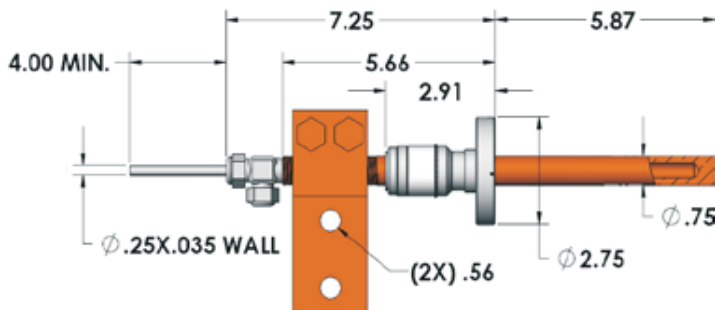


Water-Cooled — 5000 to 8000 Volts DC / 1 Tube
NPT PIPE THREAD



PINS	CONDUCTOR	PART #
1	COPPER	A0003-2-NPT
1	NICKEL	A0003-6-NPT
1	STN STL	A0003-4-NPT

8000 Volts DC / 1000 Amps / 1 Pin
CONFLAT FLANGE

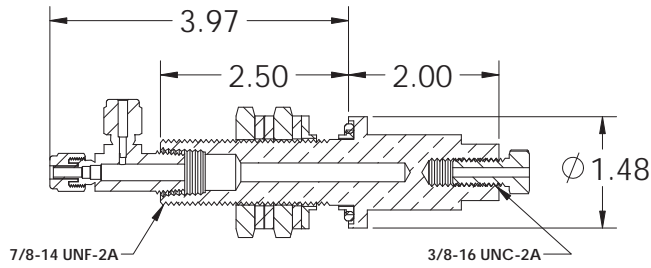


FLANGE	CONDUCTOR	PART #
CF40	COPPER	A2100-1-CF

See Section 7 for connectors, wiring, and other accessories.

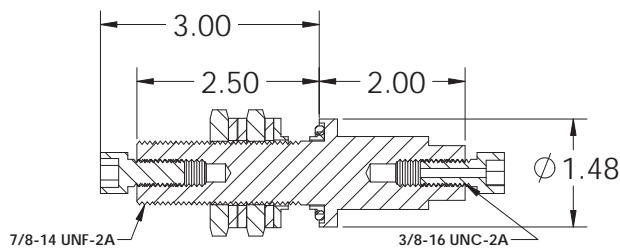


Water-Cooled — 50 Volts DC / 1000 Amps
BASEPLATE



CONDUCTOR	PART #
COPPER	A1658-1-BP

Solid Conductor — 50 Volts DC / 400 Amps

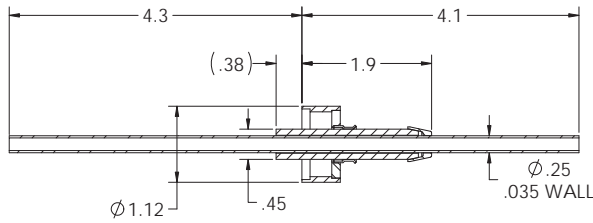


CONDUCTOR	PART #
COPPER	A1745-1-BP

See Section 7 for connectors, wiring, and other accessories.

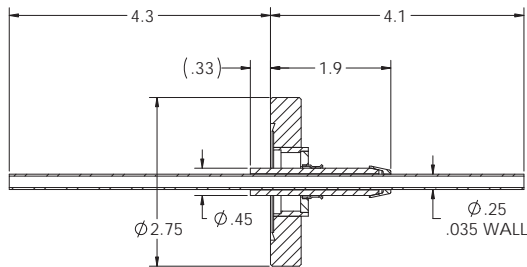


RF – 8 KV / 10 KW / 1 Conductor
WELDABLE



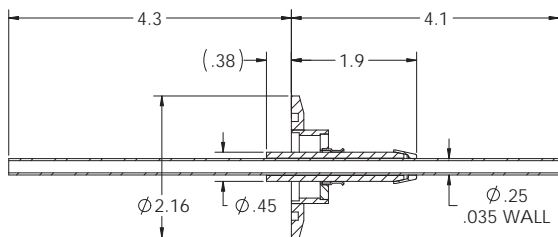
PART #
A0561-1-W

CONFLAT FLANGE



PART #
A0563-1-CF

QUICK FLANGE

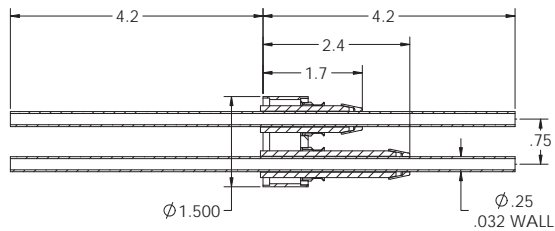


PART #
A0564-1-QF

See Section 7 for connectors, wiring, and other accessories.

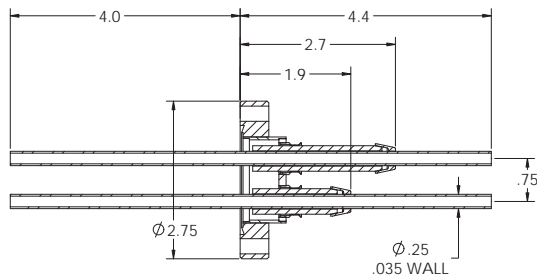


RF — 8 KV / 10 KW / 2 Conductors
WELDABLE



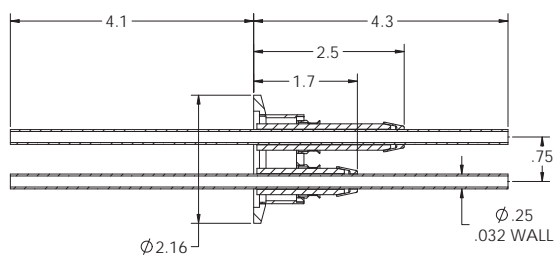
PART #
A0553-1-W

CONFLAT FLANGE



PART #
A0559-1-CF

QUICK FLANGE



PART #
A0565-1-QF

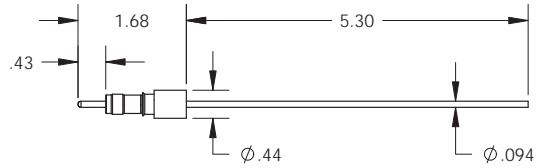
See Section 7 for connectors, wiring, and other accessories.



5000 Volts DC / to 30 Amps / 1 to 4 Pins

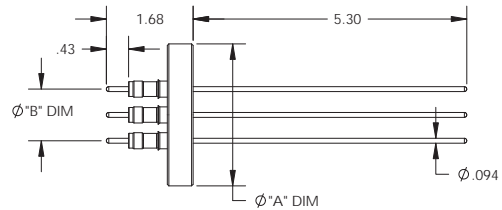
Power Glove Connector Included (96" length)

WELDABLE



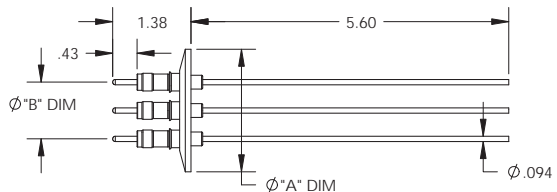
AMPS	CONDUCTOR	PART #
30	OFHC COPPER	A2118-1-W
15	NICKEL - 200	A2118-2-W
1	304 STN STL	A2118-3-W

CONFLAT FLANGE



PINS	CONDUCTOR	Ø "A" DIM	Ø "B" DIM	PART #
1	OFHC COPPER	1.33	---	A2597-1-CF
1	OFHC COPPER	2.75	---	A2597-2-CF
2	OFHC COPPER	2.75	1.00	A2207-1-CF
4	OFHC COPPER	2.75	1.00	A1836-1-CF

QUICK FLANGE



PINS	CONDUCTOR	Ø "A" DIM	Ø "B" DIM	PART #
1	OFHC COPPER	1.57	---	A5969-1-QF
1	OFHC COPPER	2.16	---	A5970-1-QF
2	OFHC COPPER	2.16	1.00	A5971-1-QF
4	OFHC COPPER	2.16	1.00	A5972-1-QF

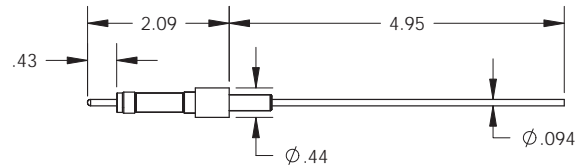
See Section 7 for connectors, wiring, and other accessories.



10,000 Volts DC / to 30 Amps / 1 to 4 Pins

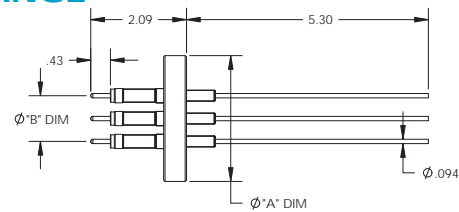
Power Glove Connector Included (96" length)

WELDABLE



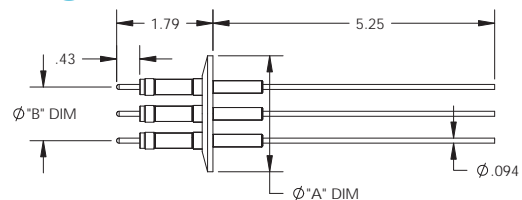
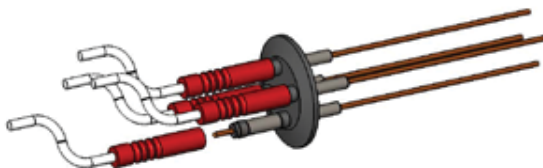
AMPS	CONDUCTOR	PART #
30	OFHC COPPER	A2535-1-W
15	NICKEL - 200	A2535-2-W
1	304 STN STL	A2535-3-W

CONFLAT FLANGE



PINS	CONDUCTOR	Ø "A" DIM	Ø "B" DIM	PART #
1	OFHC COPPER	1.33	---	A2523-1-CF
1	OFHC COPPER	2.75	---	A2523-2-CF
2	OFHC COPPER	2.75	1.00	A2523-3-CF
4	OFHC COPPER	2.75	1.00	A2523-4-CF

QUICK FLANGE



PINS	CONDUCTOR	Ø "A" DIM	Ø "B" DIM	PART #
1	OFHC COPPER	1.57	---	A5975-1-QF
1	OFHC COPPER	2.16	---	A5976-1-QF
2	OFHC COPPER	2.16	1.00	A5977-1-QF
4	OFHC COPPER	2.16	1.00	A5978-1-QF

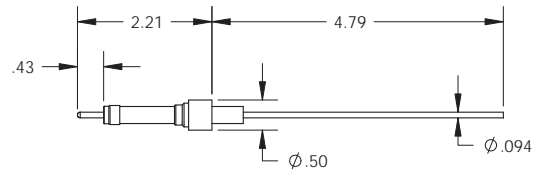
See Section 7 for connectors, wiring, and other accessories.



20,000 Volts DC / to 30 Amps / 1 to 4 Pins

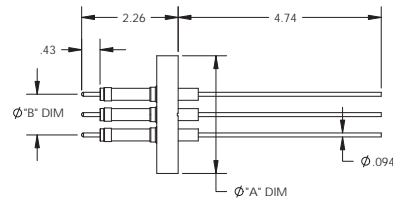
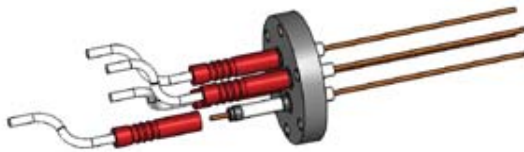
Power Glove Connector Included (96" length)

WELDABLE



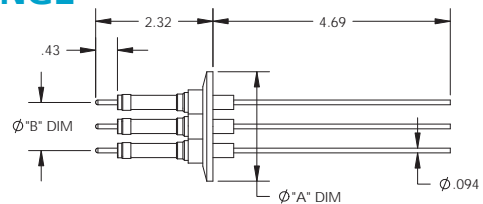
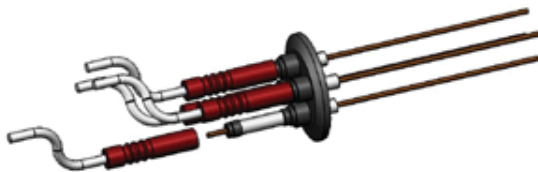
AMPS	CONDUCTOR	PART #
30	OFHC COPPER	A7501-1-W
15	NICKEL - 200	A7501-2-W
1	304 STN STL	A7501-3-W

CONFLAT FLANGE



PINS	CONDUCTOR	Ø "A" DIM	Ø "B" DIM	PART #
1	OFHC COPPER	1.33	---	A5979-1-CF
1	OFHC COPPER	2.75	---	A5980-1-CF
2	OFHC COPPER	2.75	0.95	A5981-1-CF
4	OFHC COPPER	2.75	0.95	A5982-1-CF

QUICK FLANGE



PINS	CONDUCTOR	Ø "A" DIM	Ø "B" DIM	PART #
1	OFHC COPPER	1.57	---	A5983-1-QF
1	OFHC COPPER	2.16	---	A5984-1-QF
2	OFHC COPPER	2.16	0.95	A5985-1-QF
4	OFHC COPPER	2.16	0.95	A5986-1-QF

See Section 7 for connectors, wiring, and other accessories.



COAXIAL

Coaxial is the description for electrical feedthroughs with parallel and concentric conductor paths, and with the inner most conductor path electrically isolated from the vacuum flange. Grounded Shield versions have one isolated path, and Floating Shield versions have two. Coaxial feedthroughs are single-ended or double-ended, and all types include air-side connectors.

MPF offers several mounting options for coaxial feedthroughs: Weldable, Quick Flange (QF), and Conflat Flange (CF). Most designs are also configured for Baseplate and NPT style adapters. Custom adapters, plates and flange configurations are available by request.

BNC and MHV

Bayonet Naval Connector (BNC) feedthroughs are very popular due to their quick connect coupling and compact overall size. BNC series are commonly used for low power transmission and are rated to 500 Volts DC.

Miniature High Voltage (MHV) feedthroughs are very similar to the BNC series, but the MHV series is capable of handling much higher power transmission. Although they are very similar in design, MHV and BNC connectors are not compatible. MHV feedthroughs and mating connectors are rated to 5000 Volts DC.



SHV-5 and SHV-10

Safe High Voltage (SHV) feedthroughs are like the MHV series, with the primary difference being the pin and contact configuration. SHV cable connectors have a recessed female contact which helps prevent shock hazards when the connector is disengaged.

This recessed contact design is an improvement over the MHV design, and becomes increasingly important in higher power applications. The SHV-5 and SHV-10 series are rated for up to 5 Amps and 5000 or 10,000 Volts DC respectively. Both are offered in single and double-ended versions.



SHV-20 and SHV-B

SHV-20 feedthroughs are rated for 20,000 Volts DC and up to 15 Amps. These specially designed interfaces incorporate standard high voltage contacts, and are designed for increased performance in pulsed high voltage applications.

SHV-B feedthroughs are designed for bakeout at higher temperatures than the other SHV series. The air-side cable connectors included with these feedthroughs utilize a ceramic dielectric material. SHV-B feedthroughs and connectors are rated for 7500 Volts DC and up to 3 Amps.





Type N and SMA - Standard

Type N feedthroughs combine the most popular medium-sized high frequency connector with a feedthrough designed to perform in high and ultra-high vacuum applications. The standard Type N series is suitable for use to 1 GHz. Type N feedthroughs and mating connectors are rated for 500 Volts DC and up to 3 Amps.

Subminiature Type-A (SMA) feedthroughs are compact designs suited for medium-to-high frequency applications. Similar to the Type N series, the standard SMA series is suitable for use to 1 GHz. SMA feedthroughs and connectors are rated for 700 Volts DC and up to 1 Amp. The floating shield version is rated to 2500 Volts DC.



Type N and SMA - 50 Ohm - Matched Impedance

Both Type N and SMA feedthroughs are also offered with increased signal transmission performance. These high-vacuum feedthrough designs have been engineered for improved RF performance in high frequency applications up to 8 GHz.

Unlike the standard Type N and SMA feedthroughs which are intended for UHV applications, these matched impedance versions utilize a Teflon dielectric spacer. This design parameter optimizes electrical performance but requires consideration in some vacuum environments.

High Performance SMA rated to 18 GHz also available.



Microdot and Between Series

Microdot style feedthroughs are the smallest UHV design with a threaded connector interface. This connector style is commonly used in vacuum coating applications, particularly in the construction of crystal sensor deposition monitors.

Crystal Sensor assemblies often utilize a BNC-Microdot 'between series' feedthrough, which is designed with a BNC connection on the air-side and a Microdot connection on the vacuum-side. Standard configurations available.

Type N to SMA feedthroughs are typically used in Beam Position Monitor (BPM) applications. Single, double, and custom configurations are available.

Operating Conditions

The electrical and thermal ratings specified are safe operating limits determined by various factors including material properties, mechanical design, and the intended operating environment. All electrical ratings are based on operation with one side in dry atmosphere and the other side in vacuum of 1×10^{-4} Torr maximum pressure. Temperature ratings for various mounting options may reduce the operating range of an assembly. All assemblies have a maximum thermal gradient of 25°C per minute and may be damaged if this limit is exceeded.

