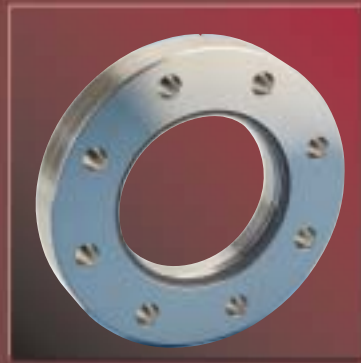
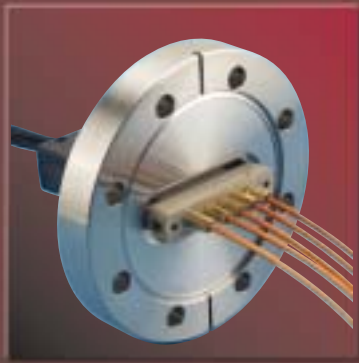


Vacuum Feedthroughs, Inside and Out



Accu-Glass Products Inc.

Accu-Glass Products Solutions

As a leading manufacturer and supplier of high and ultrahigh vacuum electrical feedthroughs, Accu-Glass Products is committed to providing the scientific and industrial vacuum community with complete solutions for electrical wiring. Solutions that allow fast and easy product integration. Solutions that cover all aspects of wiring and vacuum interfaces.

The manufacturing of ultrahigh vacuum hermetic electrical feedthroughs is a highly specialized technology possessed by numerous companies around the world, but how to interface with these electrical feedthroughs is often ignored by most. Scientists, engineers and technicians are often left to resolve a products' connection deficiencies on their own. In fact, most feedthrough manufacturers believe their involvement ends where the vacuum vessel begins.

Years of listening to our customers' concerns and needs has helped shape our product design philosophy. This philosophy is evident in our commitment to vacuum users around the world by providing them with solutions that go beyond the air-to-vacuum interface.

We understand that vacuum professionals are primarily concerned with their application and its successful operation — feedthrough reliability, performance and integration are the

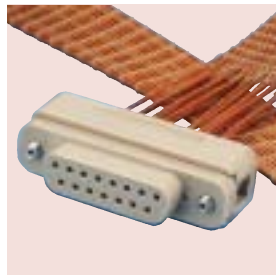
manufacturer's responsibility. In other words, we take on the task of designing, engineering and manufacturing vacuum components that meet or exceed an application's requirements and completely address the issues of air and vacuum wiring so our customers don't have to.

The products presented in this catalog are the result of our clear understanding of the industry's demand for end-to-end air-to-vacuum wiring solutions. All electrical feedthrough products have been designed and manufactured with both air and vacuum compatible connectors and accessories. Some products are available as complete kits and others are available as optional accessories for maximum user flexibility.

Accu-Glass Products solutions extend beyond the products you see within these 32 pages. Please keep in mind that we are always prepared to discuss custom engineered solutions for those applications requiring something other than our standard product offering.

Accu-Glass Products technical sales engineers are ready to assist with your particular requirements. Please refer to the last page of this catalog for a complete list of Accu-Glass Products contact information.

Vacuum Feedthroughs . . . Inside and Out

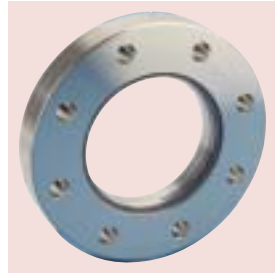
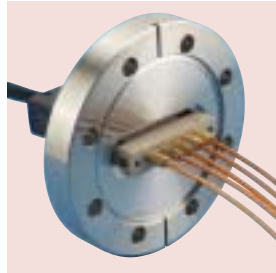


Multipin Feedthroughs

2

Thermocouple-Power Feedthroughs

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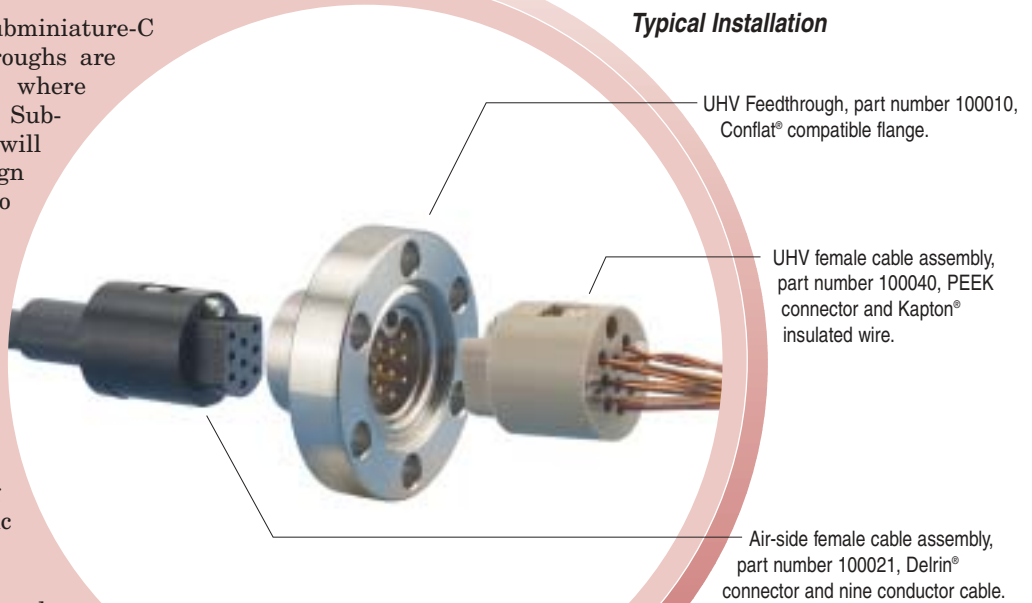
Product Highlights

- **Electrical Feedthroughs** — Includes multipin, coaxial, power and thermocouple hermetic glass-to-metal feedthroughs designed to meet standard Subminiature-D configurations, plus both air-side and UHV vacuum-side connectors and wires.
- **In-Vacuum Wiring** — Designed for environments with UHV pressures to 1×10^{-10} Torr and temperatures to 250°C.
- **Viewports** — Zero profile high transmission glass viewports available from 0.38 to 2.5 inch view diameters.
- **Motion Feedthroughs** — Precision linear and rotary feedthroughs with a welded bellows shaft seal. Linear feedthroughs are available with either 1 or 2 inch travel. Rotary feedthroughs provide continuous rotary motion.

Accu-Glass Products Subminiature-C multipin hermetic feedthroughs are designed for applications where space is limited or where Subminiature-D connections will not fit. The compact design allows installation into 1.33-inch CF metal seal and ISO-NW16KF elastomer seal flanges.

Nine gold plated pins are in a straight through pin-to-pin design and are hermetically sealed and electrically insulated in a stainless steel shell using the latest in glass-ceramic bonding technology.

Subminiature-C feedthroughs and cables are sold individually or as kits, where each kit contains a feedthrough and both vacuum and air side cable assemblies. Air and vacuum side connectors are fitted with captured stainless steel socket head screws that provide a means of securely locking them to their mating feedthroughs. On the vacuum side, Kapton® insulated cable assemblies fitted with PEEK connectors are available to meet the demands of ultrahigh vacuum environments. In-vacuum connector screws are vented where required and the feedthrough's screw-boss functions as a locating key. Air to vacuum pin position is identified with a permanent surface mark, which clearly locates pin assignments.



Typical Installation

Note: Unless ordered as a complete kit, cable assemblies are not included with feedthrough and must be purchased separately.

Features

- 9-Pin configuration
- High temperature rated to 250°C
- UHV compatible construction
- Conflat® compatible flange mounts
- ISO compatible flange mounts
- Kapton® insulated vacuum cables
- PEEK connector with locking screws
- Air side connectors available
- Custom versions on request

Specifications Notes

- 1 Electrical ratings are maximum test values. Feedthroughs are intended for instrumentation applications carrying low level signal voltages and currents.
- 2 PEEK is a polyetheretherketone thermoplastic.
- 3 Overall assembly ratings must be adjusted to that of the lowest rated component.
- 4 All dimensions are in inches unless specified otherwise.

Specifications

Voltage ¹	300VDC maximum
Current	5A maximum at 20°C
Material	
Shell	Stainless Steel
Pins	Ni-Fe alloy, gold plated
Seal and Insulation	Glass-Ceramic
Connector, Air	Delrin®
Connector, Vacuum ²	PEEK

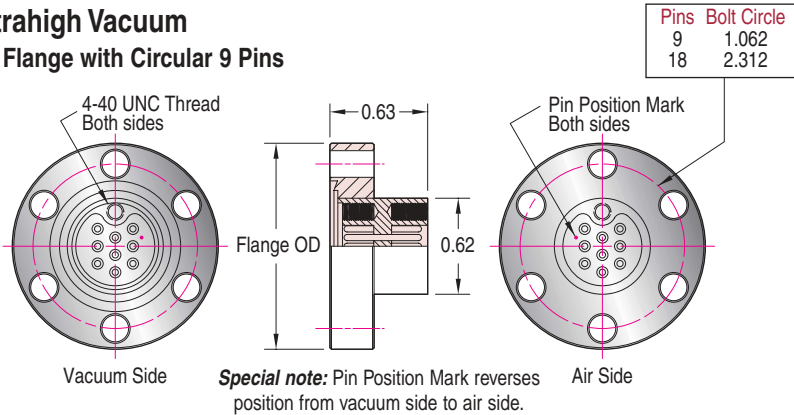
Vacuum Range

UHV, Ultrahigh vacuum	1x10 ⁻¹⁰ Torr
HV, High vacuum	1x10 ⁻⁸ Torr

Temperature Range³

Feedthrough	250°C
Flange, CF Style	450°C
Flange, KF / LF Style	150°C
Connector & cable, Air	80°C
Connector & cable, Vacuum	250°C
Thermal gradient	25°C / minute maximum