COAXIAL

Section 5:

Section	Type	Sub-type	Grounded / Floating Shield	Single / Double Ended
5.1	BNC		Grounded	Single / Double
			Floating	Single / Double
5.2	MHV		Grounded	Single / Double
			Floating	Single / Double
5.3	SHV	SHV-5	Grounded	Single / Double
		SHV-5	Floating	Single
		SHV-10	Grounded	Single / Double
		SHV-20	Grounded	Single
		SHV-B	Grounded	Single
5.4	Type N	Standard	Grounded	Single
		High Frequency	Grounded	Single / Double
5.5	SMA	Standard	Grounded	Single
		Standard	Floating	Single
		High Frequency	Grounded	Single / Double
5.6	Microdot		Grounded	Single
5.7	Between Series	BNC to Microdot	Grounded	Double
		Type N to SMA	Grounded	Double

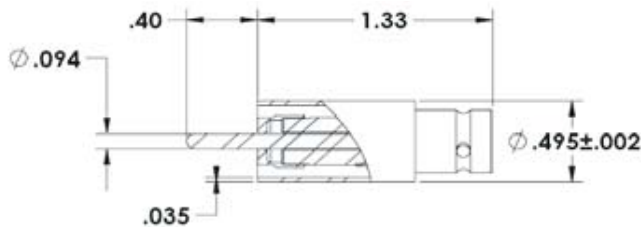
Contents

Electrical Rating	Thermal Rating	Conductor	Impedance	Pages
Voltage: 500 Volts DC Current: 3 Amps	Feedthrough: -200 to 450°C Air-side Connector: -65 to 165°C	304 Stainless Steel	Non-constant	124-135
Voltage: 2500 Volts DC Current: 3 Amps	Feedthrough: -200 to 450°C Air-side Connector: -65 to 165°C	304 Stainless Steel	Non-constant	
Voltage: 5000 Volts DC Current: 3 Amps	Feedthrough: -200 to 450°C Air-side Connector: -65 to 165°C	304 Stainless Steel	Non-constant	136-146
Voltage: 2500 Volts DC Current: 3 Amps	Feedthrough: -200 to 450°C Air-side Connector: -65 to 165°C	304 Stainless Steel	Non-constant	
Voltage: 5000 Volts DC Current: 5 Amps	Feedthrough: -200 to 450°C Air-side Connector: -65 to 165°C	Nickel	Non-constant	147-163
Voltage: 2500 Volts DC Current: 5 Amps	Feedthrough: -200 to 450°C Air-side Connector: -65 to 165°C	Nickel	Non-constant	
Voltage: 10,000 Volts DC Current: 5 Amps	Feedthrough: -200 to 450°C Air-side Connector: -65 to 165°C	Nickel	Non-constant	
Voltage: 20,000 Volts DC Current: 15 Amps	Feedthrough: -200 to 450°C Air-side Connector: -65 to 165°C	Nickel	Non-constant	
Voltage: 7500 Volts DC Current: 3 Amps	Feedthrough: -200 to 450°C Air-side Connector: -200 to 300°C	304 Stainless Steel	Non-constant	
Voltage: 500 Volts DC Current: 3 Amps	Feedthrough: -200 to 450°C Air-side Connector: -65 to 165°C	304 Stainless Steel	Non-constant	164-166
Voltage: 500 Volts DC Current: 3 Amps	Feedthrough: -200 to 450°C Air-side Connector: -65 to 165°C	304 Stainless Steel	50 Ohms	
Voltage: 700 Volts DC Current: 1 Amp	Feedthrough: -200 to 450°C Air-side Connector: -65 to 165°C	304 Stainless Steel	Non-constant	167-171
Voltage: 2500 Volts DC Current: 1 Amp	Feedthrough: -200 to 450°C Air-side Connector: -65 to 165°C	304 Stainless Steel	Non-constant	
Voltage: 700 Volts DC Current: 1 Amp	Feedthrough: -200 to 450°C Air-side Connector: -65 to 165°C	304 Stainless Steel	50 Ohms	
Voltage: 500 Volts DC Current: 2 Amps	Feedthrough: -200 to 450°C Air-side Connector: -65 to 165°C	Molybdenum	Non-constant	172
Voltage: 500 Volts DC Current: 2 Amps	Feedthrough: -200 to 450°C Air-side Connector: -65 to 165°C	304 Stainless Steel	Non-constant	173-177
Voltage: 500 Volts DC Current: 1 Amp	Feedthrough: -200 to 450°C Air-side Connector: -65 to 165°C	304 Stainless Steel	Non-constant	

BNC

500 Volts DC / 3 Amps
Air-side Connector Included

Grounded Shield – Single-ended WELDABLE

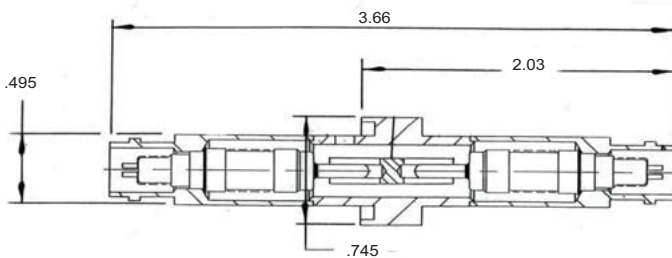


PART #

A0059-1-W

A0059-2-W (w/o connector)

Grounded Shield – Double-ended WELDABLE



PART #

A0471-1-W

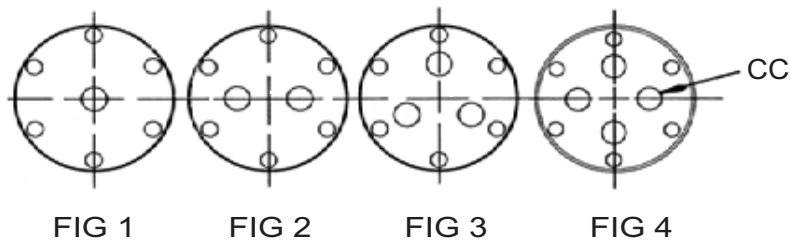
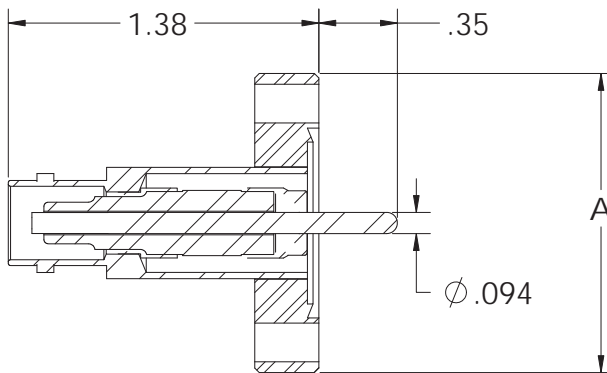
See Section 7 for connectors, wiring, and other accessories.



BNC

500 Volts DC / 3 Amps
Air-side Connector Included

Grounded Shield – Single-ended
CONFLAT FLANGE



PINS	FIG	CF FLANGE	A	CC	PART #
1	1	CF16	1.33	---	A0237-1-CF
1	1	CF40	2.75	---	A0289-1-CF
2	2	CF40	2.75	.75	A0291-1-CF
3	3	CF40	2.75	.95	A0293-1-CF
4	4	CF40	2.75	.95	A0295-1-CF

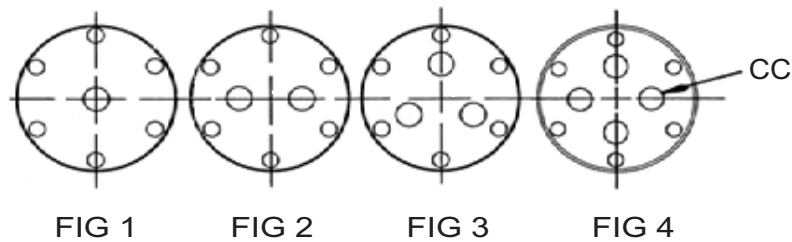
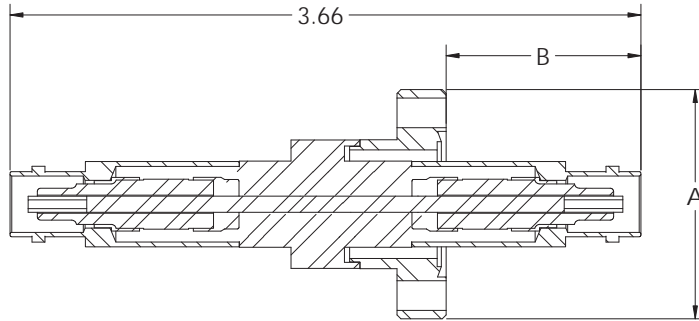
See Section 7 for connectors, wiring, and other accessories.



BNC

500 Volts DC / 3 Amps
Air-side Connector Included

Grounded Shield – Double-ended **CONFLAT FLANGE**



PINS	FIG	CF FLANGE	A	B	CC	PART #
1	1	CF16	1.33	1.14	---	A0472-1-CF
1	1	CF40	2.75	1.58	---	A0473-1-CF
2	2	CF40	2.75	1.58	.75	A0473-3-CF
3	3	CF50	3.38	1.58	.95	A0473-5-CF
4	4	CF63	4.50	1.58	.95	A7231-1-CF

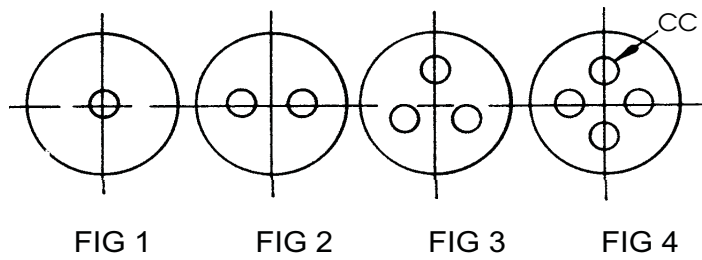
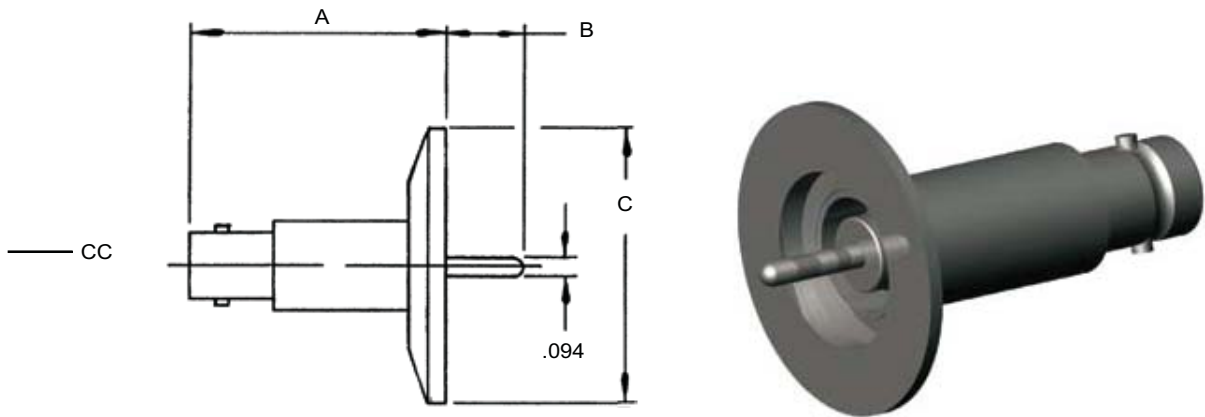
See Section 7 for connectors, wiring, and other accessories.



BNC

500 Volts DC / 3 Amps
Air-side Connector Included

Grounded Shield – Single-ended **QUICK FLANGE**



PINS	FIG	A	B	C	CC	PART #
1	1	1.43	.30	1.18	---	A0476-1-QF
1	1	1.33	.40	2.16	---	A0476-2-QF
2	2	1.33	.40	2.16	.75	A0476-3-QF
3	3	1.33	.40	2.95	.95	A0476-4-QF
4	4	1.33	.40	2.16	.75	A6984-1-QF
4	4	1.33	.40	2.95	.95	A0476-5-QF

See Section 7 for connectors, wiring, and other accessories.



BNC

500 Volts DC / 3 Amps

Air-side Connector Included

Grounded Shield – Double-ended

QUICK FLANGE

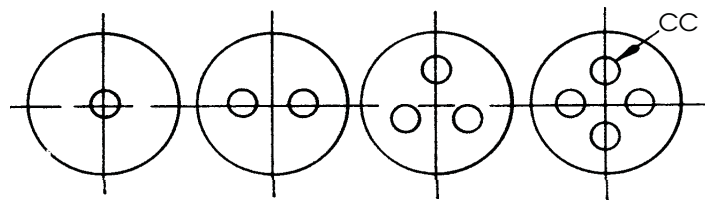
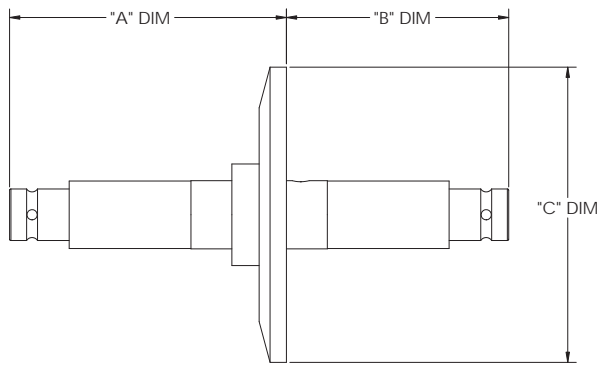


FIG 1

FIG 2

FIG 3

FIG 4

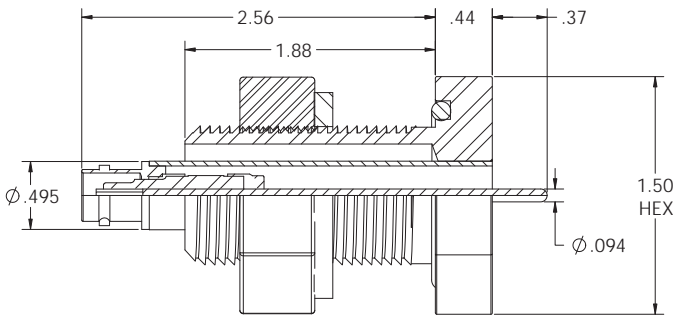
PINS	FIG	A	B	C	CC	PART #
1	1	1.13	2.53	1.18	---	A0479-1-QF
1	1	2.03	1.63	2.16	---	A0478-3-QF
2	2	2.03	1.63	2.95	.75	A0478-5-QF
3	3	2.03	1.63	2.95	.95	A0478-7-QF
4	4	2.03	1.63	2.95	.95	A7111-1-QF

See Section 7 for connectors, wiring, and other accessories.



BNC
500 Volts DC / 3 Amps
Air-side Connector Included

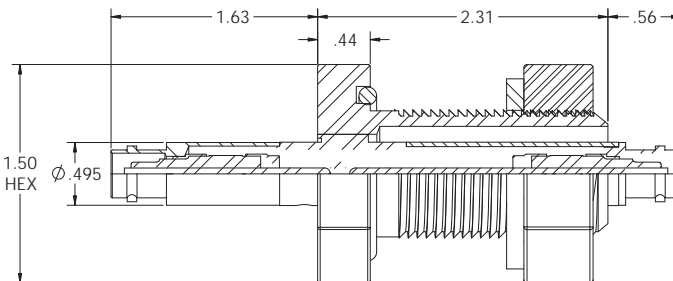
Grounded Shield
1" BASEPLATE



PART #

A0482-2-BP

Grounded Shield — Double-ended
1" BASEPLATE



PART #

A0484-1-BP

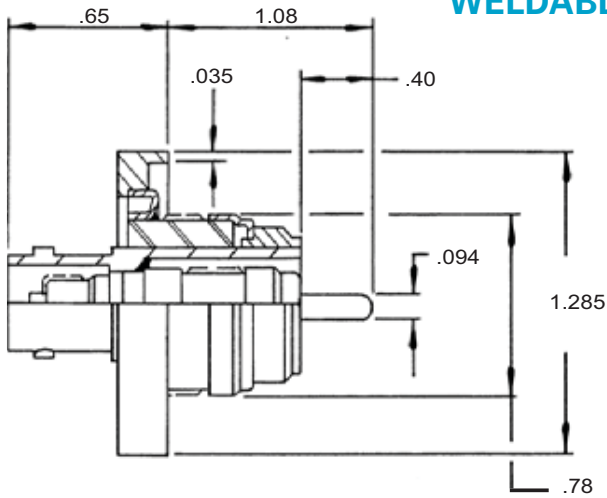
See Section 7 for connectors, wiring, and other accessories.



BNC

500 Volts DC / 3 Amps
Air-side Connector Included

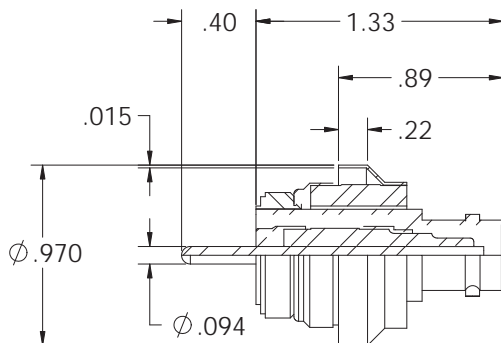
Floating Shield WELDABLE



PART #

A0302-1-W

Floating Shield WELDABLE



PART #

A1301-1-W

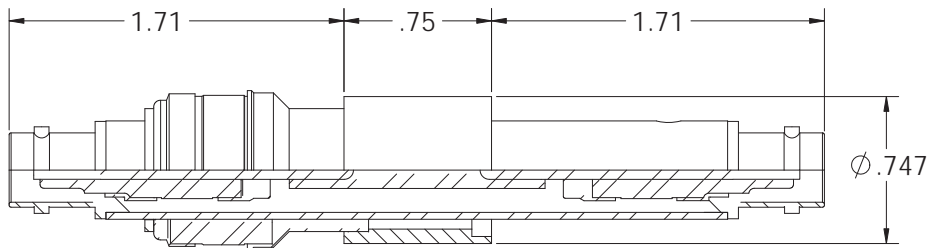
See Section 7 for connectors, wiring, and other accessories.



BNC

500 Volts DC / 3 Amps
Air-side Connector Included

Floating Shield – Double-ended
WELDABLE



PART #

A0466-1-W

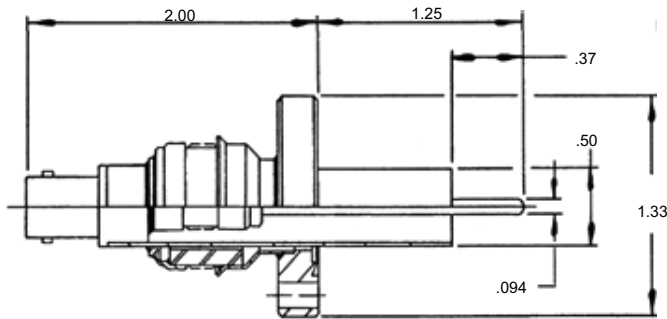
See Section 7 for connectors, wiring, and other accessories.



BNC

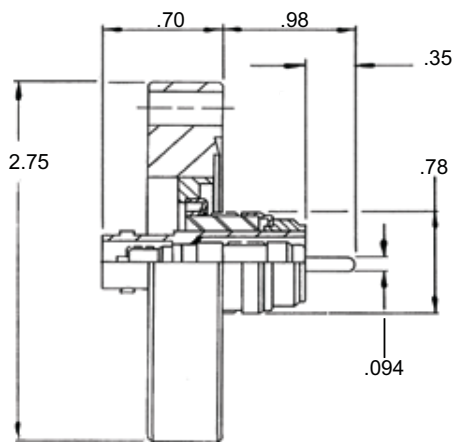
500 Volts DC / 3 Amps
Air-side Connector Included

Floating Shield – Single-ended CONFLAT FLANGE



PART #

A0310-1-CF



PART #

A0304-1-CF

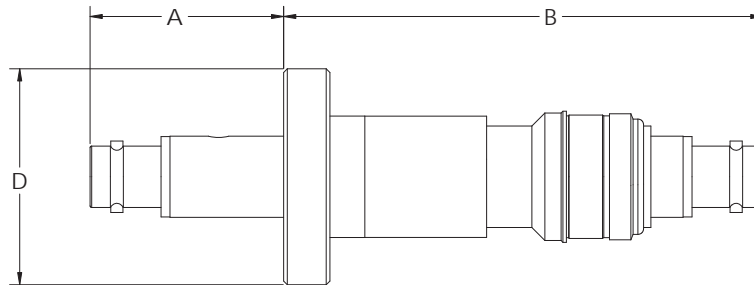
See Section 7 for connectors, wiring, and other accessories.



BNC

500 Volts DC / 3 Amps
Air-side Connector Included

Floating Shield – Double-ended
CONFLAT FLANGE



PINS	CF FLANGE	A	B	D	PART #
1	CF16	1.21	2.96	1.33	A0474-1-CF
1	CF40	1.66	2.51	2.75	A0475-1-CF

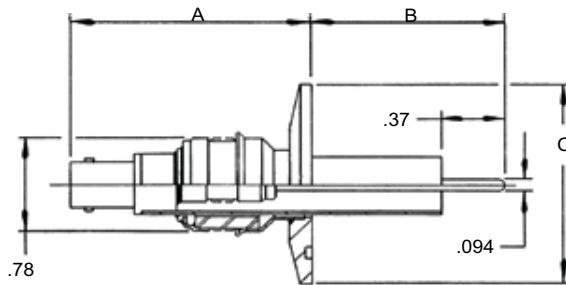
See Section 7 for connectors, wiring, and other accessories.