Ultrahigh Vacuum CF Flange with Circular 9 Pins



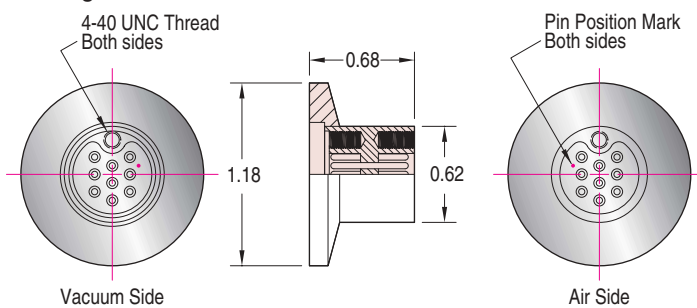
100000, UHV CF 9-Pin Complete Kit



100012 UHV CF 2x 9-Pin Feedthrough (Vacuum Side)

Number Contacts	Flange Size	Flange OD	Includes	Model Number	Part Number	Unit Price \$
Complete Kit						
9	133 CF	1.33	Feedthrough with cable assemblies • 96-inch air female cable assembly • 19-inch UHV female cable assembly	9C-KIT-133	100000	421
Feedthrough						
9	133 CF	1.33	Feedthrough without cable assemblies	9C-133	100010	255
18	275 CF	2.73	Feedthrough with two 9-pin connectors, 0.750-inch center-to-center, without cable assemblies	9C2-275	100012	495

High Vacuum ISO KF Flange with Circular 9 Pins



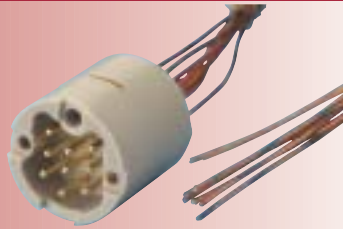
100001, HV ISO-KF 9-Pin Complete Kit



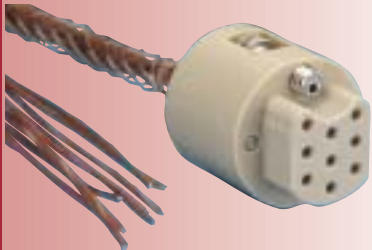
100011, HV ISO-KF 9-Pin Feedthrough (Vacuum Side)

Special note: Pin Position Mark reverses position from vacuum side to air side.

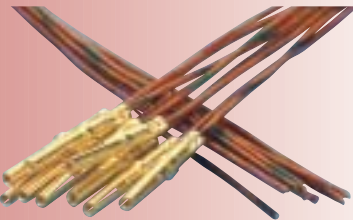
Number Contacts	Flange Size	Flange OD	Includes	Model Number	Part Number	Unit Price \$
Complete Kit						
9	NW16 KF	1.18	Feedthrough with cable assemblies • 96-inch air female cable assembly • 19-inch UHV female cable assembly	9C-KIT-K16	100001	421
Feedthrough						
9	NW16 KF	1.18	Feedthrough without cable assemblies	9C-K16	100011	255



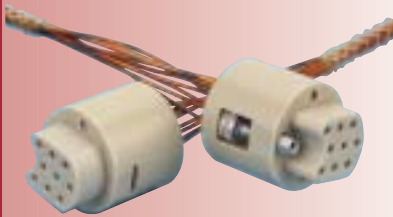
100030, Male Pin UHV Connector to Cable



100040, Female Socket UHV Connector to Cable



100060, Female Socket UHV Contact to Cable



100120, Female Socket UHV Connector to Connector Extension Cable



100020, Female Socket Air Connector to Cable

Ultrahigh Vacuum, Round Cable Assemblies

Connector to Cable UHV round cable assemblies are fitted with PEEK Subminiature-C female or male connectors at one end and nine, non-terminated, color coded Kapton® insulated wires at the other. The female cable connectors mate directly onto the vacuum-side of nine-pin Subminiature-C feedthroughs as shown on page 2, or with the male in-vacuum cable connectors. The cable jacket is a PEEK braid with a nominal diameter of 0.14 inches. The nine wires are 28 AWG silver plated copper conductors, stranded 7 x 0.005.