BNC

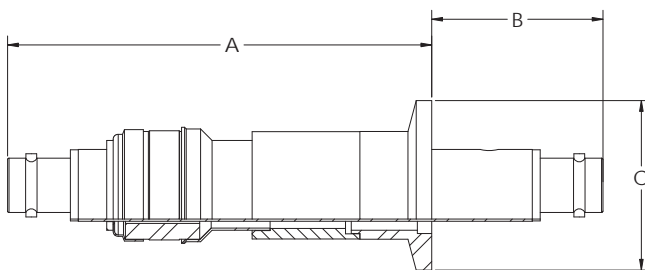
500 Volts DC / 3 Amps
Air-side Connector Included

Floating Shield – Single-ended **QUICK FLANGE**



PINS	A	B	C	PART #
1	2.59	0.67	1.18	A0315-1-QF
1	2.09	1.17	2.16	A0315-3-QF

Floating Shield – Double-ended **QUICK FLANGE**



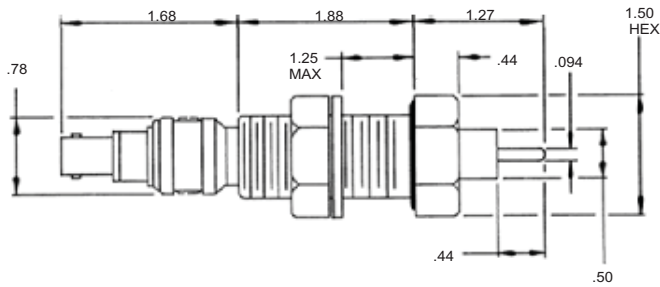
PINS	A	B	C	PART #
1	2.96	1.21	1.18	A0480-1-QF
1	2.46	1.71	2.16	A0481-1-QF

See Section 7 for connectors, wiring, and other accessories.



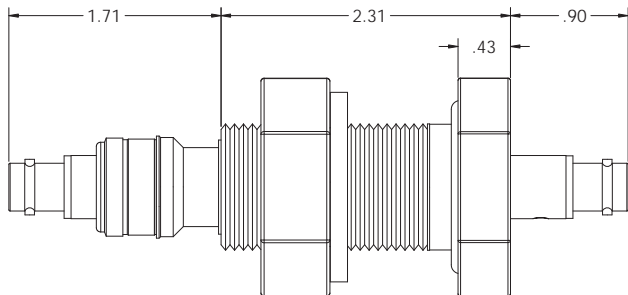
BNC
500 Volts DC / 3 Amps
Air-side Connector Included

Floating Shield
1" BASEPLATE



PART #
 A0485-1-BP

Floating Shield – Double-ended
1" BASEPLATE



PART #
 A0487-1-BP

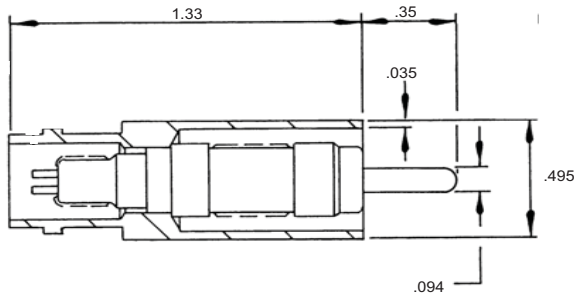
See Section 7 for connectors, wiring, and other accessories.



MHV

5000 Volts DC / 3 Amps
Air-side Connector Included

Grounded Shield WELDABLE

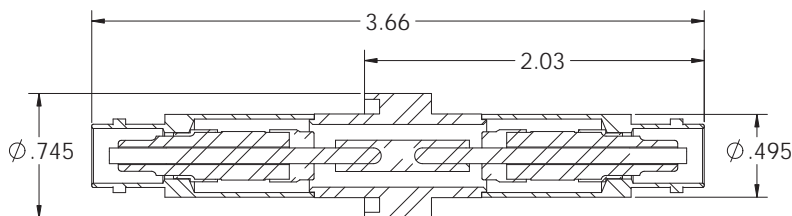


PART #

A0058-1-W

A0058-2-W (w/o connector)

Grounded Shield – Double-ended WELDABLE



PART #

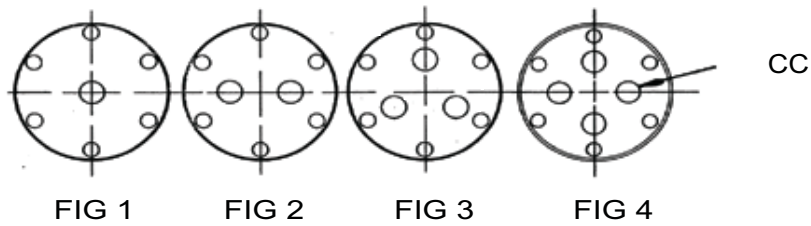
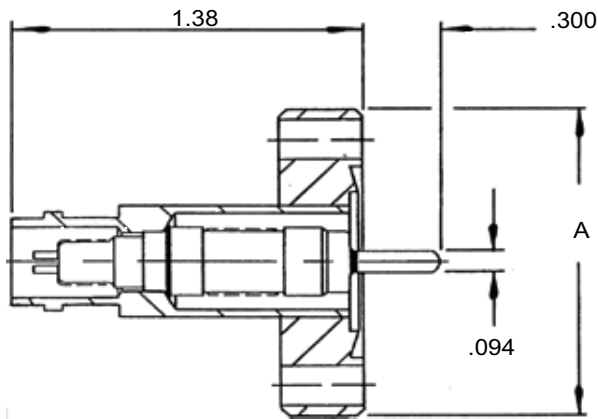
A0471-2-W

See Section 7 for connectors, wiring, and other accessories.



MHV
5000 Volts DC / 3 Amps
Air-side Connector Included

Grounded Shield – Single-ended
CONFLAT FLANGE



PINS	CF FLANGE	A	CC	PART #
1	CF16	1.33	---	A0238-1-CF
1	CF40	2.75	---	A0290-1-CF
2	CF40	2.75	.75	A0292-1-CF
3	CF40	2.75	.95	A0294-1-CF
4	CF40	2.75	.95	A0296-1-CF

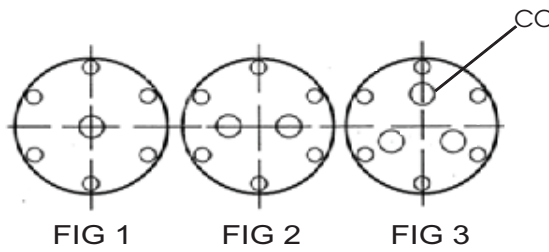
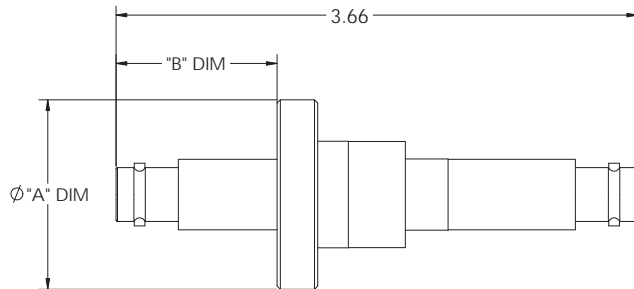
See Section 7 for connectors, wiring, and other accessories.



MHV

5000 Volts DC / 3 Amps
Air-side Connector Included

Grounded Shield – Double-ended CONFLAT FLANGE



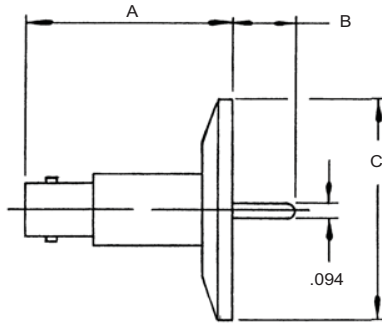
PINS	FIG	CF FLANGE	A	B	CC	PART #
1	1	CF16	1.33	1.13	---	A0472-2-CF
1	1	CF40	2.75	1.58	---	A0473-2-CF
2	2	CF40	2.75	1.58	.75	A0473-4-CF
3	3	CF50	3.38	1.58	.95	A0473-6-CF

See Section 7 for connectors, wiring, and other accessories.



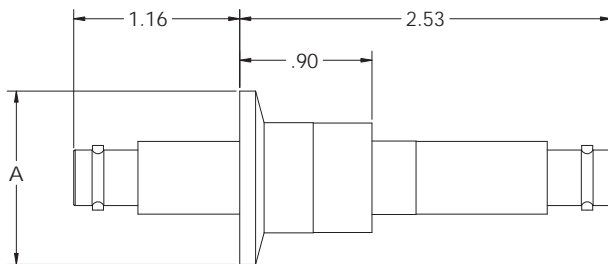
MHV
5000 Volts DC / 3 Amps
Air-side Connector Included

Grounded Shield – Single-ended
QUICK FLANGE



PINS	A	B	C	CC	PART #
1	1.43	.25	1.18	---	A0477-1-QF
1	1.33	.35	2.16	---	A0477-2-QF
2	1.33	.35	2.16	.75	A0477-3-QF
3	1.33	.35	2.95	.95	A0477-4-QF
4	1.33	.35	2.16	.75	A6984-2-QF
4	1.33	.35	2.95	.95	A0477-5-QF

Grounded Shield – Double-ended
QUICK FLANGE



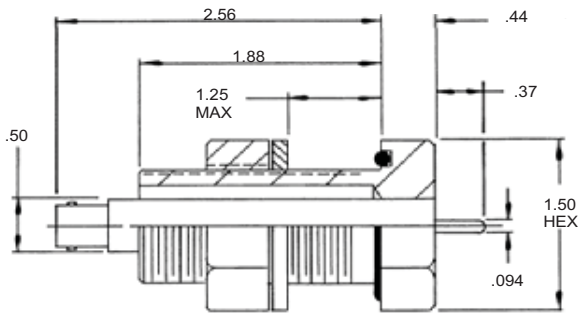
PINS	A	CC	PART #
1	1.18	---	A0479-2-QF
1	2.16	---	A0478-4-QF
2	2.16	.75	A0478-10-QF
3	2.95	.95	A0478-8-QF

See Section 7 for connectors, wiring, and other accessories.



MHV 5000 Volts DC / 3 Amps *Air-side Connector Included*

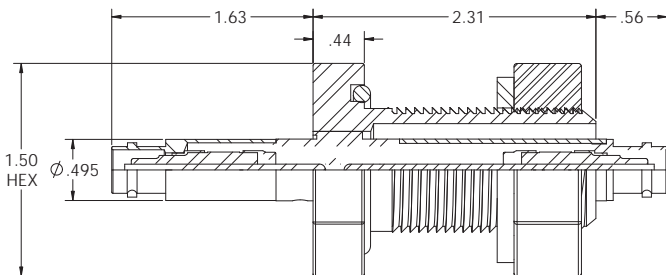
Grounded Shield – Single-ended 1" BASEPLATE



PART #

A0482-1-BP

Grounded Shield – Double-ended 1" BASEPLATE



PART #

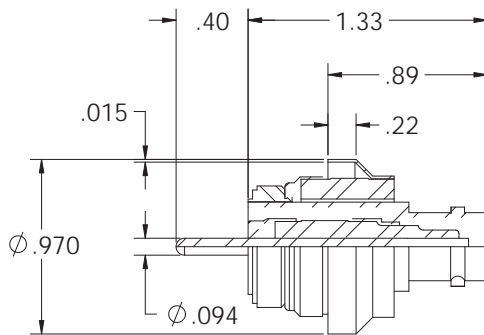
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See Section 7 for connectors, wiring, and other accessories.

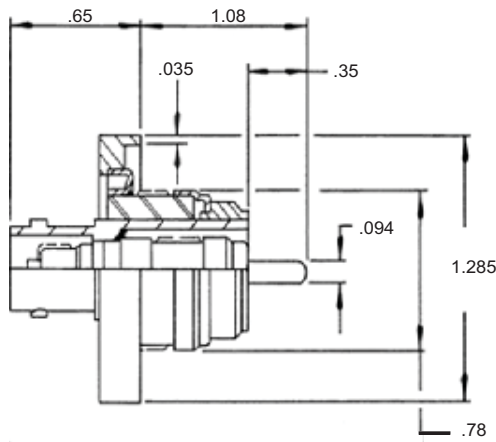


MHV
5000 Volts DC / 3 Amps
Air-side Connector Included

Floating Shield – Single-ended
WELDABLE



PART #
A1301-3-W



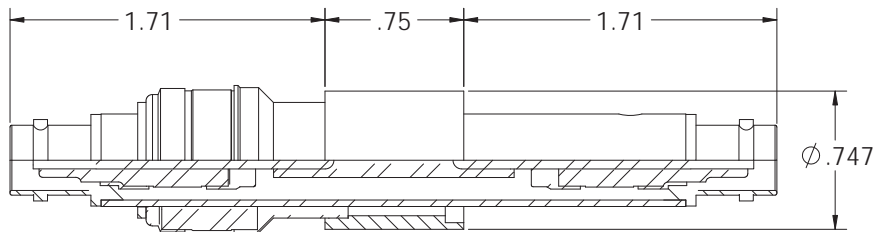
PART #
A0303-1-W



MHV

5000 Volts DC / 3 Amps
Air-side Connector Included

Floating Shield – Double-ended
WELDABLE



PART #

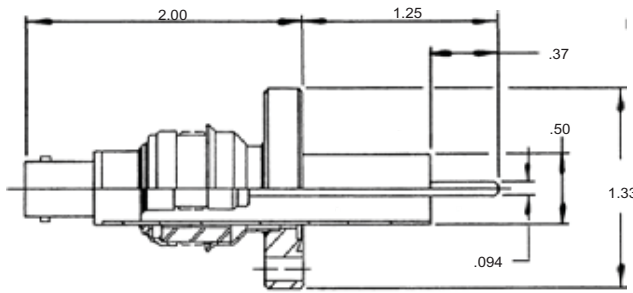
A0466-2-W

See Section 7 for connectors, wiring, and other accessories.



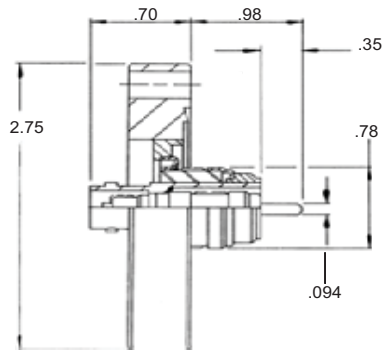
MHV
5000 Volts DC / 3 Amps
Air-side Connector Included

Floating Shield – Single-ended
CONFLAT FLANGE



PART #

A0311-1-CF



PART #

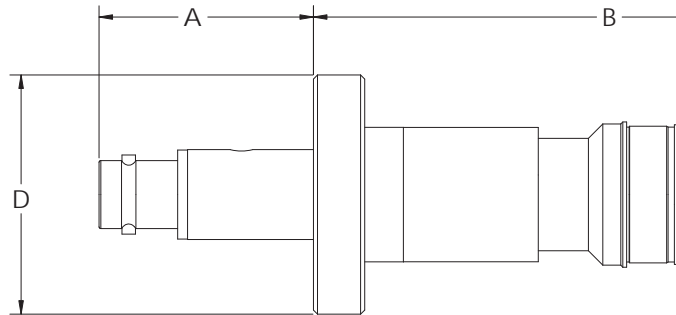
A0305-1-CF

See Section 7 for connectors, wiring, and other accessories.



MHV
5000 Volts DC / 3 Amps
Air-side Connector Included

Floating Shield – Double-ended
CONFLAT FLANGE



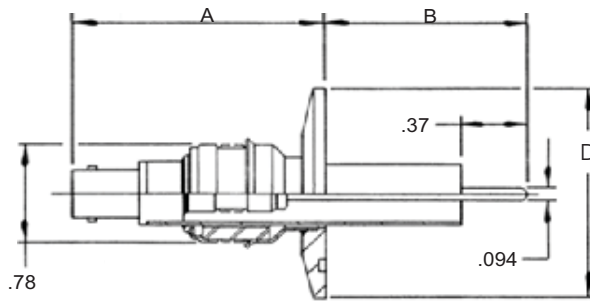
PINS	CF FLANGE	A	B	D	PART #
1	CF16	1.21	2.96	1.33	A0474-2-CF
1	CF40	1.66	2.51	2.75	A0475-2-CF

See Section 7 for connectors, wiring, and other accessories.



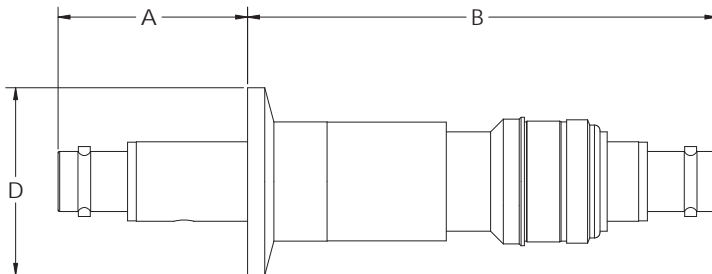
MHV
5000 Volts DC / 3 Amps
Air-side Connector Included

Floating Shield – Single-ended
QUICK FLANGE



PINS	A	B	D	PART #
1	2.59	.67	1.18	A0316-1-QF
1	2.09	1.17	2.16	A0316-3-QF

Floating Shield – Double-ended
QUICK FLANGE



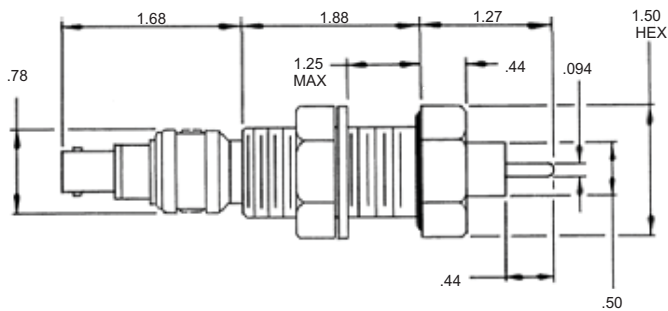
PINS	A	B	D	PART #
1	1.21	2.96	1.18	A0480-2-QF
1	1.71	2.46	2.16	A0481-2-QF

See Section 7 for connectors, wiring, and other accessories.



MHV 5000 Volts DC / 3 Amps *Air-side Connector Included*

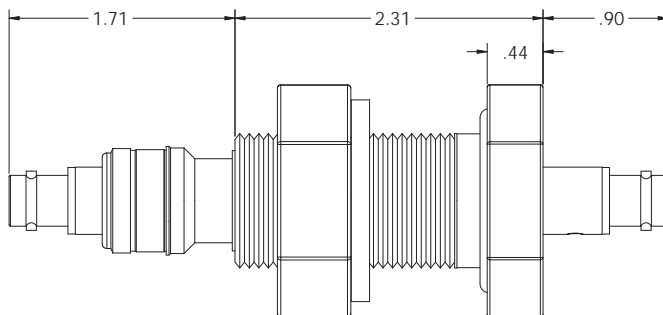
Floating Shield – Single-ended 1" BASEPLATE



PART #

A0485-2-BP

Floating Shield – Double-ended 1" BASEPLATE



PART #

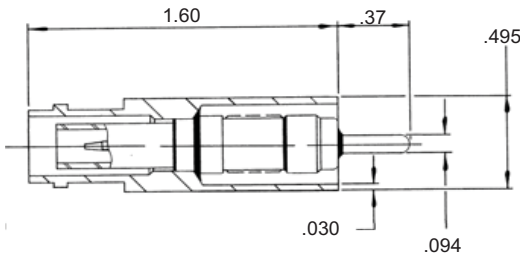
A0487-2-BP

See Section 7 for connectors, wiring, and other accessories.



SHV-5
5000 Volts DC / 5 Amps
Air-side Connector Included

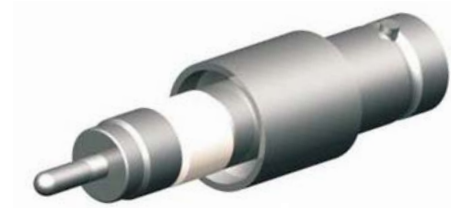
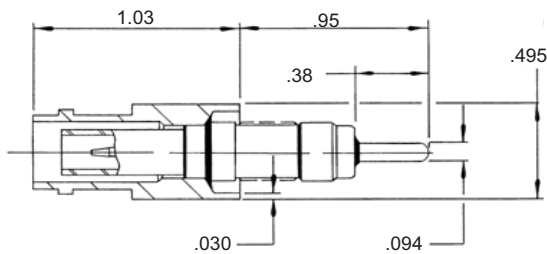
Grounded Shield – Recessed
WELDABLE



PART #

A0152-1-W

Grounded Shield – Exposed
WELDABLE



PART #

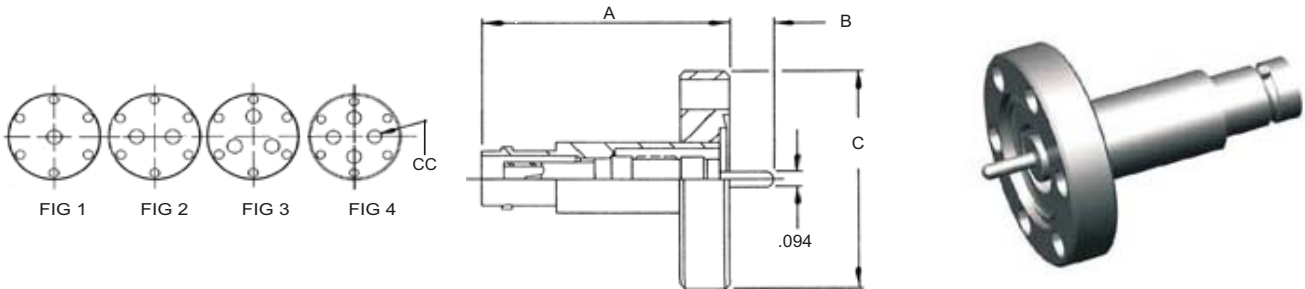
A0328-1-W

See Section 7 for connectors, wiring, and other accessories.



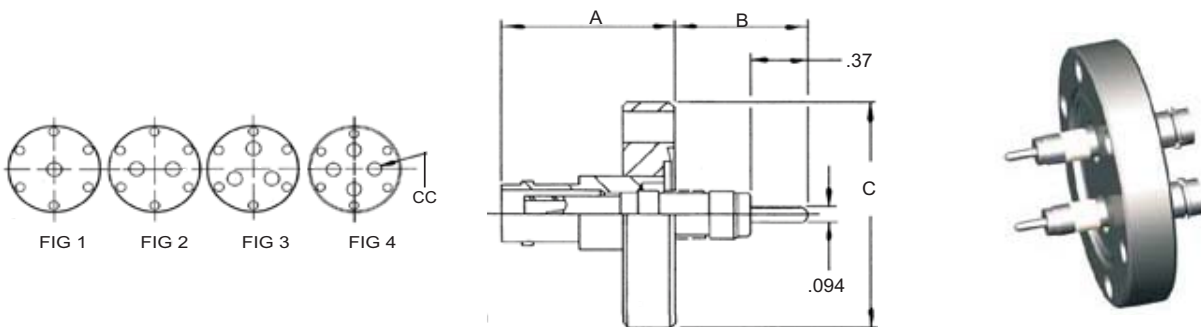
SHV-5 5000 Volts DC / 5 Amps *Air-side Connector Included*

Grounded Shield – Recessed CONFLAT FLANGE



PINS	FIG	A	B	C	CC	PART #
1	1	1.65	.32	1.33	---	A0330-1-CF
1	1	1.65	.32	2.75	---	A0331-1-CF
2	2	1.65	.32	2.75	.75	A0332-1-CF
3	3	1.65	.32	2.75	.95	A0333-1-CF
4	4	1.65	.32	2.75	.95	A0334-1-CF

Grounded Shield – Exposed CONFLAT FLANGE



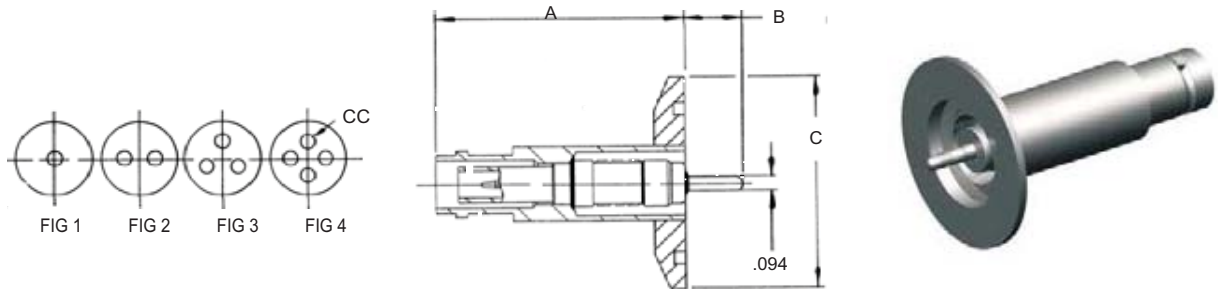
PINS	FIG	A	B	C	CC	PART #
1	1	1.08	.86	1.33	---	A0335-1-CF
1	1	1.08	.86	2.75	---	A0336-1-CF
2	2	1.08	.86	2.75	.75	A0337-1-CF
3	3	1.08	.86	2.75	.95	A0338-1-CF
4	4	1.08	.86	2.75	.95	A0339-1-CF

See Section 7 for connectors, wiring, and other accessories.



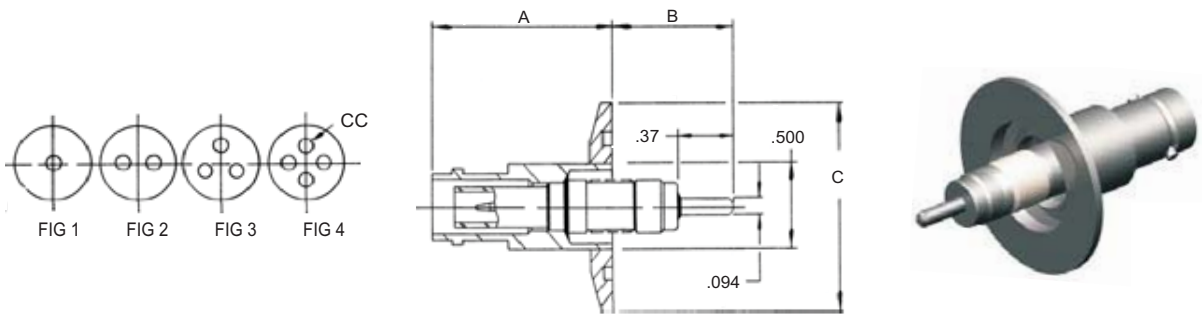
SHV-5
5000 Volts DC / 5 Amps
Air-side Connector Included

Grounded Shield – Recessed
QUICK FLANGE



PINS	FIG	A	B	C	CC	PART #
1	1	1.70	.27	1.18	---	A0340-1-QF
1	1	1.60	.37	2.16	---	A0341-1-QF
2	2	1.60	.37	2.16	.75	A0342-1-QF
3	3	1.60	.37	2.95	.95	A0343-1-QF
4	4	1.60	.37	2.16	.75	A6984-3-QF
4	4	1.60	.37	2.95	.95	A0344-1-QF

Grounded Shield – Exposed
QUICK FLANGE



PINS	FIG	A	B	C	CC	PART #
1	1	1.13	.81	1.18	---	A0345-1-QF
1	1	1.03	.91	2.16	---	A0346-1-QF
2	2	1.03	.91	2.16	.75	A0347-1-QF
3	3	1.03	.91	2.95	.95	A0348-1-QF
4	4	1.03	.91	2.95	.95	A0349-1-QF

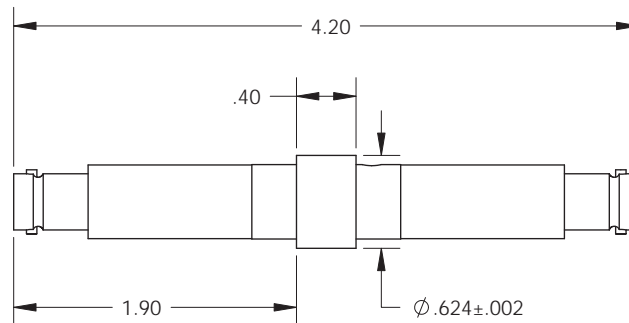
See Section 7 for connectors, wiring, and other accessories.



SHV-5

5000 Volts DC / 5 Amps
Air-side Connector Included

Grounded Shield – Double-ended
WELDABLE



PART #

A0858-1-W

See Section 7 for connectors, wiring, and other accessories.



SHV-5
5000 Volts DC / 5 Amps
Air-side Connector Included

Grounded Shield – Double-ended
CONFLAT FLANGE

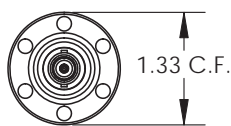
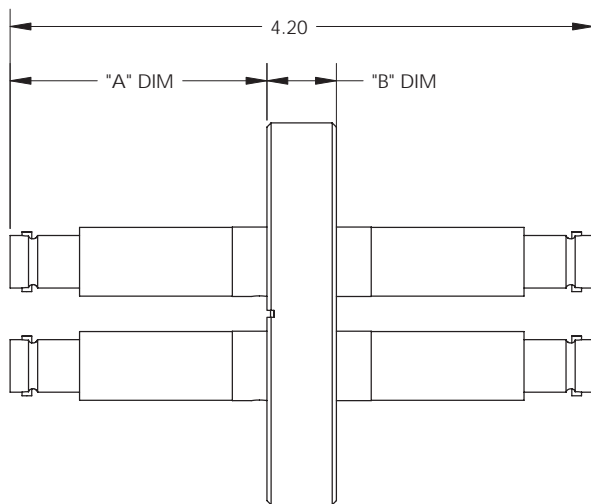


Fig. 1

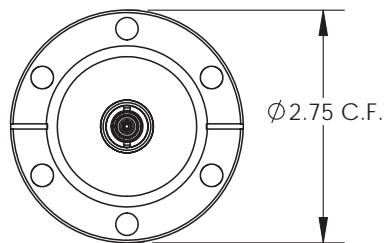


Fig. 2

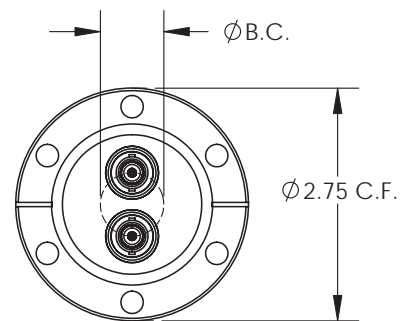


Fig. 3

FIG	PINS	Ø B.C.	"A" DIM	"B" DIM	PART #
1	1	---	1.40	.285	A0472-5-CF
2	1	---	1.85	.500	A0473-7-CF
3	2	.75	1.85	.500	A0473-8-CF

See Section 7 for connectors, wiring, and other accessories.



SHV-5 5000 Volts DC / 5 Amps *Air-side Connector Included*

Grounded Shield – Double-ended QUICK FLANGE

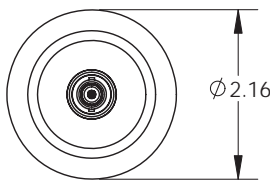
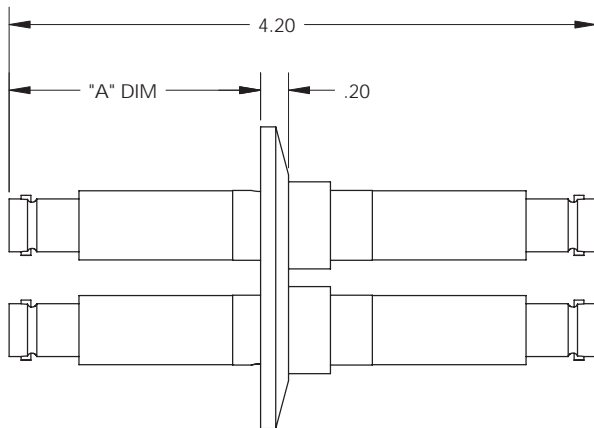


Fig. 1

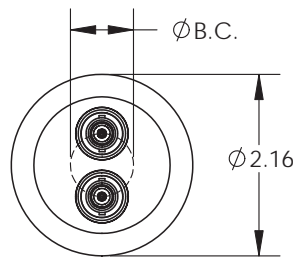


Fig. 2

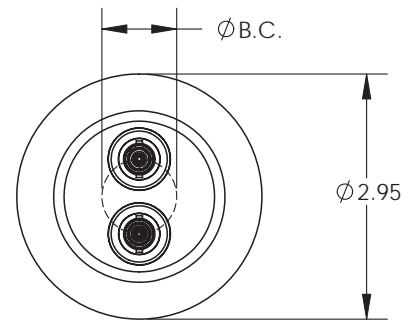


Fig. 3

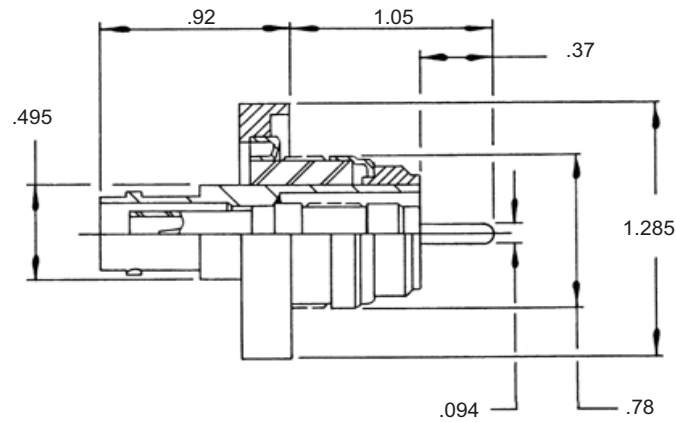
FIG	PINS	Ø B.C.	"A" DIM	PART #
1	1	---	1.80	A8271-1-QF
2	2	.75	1.80	A0859-1-QF
3	2	.90	1.90	A6974-1-QF

See Section 7 for connectors, wiring, and other accessories.



SHV-5
5000 Volts DC / 5 Amps
Air-side Connector Included

Floating Shield – Single-ended
WELDABLE



PART #

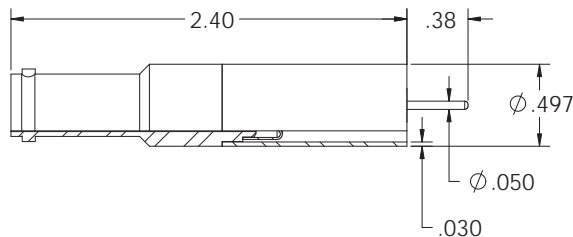
A0329-1-W

See Section 7 for connectors, wiring, and other accessories.



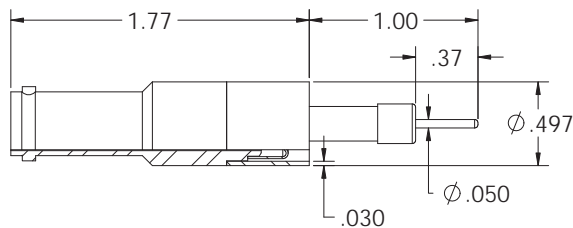
SHV-10 10,000 Volts DC / 5 Amps *Air-side Connector Included*

Grounded Shield — Recessed **WELDABLE**



TYPE	PART #
RECESSED	A1499-1-W

Grounded Shield — Exposed **WELDABLE**



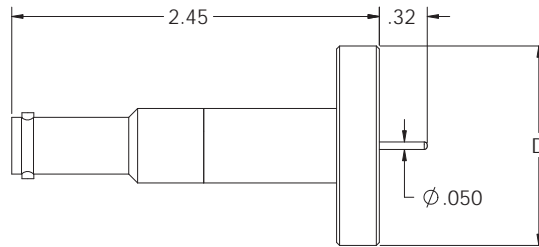
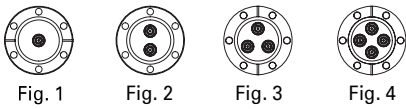
TYPE	PART #
EXPOSED	A1497-1-W

See Section 7 for connectors, wiring, and other accessories.



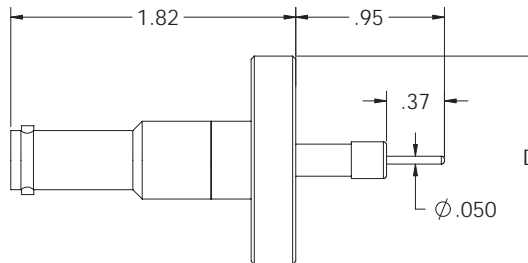
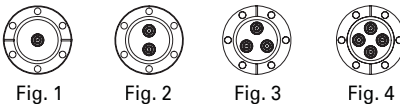
SHV-10
10,000 Volts DC / 5 Amps
Air-side Connector Included

Grounded Shield – Recessed
CONFLAT FLANGE



PINS	FIG	D	CC	PART #
1	1	1.33 / CF16	---	A1600-1-CF
1	1	2.75 / CF40	---	A1600-2-CF
2	2	2.75 / CF40	.75	A1600-3-CF
3	3	2.75 / CF40	.75	A1600-4-CF
4	4	2.75 / CF40	.95	A1600-5-CF

Grounded Shield – Exposed
CONFLAT FLANGE



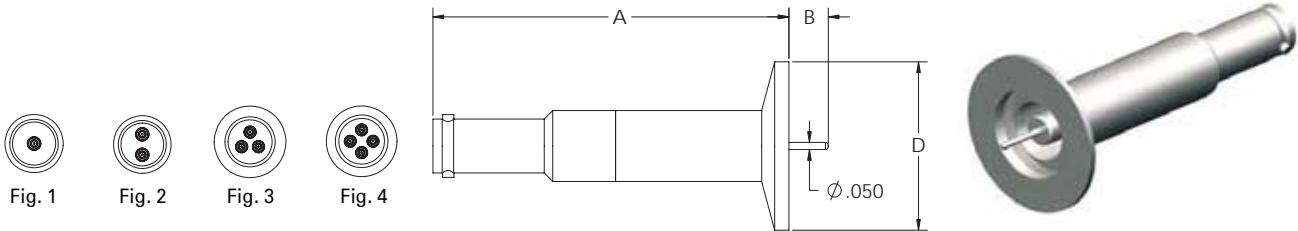
PINS	FIG	D	CC	PART #
1	1	1.33 / CF16	---	A1601-1-CF
1	1	2.75 / CF40	---	A1601-2-CF
2	2	2.75 / CF40	.75	A1601-3-CF
3	3	2.75 / CF40	.75	A1601-4-CF
4	4	2.75 / CF40	.95	A1601-5-CF

See Section 7 for connectors, wiring, and other accessories.



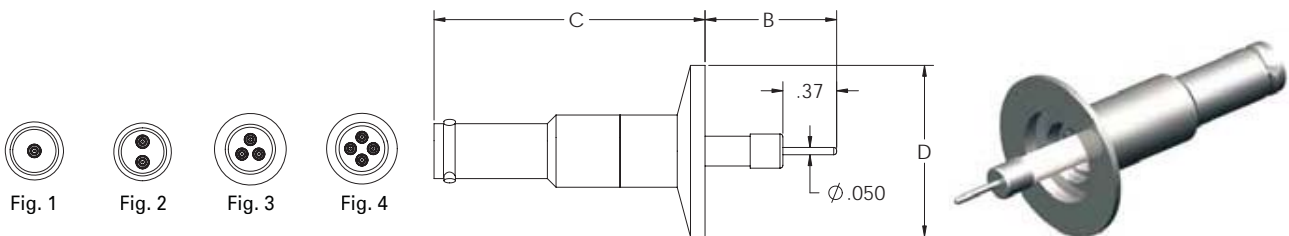
SHV-10 10,000 Volts DC / 5 Amps *Air-side Connector Included*

Grounded Shield — Recessed QUICK FLANGE



PINS	FIG	A	B	D	CC	PART #
1	1	2.49	.28	1.18 / QF16	---	A1602-1-QF
1	1	2.39	.28	2.16 / QF40	---	A1602-2-QF
2	2	2.39	.28	2.16 / QF40	.75	A1602-3-QF
3	3	2.39	.28	2.95 / QF50	.75	A1602-4-QF
4	4	2.39	.28	2.95 / QF50	.95	A1602-5-QF

Grounded Shield — Exposed QUICK FLANGE



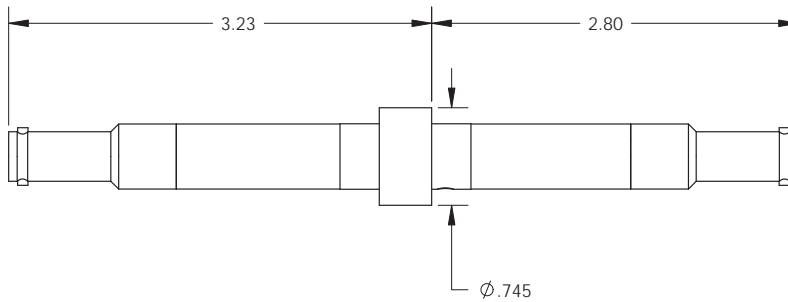
PINS	FIG	B	C	D	CC	PART #
1	1	1.87	.90	1.18 / QF16	---	A1603-1-QF
1	1	1.77	1.00	2.16 / QF40	---	A1603-2-QF
2	2	1.77	1.00	2.16 / QF40	.75	A1603-3-QF
3	3	1.77	1.00	2.95 / QF50	.75	A1603-4-QF
4	4	1.77	1.00	2.95 / QF50	.95	A1603-5-QF

See Section 7 for connectors, wiring, and other accessories.



SHV-10
10,000 Volts DC / 5 Amps
Air-side Connector Included

Grounded Shield – Double-ended
WELDABLE



PART #

A2613-3-W

See Section 7 for connectors, wiring, and other accessories.



SHV-10 10,000 Volts DC / 5 Amps *Air-side Connector Included*

Grounded Shield – Double-ended CONFLAT FLANGE

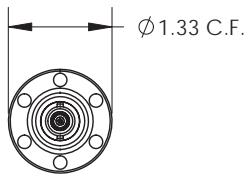
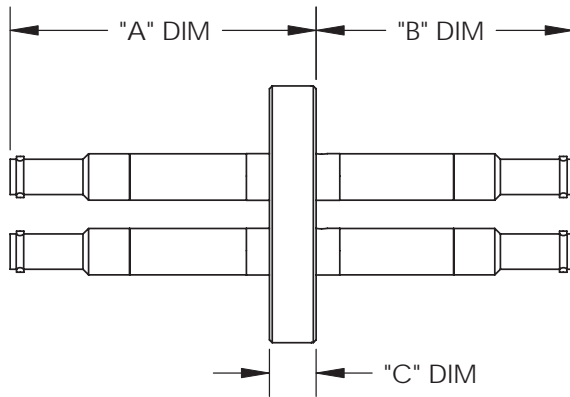


Fig. 1

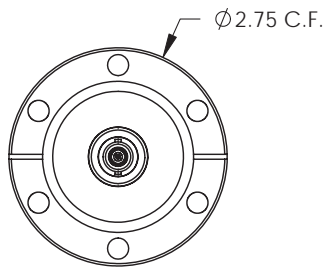


Fig. 2

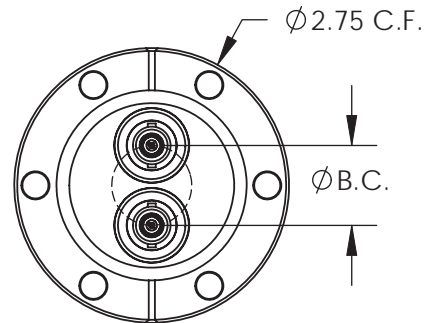


Fig. 3

FIG	PINS	Ø B.C.	"A" DIM	"B" DIM	"C" DIM	PART #
1	1	---	3.73	2.30	.285	A8272-1-CF
2	1	---	3.28	2.75	.500	A8272-2-CF
3	2	.80	3.28	2.75	.500	A8272-3-CF

See Section 7 for connectors, wiring, and other accessories.



SHV-10
10,000 Volts DC / 5 Amps
Air-side Connector Included

Grounded Shield – Double-ended
QUICK FLANGE

Fig. 1

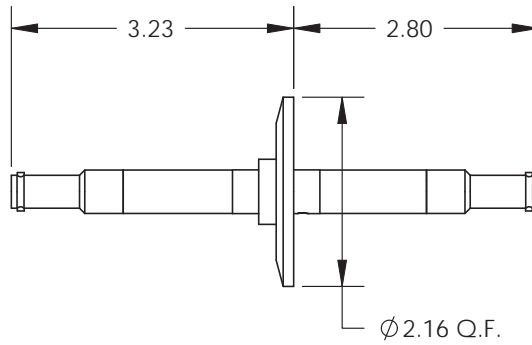


Fig. 2

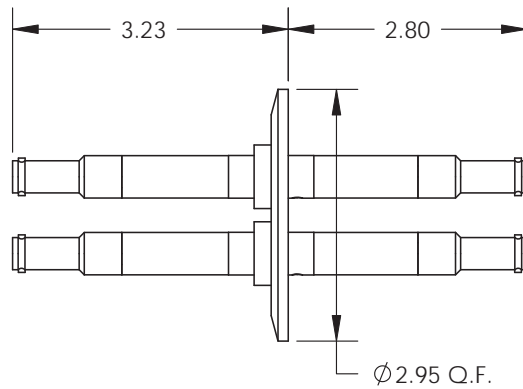


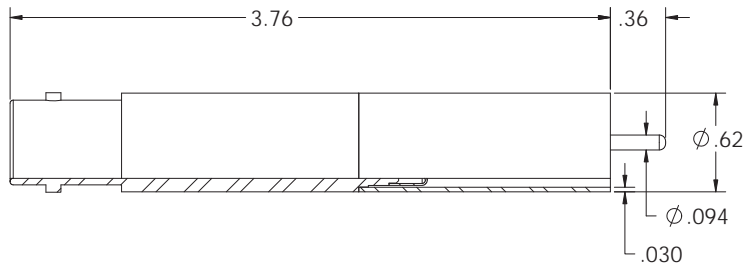
FIG	PINS	PART #
1	1	A8273-1-QF
2	2	A8273-2-QF

See Section 7 for connectors, wiring, and other accessories.



SHV-20 20,000 Volts DC / 15 Amps *Air-side Connector Included*

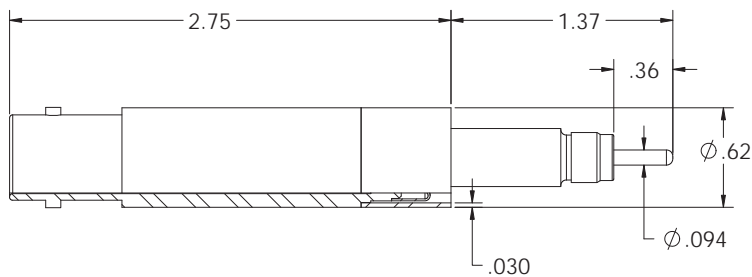
Grounded Shield — Recessed **WELDABLE**



PART #

A0701-1-W

Grounded Shield — Exposed **WELDABLE**



PART #

A0702-1-W

See Section 7 for connectors, wiring, and other accessories.



SHV-20
20,000 Volts DC / 15 Amps
Air-side Connector Included

Grounded Shield – Recessed and Exposed
CONFLAT FLANGE

Fig. 1

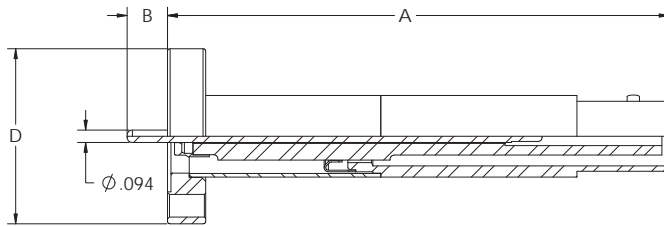
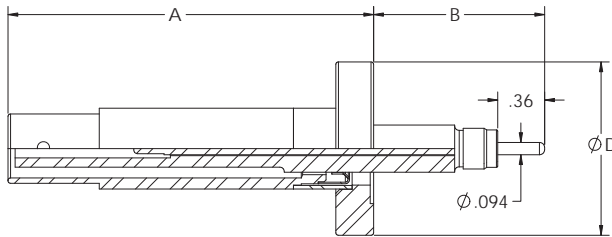


Fig. 2



PINS	FIG	TYPE	A	B	D	CC	PART #
1	1	RECESSED	3.80	.32	1.33 / CF16	---	A0703-1-CF
1	1	RECESSED	3.80	.32	2.75 / CF40	---	A2095-1-CF
2	1	RECESSED	3.80	.32	2.75 / CF40	.95	A2300-1-CF
1	2	EXPOSED	2.80	1.32	1.33 / CF16	---	A0704-1-CF
1	2	EXPOSED	2.80	1.32	2.75 / CF40	---	A1909-1-CF
2	2	EXPOSED	2.80	1.32	2.75 / CF40	.95	A2099-1-CF

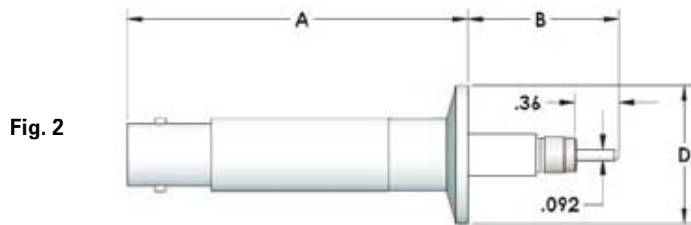
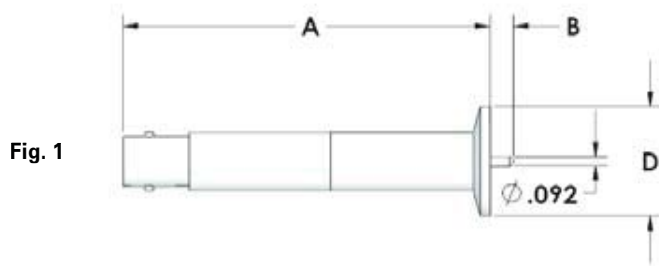
See Section 7 for connectors, wiring, and other accessories.



SHV-20

20,000 Volts DC / 15 Amps
Air-side Connector Included

Grounded Shield – Recessed and Exposed QUICK FLANGE



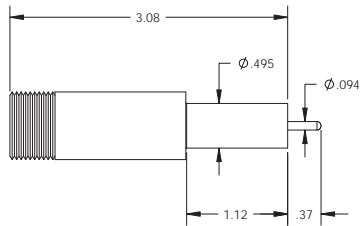
PINS	FIG	TYPE	A	B	D	CC	PART #
1	1	RECESSED	3.85	.27	1.18 / QF16	---	A2096-1-QF
1	1	RECESSED	3.80	.37	2.16 / QF40	---	A2096-2-QF
2	2	RECESSED	3.80	.37	2.95 / QF50	.95	A2302-1-QF
1	1	EXPOSED	2.85	1.27	1.18 / QF16	---	A2094-1-QF
1	1	EXPOSED	2.75	1.37	2.16 / QF40	---	A2094-2-QF
2	2	EXPOSED	2.75	1.37	2.95 / QF50	.95	A2301-1-QF

See Section 7 for connectors, wiring, and other accessories.



SHV-B
7500 Volts DC / 3 Amps
Bakeable Connector
Air-side Connector Included

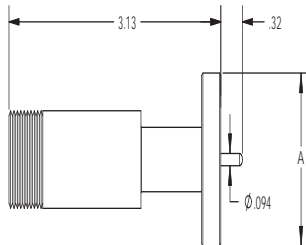
WELDABLE



PART #

A0836-1-W

CONFLAT FLANGE

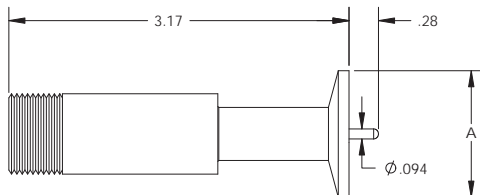


A **PART #**

1.33 A1051-1-CF

2.75 A1051-2-CF

QUICK FLANGE



A **PART #**

1.18 A2610-1-QF

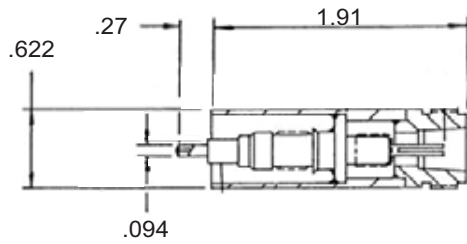
2.16 A2611-2-QF

See Section 7 for connectors, wiring, and other accessories.

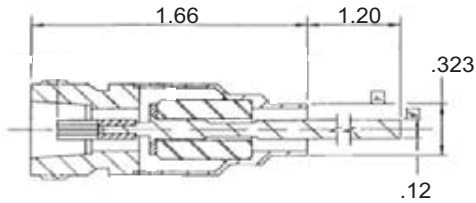


TYPE-N

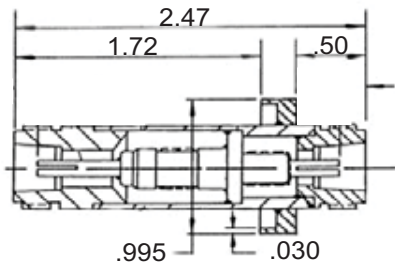
500 Volts DC / 3 Amps
Air-side Connector Included
WELDABLE



TYPE	PART #
SINGLE-ENDED	A0654-1-W



TYPE	PART #
SINGLE-ENDED / 50 Ohms	A0655-1-W

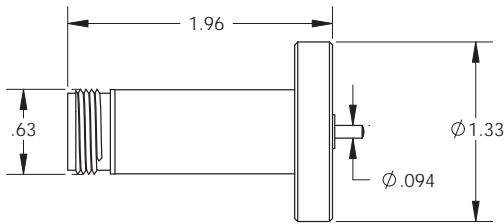


TYPE	PART #
DOUBLE-ENDED	A0659-1-W

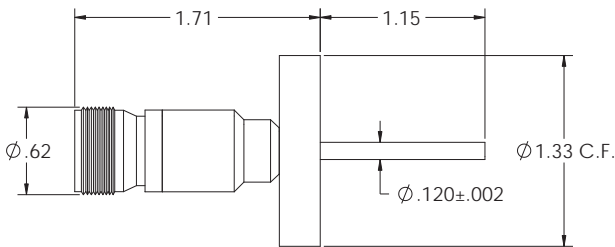
See Section 7 for connectors, wiring, and other accessories.



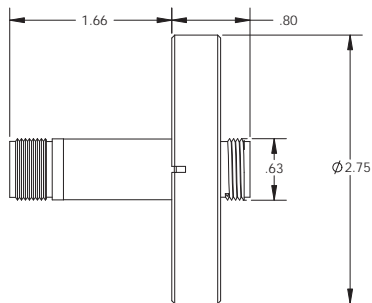
TYPE-N
500 Volts DC / 3 Amps
Air-side Connector Included
CONFLAT FLANGE



TYPE	PART #
SINGLE-ENDED	A1706-1-CF



TYPE	PART #
SINGLE-ENDED / 50 Ohms	A2714-1-CF



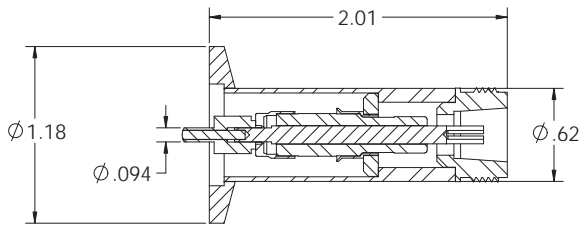
TYPE	PART #
DOUBLE-ENDED	A2262-1-CF

See Section 7 for connectors, wiring, and other accessories.

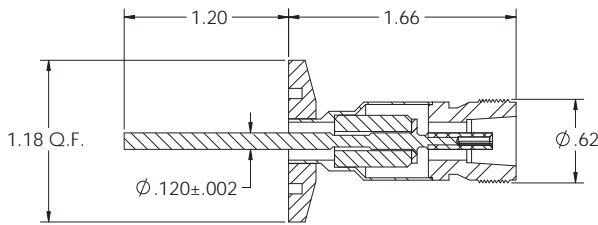


TYPE-N

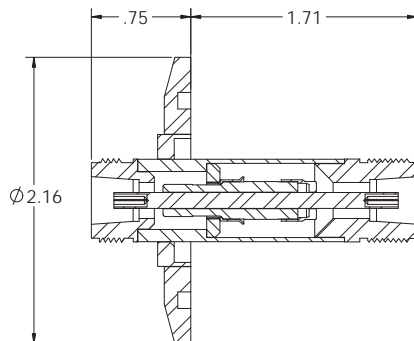
500 Volts DC / 3 Amps
Air-side Connector Included
QUICK FLANGE



TYPE	PART #
SINGLE-ENDED	A2247-1-QF



TYPE	PART #
SINGLE-ENDED / 50 Ohms	A3062-1-QF

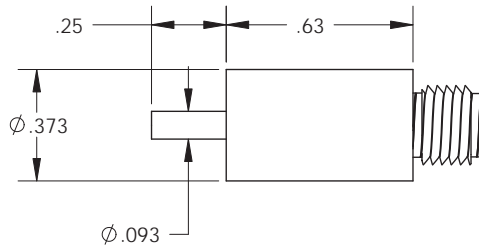


TYPE	PART #
DOUBLE-ENDED	A2604-1-QF

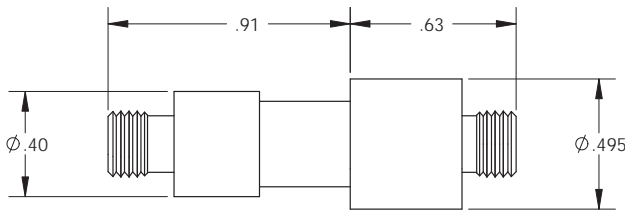
See Section 7 for connectors, wiring, and other accessories.



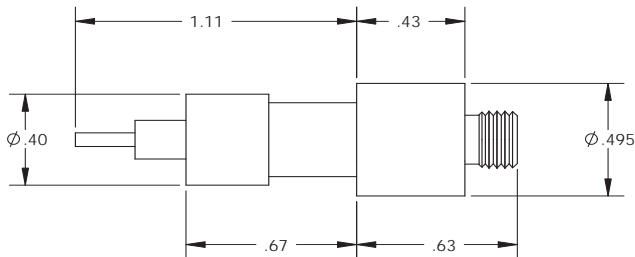
SMA
700 Volts DC / 1 Amp
Air-side Connector Included
WELDABLE



TYPE	PART #
SINGLE-ENDED	A0660-1-W



TYPE	PART #
DOUBLE-ENDED / 50 Ohms	A0645-1-W



TYPE	PART #
SINGLE-ENDED / 50 Ohms	A1908-1-W

See Section 7 for connectors, wiring, and other accessories.

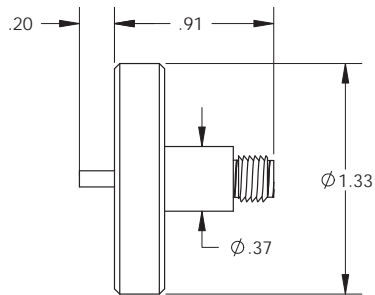


SMA

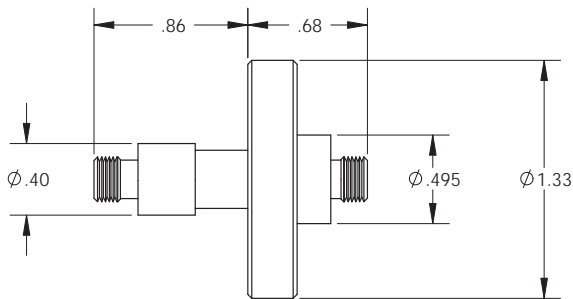
700 Volts DC / 1 Amp

Air-side Connector Included

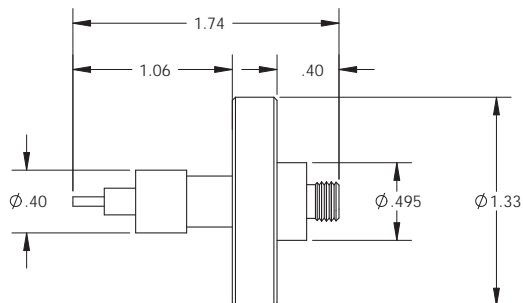
CONFLAT FLANGE



TYPE	PART #
SINGLE-ENDED	A1911-2-CF



TYPE	PART #
DOUBLE-ENDED / 50 Ohms	A1835-1-CF

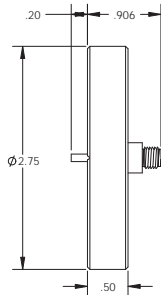


TYPE	PART #
SINGLE-ENDED / 50 Ohms	A1921-1-CF

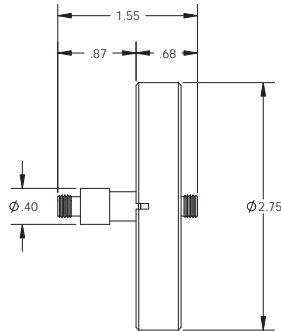
See Section 7 for connectors, wiring, and other accessories.



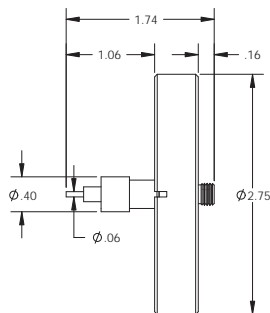
SMA
700 Volts DC / 1 Amp
Air-side Connector Included
CONFLAT FLANGE



TYPE	PART #
SINGLE-ENDED	A1911-1-CF



TYPE	PART #
DOUBLE-ENDED / 50 Ohms	A2286-1-CF



TYPE	PART #
SINGLE-ENDED / 50 Ohms	A1910-1-CF

See Section 7 for connectors, wiring, and other accessories.

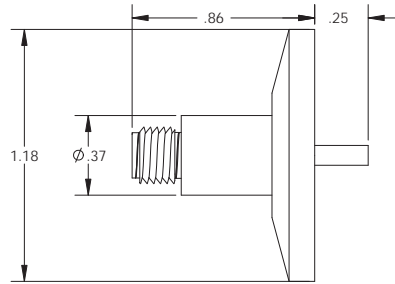


SMA

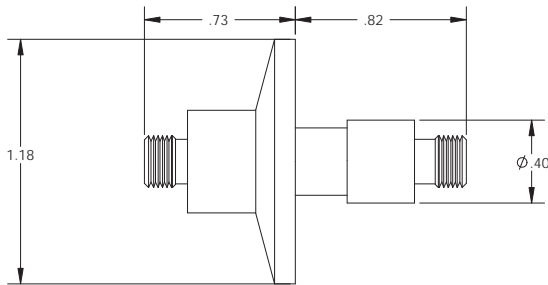
700 Volts DC / 1 Amp

Air-side Connector Included

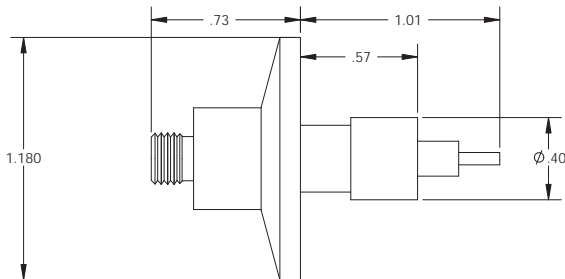
QUICK FLANGE



TYPE	PART #
SINGLE-ENDED	A1920-1-QF



TYPE	PART #
DOUBLE-ENDED / 50 Ohms	A2127-1-QF

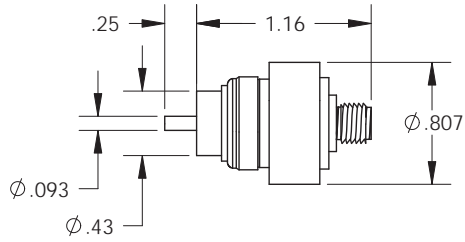


TYPE	PART #
SINGLE-ENDED / 50 Ohms	A1922-1-QF

See Section 7 for connectors, wiring, and other accessories.

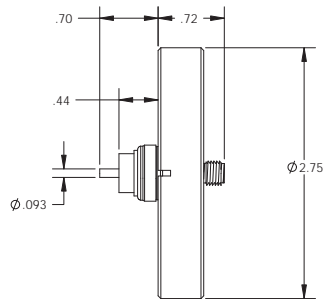


SMA
700 Volts DC / 1 Amp
Air-side Connector Included
WELDABLE



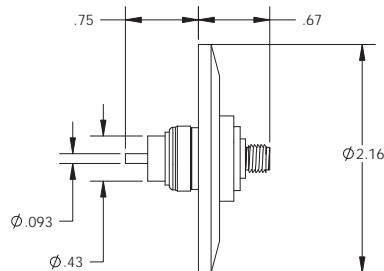
TYPE	PART #
SINGLE-ENDED	A1980-1-W

CONFLAT FLANGE



TYPE	PART #
SINGLE-ENDED	A1983-1-CF

QUICK FLANGE



TYPE	PART #
SINGLE-ENDED	A1984-1-QF

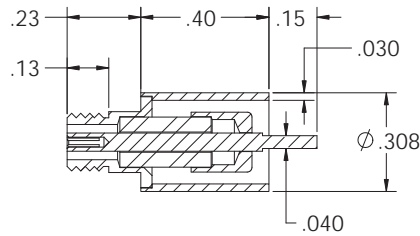
See Section 7 for connectors, wiring, and other accessories.



MICRODOT

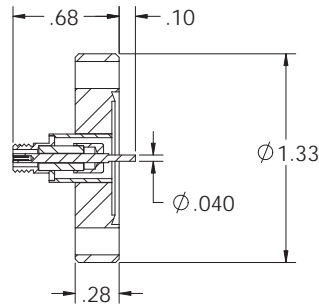
500 Volts DC / 2 Amps
Air-side Connector Included

WELDABLE



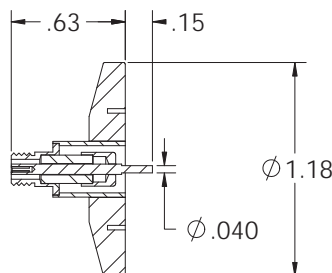
TYPE	PART #
SINGLE-ENDED	A1634-1-W

CONFLAT FLANGE



TYPE	PART #
SINGLE-ENDED	A1648-1-CF

QUICK FLANGE



TYPE	PART #
SINGLE-ENDED	A1649-1-QF

See Section 7 for connectors, wiring, and other accessories.



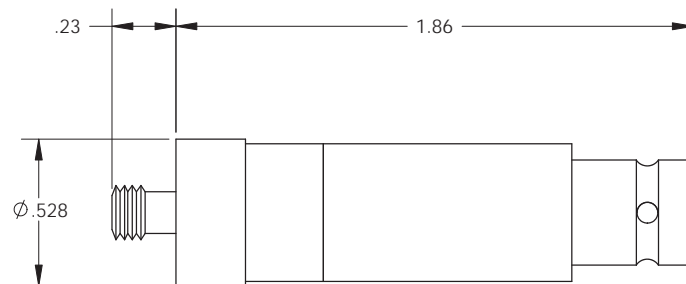
BETWEEN SERIES COAXIAL

500 Volts DC / 2 Amps

Air-side Connector Included

BNC to Microdot / Crystal Sensor Feedthrough

WELDABLE



TYPE	PART #
SINGLE-ENDED	A0975-1-W

See Section 7 for connectors, wiring, and other accessories.



BETWEEN SERIES COAXIAL

500 Volts DC / 2 Amps

Air-side Connector Included

BNC to Microdot / Crystal Sensor Feedthrough

CONFLAT FLANGE

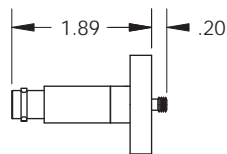


Fig. 1

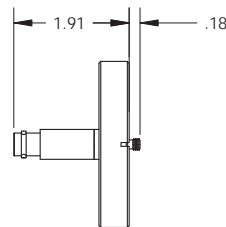
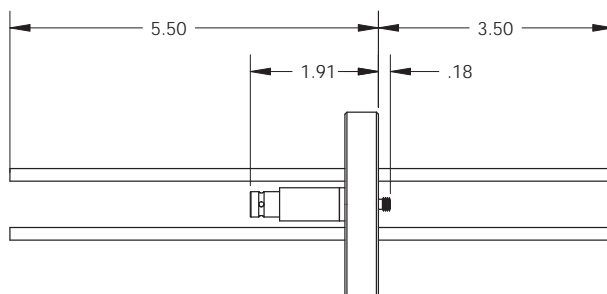


Fig. 2

PART #	FIG	COAX	COOLING LINES	FLANGE
A2554-1-CF	1	1	---	1.33 CF
A2750-1-CF	2	1	---	2.75 CF



PART #	COAX	COOLING LINES	FLANGE
A2728-1-CF	1	2	2.75 CF

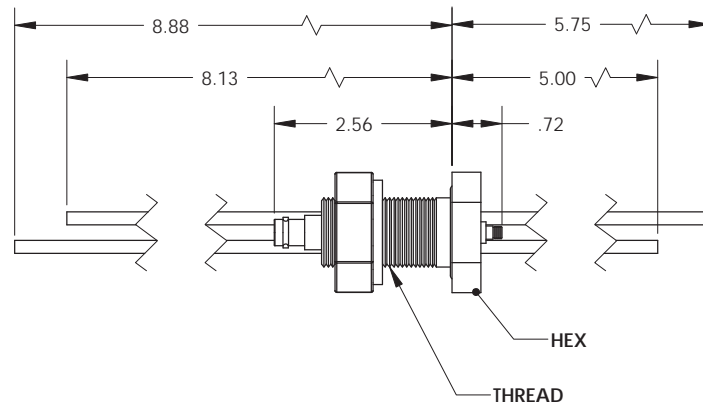
See Section 7 for connectors, wiring, and other accessories.



BETWEEN SERIES COAXIAL

500 Volts DC / 2 Amps
Air-side Connector Included

BNC to Microdot / Crystal Sensor Feedthrough
BASEPLATE



PART #	COAX	COOLING LINES	MOUNT
A7164-1-BP	1	2	1" BP

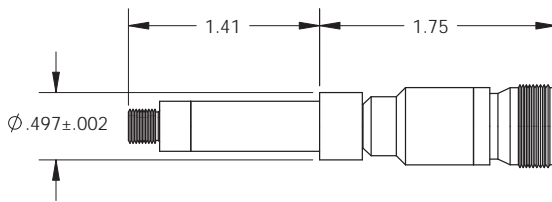
See Section 7 for connectors, wiring, and other accessories.



BETWEEN SERIES COAXIAL

500 Volts DC / 1 Amp
Air-side Connector Included

Type N to SMA WELDABLE



PART #

A3888-1-W

CONFLAT FLANGE

Fig. 1

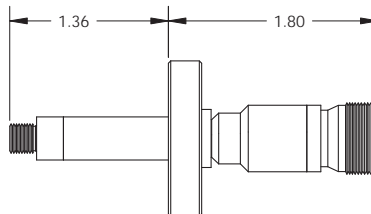
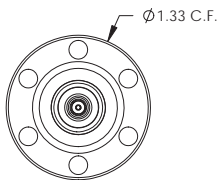


Fig. 2

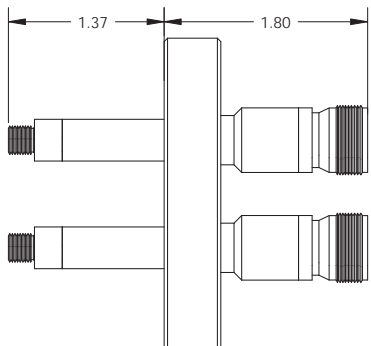
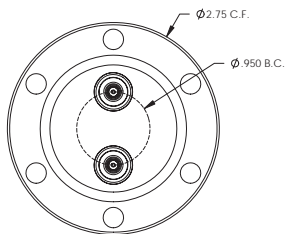


FIG	FLANGE	PART #
1	1.33 CF	A8223-1-CF
2	2.75 CF	A3892-1-CF

See Section 7 for connectors, wiring, and other accessories.



BETWEEN SERIES COAXIAL

500 Volts DC / 1 Amp
Air-side Connector Included

Type N to SMA QUICK FLANGE

Fig. 1

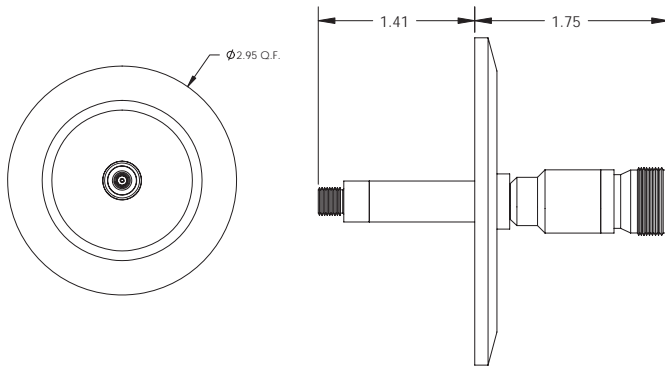


Fig. 2

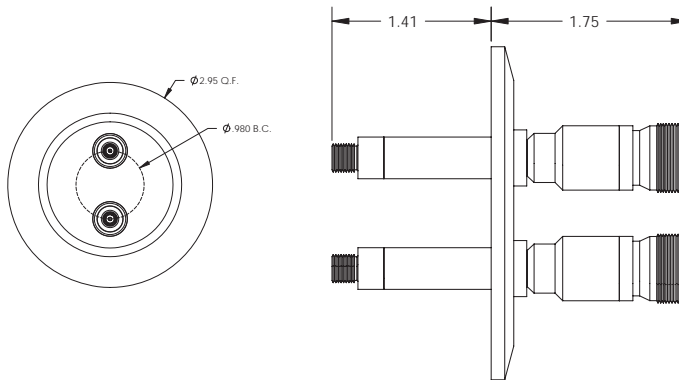


FIG	FLANGE	PART #
1	QF 50	A8224-1-QF
2	QF 50	A8224-2-QF

See Section 7 for connectors, wiring, and other accessories.



BREAKS

Breaks are tubular electrical isolators which are composed of metal adapters brazed to both ends of a ceramic insulator. These assemblies are used primarily for voltage isolation. Assemblies with inner diameters less than 2.5 inches are typically referred to as breaks, and those with larger inner diameters are called envelopes.

MPF offers several mounting options for breaks and envelopes: Weldable, Quick Flange (QF), and Conflat Flange (CF). Custom adapters, plates, and flange configurations are available by request.

Cryogenic Breaks

Electrical breaks are often required in transmission lines for cryogenic fluid. Several standard designs are offered which are safe to operate to -200°C . These cryogenic breaks are intended to be TIG welded into cryogenic fluid transmission lines, and typical adapter designs are available with 1/8" to 3/8" diameters.



Liquid Breaks

Coolant fluid lines often require an electrical break. Installation of liquid breaks into a transmission line for coolant fluid requires soldering or low temperature brazing (below 700°C). Standard adapters fit 1/4" to 1/2" diameter tubes.



Vacuum Breaks & Envelopes

Various transitions in vacuum systems require voltage isolation. Breaks and Envelopes are all suitable for ultra high vacuum environments. Both are constructed using a high purity alumina insulator sealed into stainless or kovar sleeve adapters.

Vacuum Breaks are available with nominal tube diameters up to 3 inches, and voltage ratings up to 60,000 Volts DC. Standard designs include Weldable, Conflat Flange and Quick Flange adapters.

Vacuum Envelopes are available with nominal tube diameters up to 8 inches, and voltage ratings up to 20,000 Volts DC. Weldable and Conflat Flange adapters are standard.



Breaks

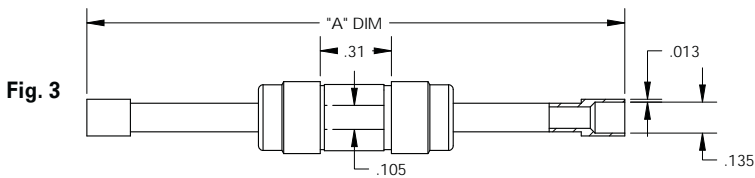
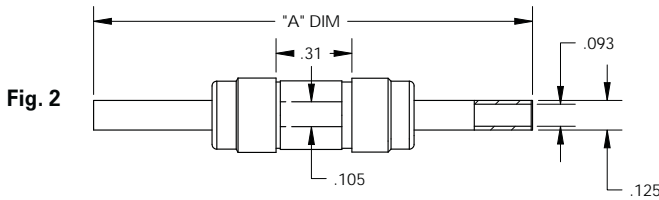
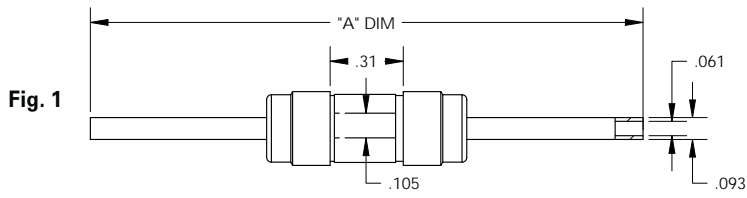
Section 6: Contents

Section	Type	Electrical Rating	Thermal Rating	Pages
6.1	Cryogenic Breaks Nominal Tube Diameter: 1/8 to 3/8 inches	Voltage: 5000 to 10,000 Volts DC	Break: -200 to 450°C	180-181
6.2	Liquid Breaks Nominal Tube Diameter: 1/4 to 1/2 inches	Voltage: 5000 Volts DC	Break: 0 to 250°C	182
6.3	Vacuum Breaks Nominal Tube Diameter: 3/4 to 3 inches	Voltage: 5000 to 60,000 Volts DC	Break: -200 to 450°C	183-184
6.4	Vacuum Envelopes Nominal Tube Diameter: 2-1/2 to 8 inches	Voltage: 10,000 to 20,000 Volts DC	Envelope: -200 to 450°C	185

Operating Conditions

The electrical and thermal ratings specified are safe operating limits determined by various factors including material properties, mechanical design, and the intended operating environment. All electrical ratings are based on operation with one side in dry atmosphere and the other side in vacuum of 1×10^{-4} Torr maximum pressure. Temperature ratings for various mounting options may reduce the operating range of an assembly. All assemblies have a maximum thermal gradient of 25°C per minute and may be damaged if this limit is exceeded.

1/8" Cryogenic Breaks 5000 Volts DC



NOM.	FIG	"A" DIM	PART #
3/32	1	2.30	A0574-2-W
1/8	2	1.80	A1886-1-W
1/8	2	2.30	A1886-2-W
1/8	2	1.84	A0578-1-W
1/8	3	2.34	A0578-2-W

1/4" & 3/8" Cryogenic Breaks 10,000 Volts DC



Fig. 1

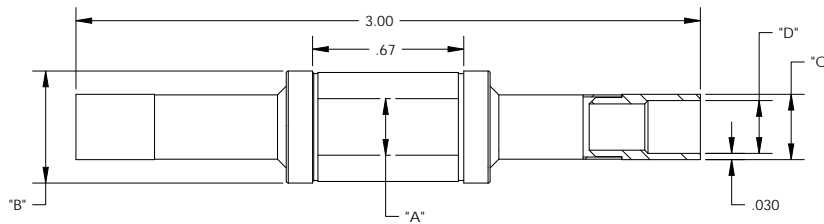
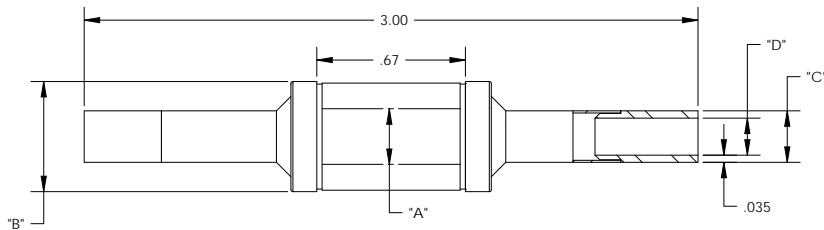
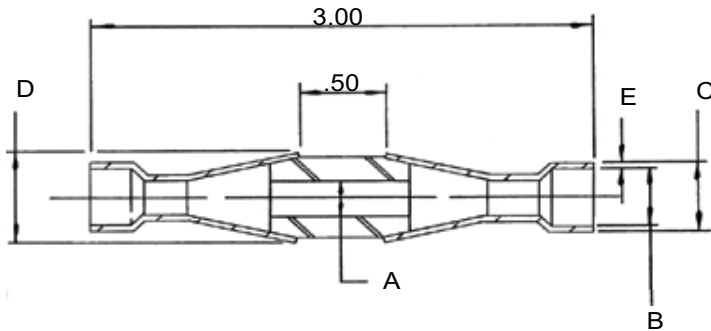


Fig. 2



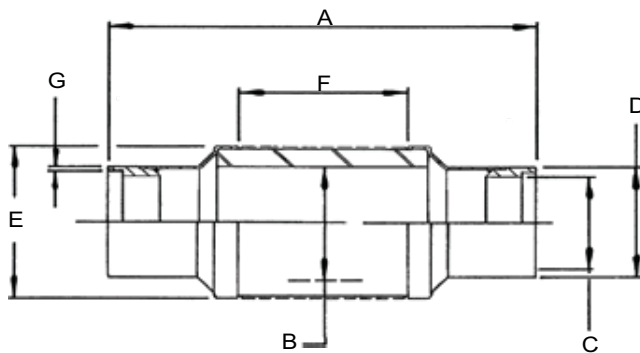
NOM.	FIG	A	B	C	D	PART #
1/4	1	.27	.54	.31	.25	A0573-1-W
1/4	2	.27	.54	.25	.18	A0572-1-W
3/8	1	.43	.79	.44	.38	A0573-2-W
3/8	2	.43	.79	.38	.31	A0572-2-W

1/4", 3/8", & 1/2" Liquid Breaks 5000 Volts DC



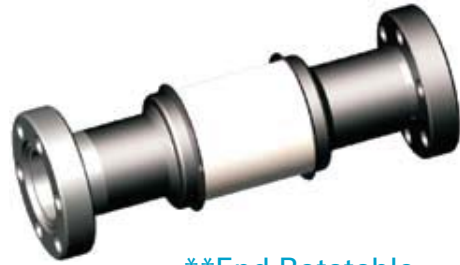
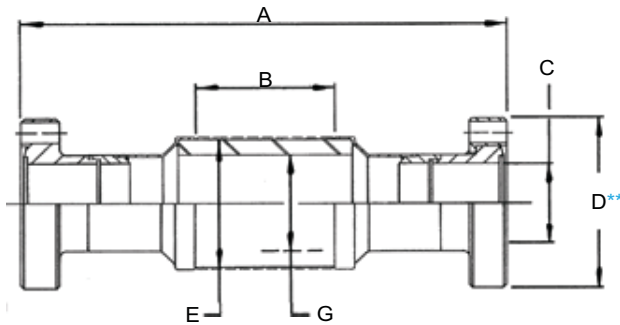
NOM.	MATERIAL	A	B	C	D	E	PART #
1/4	COPPER	.21	.255	.32	.59	.035	A0579-2-W
3/8	COPPER	.25	.380	.44	.59	.035	A0579-1-W
1/2	COPPER	.41	.505	.59	.74	.040	A0580-1-W

3/4" to 1-1/2" Vacuum Breaks to 60,000 Volts DC



NOM.	VOLTS	A	B	C	D	E	F	G	PART #
3/4	5KV	1.90	.75	.63	.75	1.00	.30	.035	A5266-1-W
3/4	15KV	2.60	.75	.63	.75	1.00	1.00	.035	A0584-1-W
3/4	30KV	4.60	.75	.63	.75	1.00	2.00	.035	A1743-1-W
1-1/2	5KV	2.20	1.25	1.37	1.50	1.66	.25	.065	A0594-1-W
1-1/2	30KV	3.80	1.25	1.37	1.50	1.66	2.00	.065	A0594-2-W
1-1/2	60KV	5.90	1.25	1.37	1.50	1.66	4.00	.065	A0594-3-W

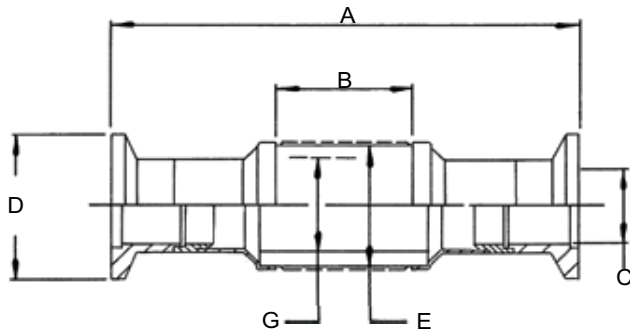
3/4" to 1-1/2" Vacuum Breaks to 60,000 Volts DC
CONFLAT FLANGE



**End Rotatable

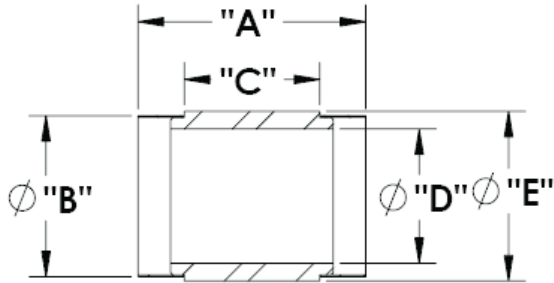
NOM.	VOLTS	A	B	C	D	E	G	PART #
3/4	5KV	2.90	.30	.63	1.33	1.00	.75	A7535-1-CF
3/4	15KV	3.62	1.00	.63	1.33	1.00	.75	A0585-1-CF
3/4	30KV	4.60	2.00	.63	1.33	1.00	.75	A2596-1-CF
1-1/2	5KV	2.65	.25	1.37	2.75	1.66	1.25	A0595-1-CF
1-1/2	30KV	4.20	2.00	1.37	2.75	1.66	1.25	A0595-2-CF
1-1/2	60KV	6.30	4.00	1.37	2.75	1.66	1.25	A0595-3-CF

3/4" to 1-1/2" Vacuum Breaks to 60,000 Volts DC
QUICK FLANGE



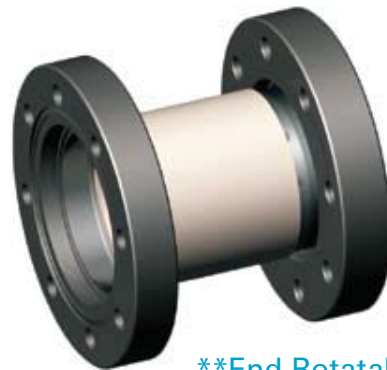
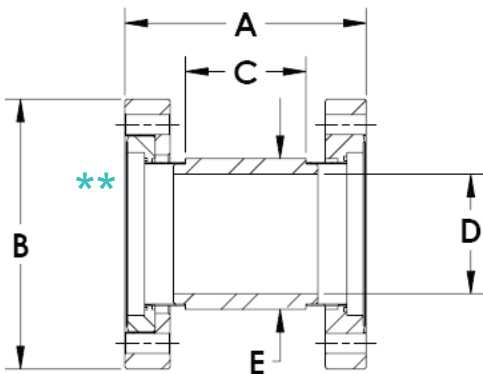
NOM.	VOLTS	A	B	C	D	E	G	PART #
3/4	5KV	2.90	.30	.63	1.18	1.00	.75	A7823-1-QF
3/4	15KV	3.62	1.00	.63	1.18	1.00	.75	A0592-1-QF
3/4	30KV	4.60	2.00	.63	1.18	1.00	.75	A1744-1-QF
1-1/2	5KV	2.50	.25	1.37	2.16	1.66	1.25	A0597-1-QF
1-1/2	30KV	4.10	2.00	1.37	2.16	1.66	1.25	A0597-2-QF
1-1/2	60KV	6.20	4.00	1.37	2.16	1.66	1.25	A0597-5-QF

1/2" to 3" Vacuum Breaks to 40,000 Volts DC



NOM.	VOLTS	A	B	C	D	E	PART #
1/2	10KV	1.55	.508	.75	.31	.65	A1988-1-W
1-1/2	20KV	2.58	1.20	1.50	.90	1.40	A1988-2-W
2-1/2	30KV	3.36	2.375	2.00	2.00	2.50	A1988-3-W
3	40KV	4.36	2.80	3.00	2.40	3.00	A1988-4-W

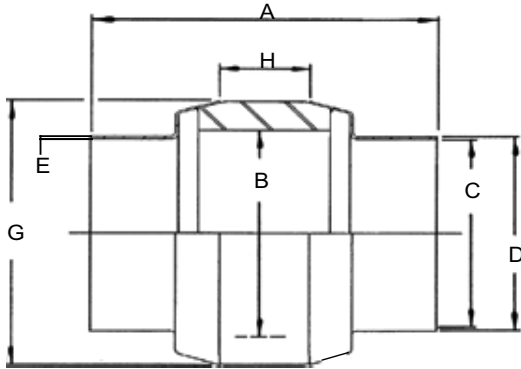
1/2" to 3" Vacuum Breaks to 40,000 Volts DC CONFLAT FLANGE



**End Rotatable

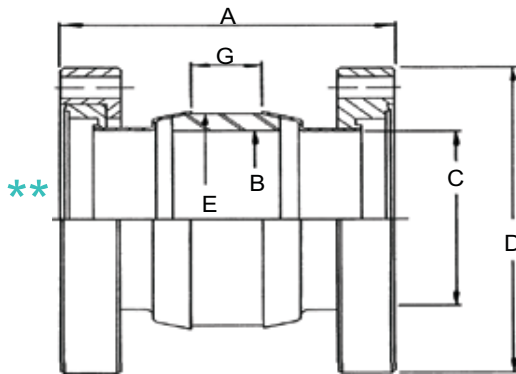
NOM.	VOLTS	A	B	C	D	E	PART #
1/2	10KV	1.84	1.33	.75	.31	.65	A1991-1-CF
1-1/2	20KV	3.00	2.75	1.50	.90	1.40	A1991-2-CF
2-1/2	30KV	4.00	4.50	2.00	2.00	2.50	A1991-3-CF
3	40KV	4.80	6.00	3.00	2.40	3.00	A1991-4-CF

2-1/2" to 8" Vacuum Envelopes to 20,000 Volts DC



NOM.	VOLTS	A	B	C	D	E	G	H	PART #
2-1/2	10KV	3.63	2.50	2.31	2.37	.03	3.23	.75	A0625-1-W
4	10KV	3.57	3.50	3.75	3.81	.03	4.25	.75	A0625-2-W
6	20KV	4.50	6.00	6.00	6.08	.04	6.92	1.50	A0625-3-W
8	20KV	4.64	7.75	7.75	7.83	.04	8.80	1.50	A0625-4-W

**2-1/2" to 8" Vacuum Envelopes to 20,000 Volts DC
CONFLAT FLANGE**



**End Rotatable

NOM.	VOLTS	A	B	C	D	E	G	PART #
2-1/2	10KV	4.50	2.50	2.31	4.00	3.23	.75	A0805-1-CF
4	10KV	4.62	3.50	3.75	6.00	4.25	.75	A0805-2-CF
6	20KV	5.50	6.00	6.00	8.00	6.92	1.50	A0805-3-CF
8	20KV	5.75	7.75	7.75	10.00	8.80	1.50	A0805-4-CF

ACCESSORIES

Section 7: Contents

Section	Item	Pages
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7.2	Vacuum Connectors & Cable Assemblies Sub Type C & D BNC SMA MHV SHV	191-196
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Thermocouple Connectors

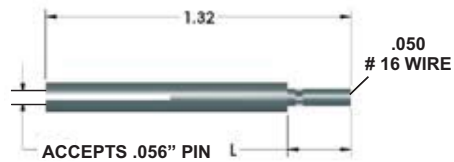
Miniature *Air Service to 125°C*



TYPE	PART #
C	A0381-4-CN
E	A0381-6-CN
J	A0381-5-CN
K	A0381-1-CN
N	A0381-7-CN

Crimp and Push Connectors

350°C Vacuum and Air Service



MATERIAL	L	QTY	PART #
Chromel	.275	Pack of 5	A1041-1-CN
Alumel	.275	Pack of 5	A1041-2-CN
Iron	.300	Pack of 5	A1041-3-CN
Constantan-J	.300	Pack of 5	A1041-4-CN
Constantan-E-T	.325	Pack of 5	A1041-5-CN
Nickel	.325	Pack of 5	A1041-6-CN



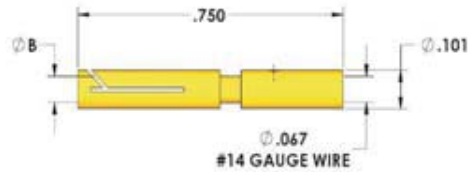
Screw & Nut Connectors

350°C Vacuum and Air Service

THREAD SIZE	QTY	PART #
3-48	Pack of 10	A1526-1-CN

Power – Crimp Type Contacts

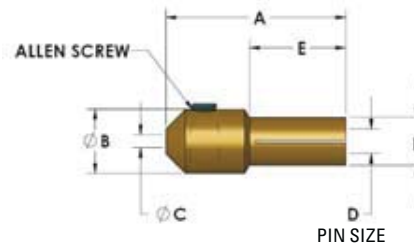
Operating Temperature -269°C to 200°C



MATERIAL	QTY	B	PART #
BeCu	Pack of 10	.050	A2965-1-CN
BeCu	Pack of 10	.056	A2965-3-CN
BeCu	Pack of 10	.062	A2965-2-CN

Power – Push-on Connectors

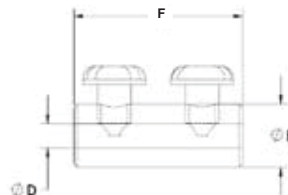
150°C Air / 200°C Vacuum



MATERIAL	A	B	C	D	E	F	QTY	PART #
BeCu	.69	.25	.050	.050	.38	.19	Pack of 10	A0721-2-CN
BeCu	.69	.25	.050	.060	.38	.19	Pack of 10	A0721-4-CN
BeCu	.69	.25	.050	.094	.38	.19	Pack of 10	A0721-1-CN
BeCu	.69	.25	.050	.040	.38	.19	Pack of 10	A0721-3-CN
BeCu	1.00	.50	.096	.250	.50	.45	Pack of 2	A1969-1-CN

Power – In-line Connectors

150°C Air / 400°C Vacuum



MATERIAL	D	E	F	QTY	PART #
BeCu	.059	.187	.500	Pack of 10	A0725-1-CN
BeCu	.067	.187	.500	Pack of 10	A0725-3-CN
BeCu	.120	.250	.560	Pack of 10	A0725-2-CN
BeCu	.134	.250	.630	Pack of 10	A0725-4-CN
BeCu	.161	.350	.560	Pack of 10	A0725-7-CN
BeCu	.260	.500	1.00	Pack of 10	A0725-6-CN

MS Circular Connectors
Voltage Rating 700 Volts Peak
Current Rating 10 Amps/pin
Accepts 0.056 or 0.062 Diameter Pins



MAXIMUM CURRENT*	PART #	TEMPERATURE
4 Pin - 28 Amps	A0125-1-CN	125° C
6 Pin - 36 Amps	A0126-1-CN	125° C
10 Pin - 50 Amps	A0127-1-CN	125° C
20 Pin - 75 Amps	A0128-1-CN	125° C
35 Pin - 100 Amps	A0740-1-CN	125° C
4 Pin - 28 Amps	A1070-2-CN	350° C
6 Pin - 36 Amps	A1136-3-CN	350° C
10 Pin - 50 Amps	A1070-1-CN	350° C
20 Pin - 75 Amps	A1181-1-CN	350° C
35 Pin - 100 Amps	A1388-1-CN	350° C

*all pins loaded

Power — High Voltage Silicon Cable

Operating Temperature -55°C to 125°C



5KV



10KV / 20KV

MATERIAL	COND. DIAM	AMPS	CABLE LENGTH	PART #
5KV	.094	25	96"	A2459-1-CN
10KV / 20KV	.094	25	96"	A2459-2-CN

Coaxial Connectors



COAXIAL TYPE	CABLE USED	PART #
BNC	RG58B/U	A0060-2-CN
MHV	RG59B/U	A0060-1CN
SHV-5	RG59B/U	A0154-1-CN
SHV-10	RG58, 58A, 58 C/U	A1498-1-CN
TYPE-N	RG214/U	A0675-1-CN
SMA	RG58B/U	A0667-1-CN
SHV-B	RG59B/U	A0843-1-CN
SHV-20	RG213/U	A0700-1-CN
MICRODOT CABLE (10ft)	RG178B/U	A1645-1-CN

Sub Type C & D Connectors & Contacts

Vacuum-side Connectors

Connectors do not include contacts



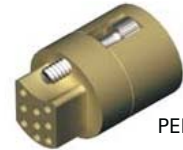
FEMALE PINS

PINS	PART #
9	A2375-1-CN
15	A1881-1-CN
25	A2378-1-CN
50	A2380-1-CN



MALE PINS

PINS	PART #
9	A2374-1-CN
15	A2376-1-CN
25	A2377-1-CN
50	A2379-1-CN



PEEK®

FEMALE PINS

PINS	PART #
9	A3030-1-CN

Air-side Connectors

Connectors do not include contacts



FEMALE PINS

PINS	PART #
9	A2711-4-CN
15	A2711-3-CN
25	A2711-2-CN
50	A2711-1-CN



DELRIN®

FEMALE PINS

PINS	PART #
9	A3034-1-CN

Contacts



QTY	PART #
Pack of 10 (FEMALE)	A2386-1-CN
Pack of 10 (MALE)	A2385-1-CN

Crimping Tool

Works for Male & Female Contacts



QTY	PART #
1 each	A4109-1-CT

Sub C & D Type, UHV Connectors & Wires

Please call for custom cable length and/or assembly.

Contact to Cable FEMALE PINS



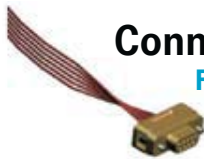
PINS	LENGTH	PART #
9	19"	A2356-1-WR
9	39"	A2357-1-WR
15	19"	A2360-1-WR
15	39"	A2361-1-WR
25	19"	A2364-1-WR
25	39"	A2365-1-WR
50	19"	A2368-1-WR
50	39"	A2369-1-WR

Contact to Cable MALE PINS



PINS	LENGTH	PART #
9	19"	A2354-1-WR
9	39"	A2355-1-WR
15	19"	A2358-1-WR
15	39"	A2359-1-WR
25	19"	A2362-1-WR
25	39"	A2363-1-WR
50	19"	A2366-1-WR
50	39"	A2367-1-WR

Connector to Cable FEMALE PINS



PINS	LENGTH	PART #
9	19"	A2340-1-CN
9	39"	A2341-1-CN
15	19"	A2344-1-CN
15	39"	A2345-1-CN
25	19"	A2348-1-CN
25	39"	A2349-1-CN
50	19"	A2352-1-CN
50	39"	A2353-1-CN

Ribbon Cable



PINS	LENGTH	PART #
9	19"	A2402-1-WR
9	39"	A2402-2-WR
9	96"	A2402-3-WR
15	19"	A2403-1-WR
15	39"	A2403-2-WR
15	96"	A2403-3-WR
25	19"	A2404-1-WR
25	39"	A2404-2-WR
25	96"	A2404-3-WR

Connector to Connector FEMALE PINS



PINS	LENGTH	PART #
9	19"	A2370-1-CN
15	19"	A2371-1-CN
25	19"	A2372-1-CN
50	19"	A2373-1-CN

Connector to Cable FEMALE PINS



PINS	LENGTH	PART #
9 - Male	19"	A2418-1-CN
9 - Male	39"	A2419-1-CN
9 - Female	19"	A2420-1-CN
9 - Female	39"	A2421-1-CN

Coaxial – BNC, UHV Cable Assemblies

The cables in the assemblies listed below consist of 26AWG, 50-Ohm coaxial cable. These components are UHV compatible to 1×10^{-10} Torr. See pg. 198 for cable details, part # A2236-5-WR.



Grounded Shield UHV Connector



Floating Shield UHV Connector



User End Female



SMA Male



BNC Male



BNC to BNC UHV Cable

CONNECTOR TYPE	FIG	LENGTH	PART #
----------------	-----	--------	--------

Connector to Cable

Connector to Cable UHV cable assemblies are fitted with stainless steel or BNC Male connectors at one end and a non-terminated, Kapton® insulated wire at the other.

Grounded	1	19"	A7301-1-CN
Grounded	1	39"	A7302-1-CN
Floating	2	19"	A7303-1-CN
Floating	2	39"	A7304-1-CN
BNC	---	19"	A7305-1-CN
BNC	---	39"	A7306-1-CN

Connector to Connector

Connector to Connector UHV cable assemblies are fitted with stainless steel BNC Male connectors at one end and a user-specified connector at the other: User-End Female, SMA Male, or BNC Male. These connectors mate directly to the vacuum side of corresponding single-ended feedthroughs.

User-End Female	3	-2
SMA Male	---	-5
BNC Male	---	-3

To add a connector, change the dash number at the end of the part number from -1 to the corresponding number of your desired connector; then add the price of the connector to the price of the cable assembly. For example, a 39" BNC cable assembly with a BNC Male connector would be part number A7306-3-CN and would cost \$170.00.

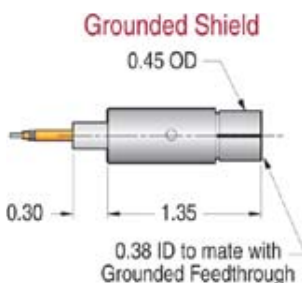


Fig. 1

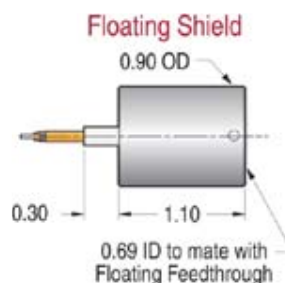


Fig. 2

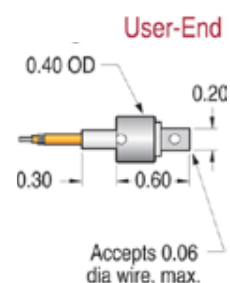
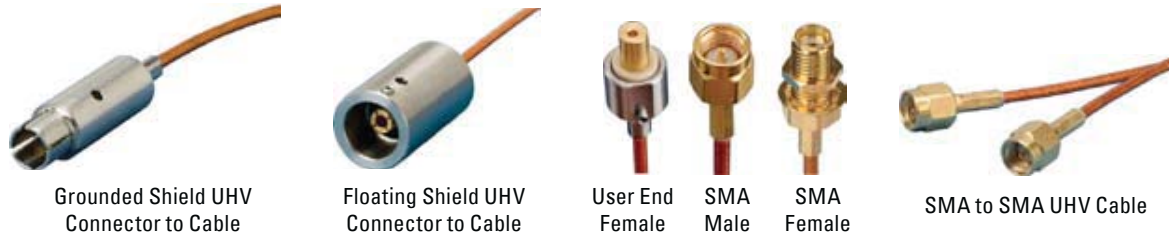


Fig. 3

Coaxial — SMA, UHV Cable Assemblies

The cables in the assemblies listed below consist of 26AWG, 50-Ohm coaxial cable. These components are UHV compatible to 1×10^{-10} Torr. See pg. 198 for cable details, part # A2236-5-WR.



CONNECTOR TYPE	FIG	LENGTH	PART #
----------------	-----	--------	--------

Connector to Cable

Connector to Cable UHV cable assemblies are fitted with stainless steel Female or SMA Male connectors at one end and a non-terminated, Kapton® insulated wire at the other.

Grounded	1	19"	A7307-1-CN
Grounded	1	39"	A7308-1-CN
Floating	2	19"	A7309-1-CN
Floating	2	39"	A7310-1-CN
SMA	---	19"	A7311-1-CN
SMA	---	39"	A7312-1-CN

Connector to Connector

Connector to Connector UHV cable assemblies are fitted with stainless steel Female or SMA Male connectors at one end and a user-specified connector at the other: User-End Female, SMA Male, or SMA Female.

These connectors mate directly to the vacuum side of corresponding single-ended feedthroughs.

User-End Female	3		-2
SMA Male	---		-5
SMA Female	---		-6

To add a connector, change the dash number at the end of the part number from -1 to the corresponding number of your desired connector; then add the price of the connector to the price of the cable assembly. For example, a 39" SMA cable assembly with an SMA Male connector would be part number A7312-5-CN and would cost \$170.00.

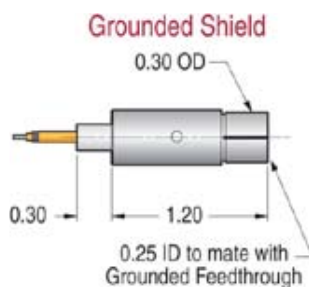


Fig. 1

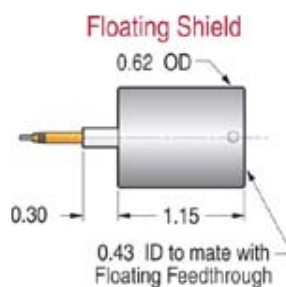


Fig. 2

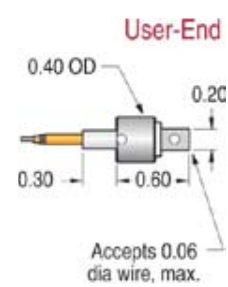


Fig. 3

Coaxial – MHV, UHV Cable Assemblies

The cables in the assemblies listed below consist of 26AWG, 50-Ohm coaxial cable. These components are UHV compatible to 1×10^{-10} Torr. See pg. 198 for cable details, part # A2236-5-WR.

CABLE IS RATED TO 2KVDC



MHV Grounded Shield UHV Connector



MHV Floating Shield UHV Connector



User End Female



MHV Male



MHV to MHV UHV Cable

CONNECTOR TYPE	FIG	LENGTH	PART #
----------------	-----	--------	--------

Connector to Cable

Connector to Cable UHV cable assemblies are fitted with either stainless steel Female or MHV Male connectors at one end and a non-terminated, Kapton® insulated wire at the other

Grounded	1	19"	A7313-1-CN
Grounded	1	39"	A7314-1-CN
Floating	2	19"	A7315-1-CN
Floating	2	39"	A7316-1-CN
MHV	---	19"	A7317-1-CN
MHV	---	39"	A7318-1-CN

Connector to Connector

Connector to Connector UHV cable assemblies are fitted with either stainless steel Female or MHV Male connectors at one end and a user-specified connector at the other: User-End Female or MHV Male. These connectors mate directly to the vacuum side of corresponding single-ended feedthroughs.

User-End Female	---	-2
MHV Male	---	-4

To add a connector, change the dash number at the end of the part number from -1 to the corresponding number of your desired connector; then add the price of the connector to the price of the cable assembly. For example, a 39" MHV cable assembly with an MHV Male connector would be part number A7318-4-CN and would cost \$190.00.

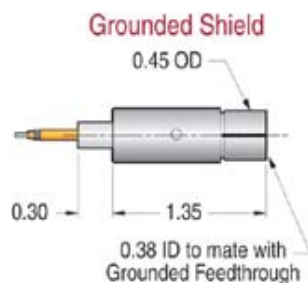


Fig. 1

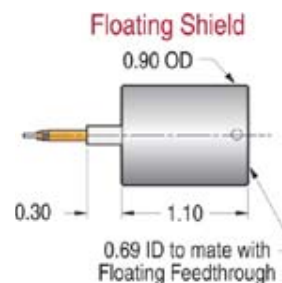


Fig. 2

Coaxial — SHV-5, UHV Cable Assemblies

The cables in the assemblies listed below consist of 26AWG, 50-Ohm coaxial cable. These components are UHV compatible to 1×10^{-10} Torr. See pg. 198 for cable details, part # A2236-5-WR.

CABLE IS RATED TO 2KVDC



SHV-5 Grounded Shield UHV Connector



SHV-5 Floating Shield UHV Connector



User End Female

CONNECTOR TYPE	FIG	LENGTH	PART #
----------------	-----	--------	--------

Connector to Cable

Connector to Cable UHV cable assemblies are fitted with stainless steel Female connector at one end and a non-terminated, Kapton® insulated wire at the other.

Grounded	1	19"	A7319-1-CN
Grounded	1	39"	A7320-1-CN
Floating	2	19"	A7321-1-CN
Floating	2	39"	A7322-1-CN
SHV-5	---	19"	A7323-1-CN
SHV-5	---	39"	A7324-1-CN

Connector to Connector

Connector to Connector UHV cable assemblies are fitted with stainless steel Female connectors at one end and a user-specified connector at the other.

These connectors mate directly to the vacuum side of corresponding single-ended feedthroughs.

User-End Female	3	-2
-----------------	---	----

To add a connector, change the dash number at the end of the part number from -1 to the corresponding number of your desired connector; then add the price of the connector to the price of the cable assembly. For example, a 39" SHV-5 Floating cable assembly with a User-End Female connector would be part number A7322-2-CN and would cost \$320.00.

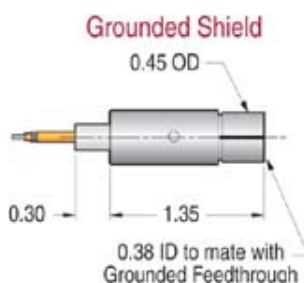


Fig. 1

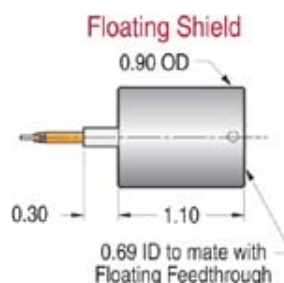


Fig. 2

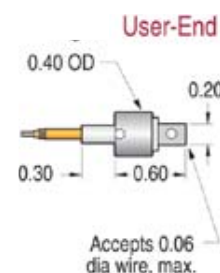


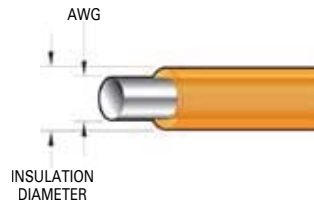
Fig. 3

Kapton Insulated Wire

Features and Specifications

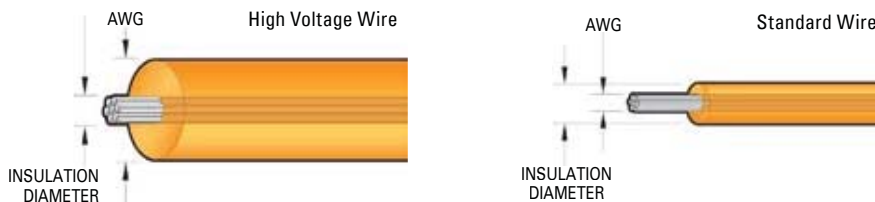
UHV, Ultrahigh Vacuum..... 1×10^{-10} Torr
 Temperature Range..... -75° to 250°C
 Dielectric Constant..... 2.9
 Dielectric Strength 80kV / mm
 Dissipation Factor, 1MHz..... 0.002
 Moisture Absorption 0.4% @ 50% RH
 Radiation Resistance..... 109 Rads

Solid Wire



WIRE AWG	WIRE LENGTH	WIRE DIAMETER	INSULATION DIAMETER	VOLTAGE RATING	CURRENT RATING	MIN. BEND RADIUS	PART #
30	30'	0.010	0.020	600VAC / 2kVDC	1.50 A	0.30	A2236-1-WR
26	30'	0.016	0.025	600VAC / 2kVDC	3.00 A	0.31	A7300-2-WR
22	30'	0.024	0.034	600VAC / 2kVDC	5.50 A	0.32	A2236-2-WR

Stranded Wire



WIRE AWG	WIRE LENGTH	# OF STRANDS X DIAMETER	INSULATION DIAMETER	VOLTAGE RATING	CURRENT RATING	MIN. BEND RADIUS	PART #
28	30'	7 x 0.005	0.020	600VAC / 2kVDC	2 A	0.25	A7300-3-WR
26	30'	7 x 0.006	0.025	600VAC / 2kVDC	3 A	0.25	A7300-4-WR
24	30'	7 x 0.008	0.030	600VAC / 2kVDC	4 A	0.55	A7300-5-WR

High Voltage

26	15'	7 x 0.006	0.062	3kVAC / 10kVDC	3 A	1.10	A7325-1-WR
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Coaxial Wire

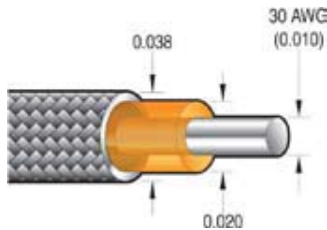


Fig. 1

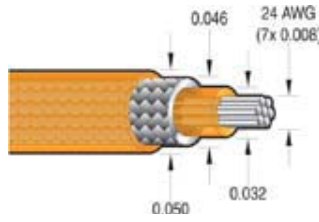


Fig. 2

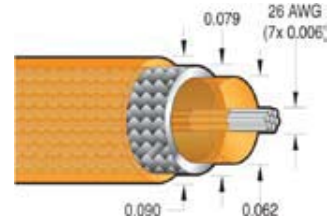


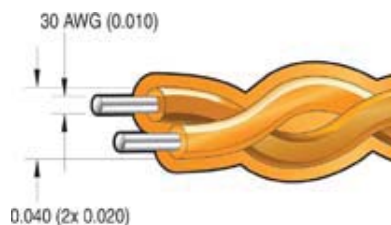
Fig. 3

FIG	CABLE LENGTH	WIRE DIAMETER	RESISTANCE	VOLTAGE RATING	CURRENT RATING	MIN. BEND RADIUS	PART #
<u>30 AWG COAXIAL CABLE, Solid Core</u>							
1	30'	0.010	377 Ω /km at 20°C max	600VAC / 2kVDC	1.5 A	0.45	A2236-3-WR
<u>24 AWG COAXIAL CABLE, Multi-strand Core</u>							
2	15'	7 x 0.008	88.3 Ω /km at 20°C max	600VAC / 2kVDC	4.5 A	1.00	A7326-1-WR
2	30'	7 x 0.008	88.3 Ω /km at 20°C max	600VAC / 2kVDC	4.5 A	1.00	A2236-4-WR

50 Ohm Coaxial Cable

<u>30 AWG COAXIAL CABLE, Multi-strand Core</u>							
3	15'	7 x 0.004	353 Ω /km at 20°C max	600VAC / 2kVDC	1.5 A	0.45	A7326-2-WR
<u>26 AWG COAXIAL CABLE, Multi-strand Core</u>							
3	15'	7 x 0.006	159 Ω /km at 20°C max	600VAC / 2kVDC	3.0 A	1.05	A2236-5-WR

Thermocouple Wire, Type-K

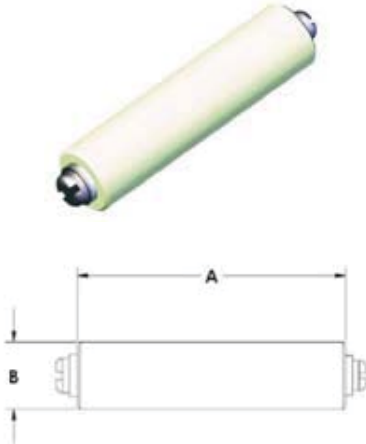


Thermocouple Wire pairs consist of non-welded positive Chromel® and negative Alumel® legs. Kapton® is applied with a resin process to eliminate air pockets normally associated with Kapton® tape insulated thermocouple wire from other suppliers.
UHV rated to 1×10^{-10}
Operating Temperature 250° C

TYPE	WIRE AWG	WIRE LENGTH	WIRE DIAMETER	INSULATION DIAMETER	MIN. BEND RADIUS	PART #
K	30	19"	2 x 0.010	0.020	0.55	A2331-1-WR
K	30	39"	2 x 0.010	0.020	0.55	A2332-1-WR
K	30	96"	2 x 0.010	0.020	0.55	A2333-1-WR

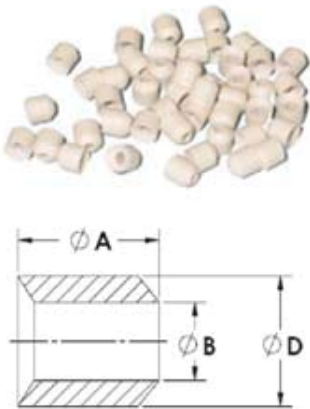
To add welded thermocouple junction to wire ends, change -1 to -2 and add \$15 to the price.

Ceramic Standoff, Steatite, Female



DC (KV) AIR	DC (KV) VACUUM	THREAD SIZE	A	B	PART #
3	7	6/32	.38	.38	A1625-1-C
4	10	6/32	.50	.38	A1625-2-C
5	12	8/32	.63	.50	A1625-5-C
6	15	8/32	.75	.38	A1625-4-C
8	20	6/32	1.00	.38	A1625-3-C
8	20	8/32	1.00	.50	A1625-6-C
8	20	10/32	1.00	.75	A1625-8-C
10	25	1/4-20	1.25	1.00	A1625-10-C
14	35	8/32	2.00	.50	A1625-7-C
14	35	10/32	2.00	.75	A1625-9-C
16	40	1/4-20	2.5	1.00	A1625-11-C

Ceramic Beads, Alumina



A	D	B	ACCEPTS WIRE	PART #
.110	.100	.053	.045	A1429-1-C
.185	.183	.087	.064	A1429-2-C
.170	.156	.068	.050	A1429-3-C
.260	.239	.107	.102	A1429-4-C
.260	.240	.144	.128	A1429-5-C
.400	.366	.146	.128	A1429-6-C

Ceramic Spacers, Alumina



PINS	DIAMETER	THICKNESS	ACCEPTS WIRE	PART #
4 & 10	.62	.135	.070	A0175-1-C
6	.62	.135	.070	A0175-2-C
20	1.25	.125	.070	A0207-1-C
35	1.25	.125	.070	A0735-1-C