Contact to Cable UHV ribbon cable assemblies include male or female contacts on one end and nine, non-terminated, Kapton® insulated ribbon cable at the other. **Special note:** They do not include PEEK connectors and will not allow subsequent connector installation. Wires must be threaded through the connector back-piece before crimping contacts.

Contact to Wire UHV leads are non-bundled individual wire strands ideally suited for applications with complex wire routing requirements and allow subsequent connector installation.

Connector to Connector Extension Cables are fitted with PEEK Subminiature-C female connectors on both ends of a 19-inch UHV round cable.

Number Contacts	Wires		Connector			Model Number	Part Number	Unit Price \$
	Length	Diameter	Type	OD	Length			

Connector to Cable

9	19	7 x 0.005	Male	0.60	0.50	CKAP-C9-19PC	100030	137
9	39	7 x 0.005	Male	0.60	0.50	CKAP-C9-39PC	100031	162
9	19	7 x 0.005	Female	0.60	0.75	CKAP-C9-19SC	100040	137
9	39	7 x 0.005	Female	0.60	0.75	CKAP-C9-39SC	100041	162

Contact to Cable ~ see Special note above

9	19	7 x 0.005	Male	-	-	CKAP-C9-19P	100050	42
9	39	7 x 0.005	Male	-	-	CKAP-C9-39P	100051	67
9	19	7 x 0.005	Female	-	-	CKAP-C9-19S	100060	42
9	39	7 x 0.005	Female	-	-	CKAP-C9-39S	100061	67

Contact to Wire

10	19	7 x 0.005	Male	-	-	KAP-K1-19P	100070	48
10	39	7 x 0.005	Male	-	-	KAP-K1-39P	100071	61
10	19	7 x 0.005	Female	-	-	KAP-K1-19S	100080	48
10	39	7 x 0.005	Female	-	-	KAP-K1-39S	100081	61

Connector to Connector Extension Cable

9	19	7 x 0.005	Female	0.60	0.75	CKAP-C9-192SC	100120	250
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Air-Side, Round Cable Assemblies

Connector to Cable air-side round cable assemblies are fitted with a Delrin® Subminiature-C female connector at one end and non-terminated nine PVC insulated wires on the other. The female cable connectors mate directly onto the air-side of nine-pin Subminiature-C feedthroughs as shown on page 2. The cable jacket is gray PVC with a nominal diameter of 0.23 inches. The nine wires are 24 AWG tinned-copper conductors, stranded 7 x 0.008. Shielding is aluminum / Mylar® foil with 24 AWG tinned-copper drain wire.

Number Contacts	Wires		Connector			Model Number	Part Number	Unit Price \$
	Length	Diameter	Type	OD	Length			

Connector to Cable

9	48	7 x 0.008	Female	0.60	0.87	AIR-CP9-48SC	100020	100
9	96	7 x 0.008	Female	0.60	0.87	AIR-CP9-96SC	100021	107

See page 2 for **Specifications**

Ultrahigh Vacuum, Ribbon Cable Assemblies

Connector to Cable UHV ribbon cable assemblies are fitted with PEEK Subminiature-C female or male connectors at one end and nine, non-terminated, Kapton® insulated ribbon cable at the other. The female cable connectors mate directly onto the vacuum-side of nine-pin Subminiature-C feedthroughs as shown on page 2, or with the male in-vacuum cable connectors. The ribbon cable jacket is a PEEK weave with a 0.04 x 0.40 inch nominal cross-section. The nine wires are 28 AWG silver plated copper conductors, stranded 7 x 0.005.

Contact to Cable UHV ribbon cable assemblies include male or female contacts on one end and nine, non-terminated, Kapton® insulated ribbon cable at the other. **Special note:** They do not include PEEK connectors and will not allow subsequent connector installation. Wires must be threaded through the connector back-piece before crimping contacts.

Connector to Connector Extension Cables are fitted with PEEK Subminiature-C female connectors on both ends of a 19-inch UHV ribbon cable.

Number Contacts	Wires		Connector			Model Number	Part Number	Unit Price \$
	Length	Diameter	Type	OD	Length			
Connector to Cable								
9	19	7 x 0.005	Male	0.60	0.50	CKAP-R9-19PC	100100	158
9	39	7 x 0.005	Male	0.60	0.50	CKAP-R9-39PC	100101	205
9	19	7 x 0.005	Female	0.60	0.75	CKAP-R9-19SC	100110	158
9	39	7 x 0.005	Female	0.60	0.75	CKAP-R9-39SC	100111	205

Contact to Cable ~ see Special note above

9	19	7 x 0.005	Male	-	-	KAP-R9-19P	100240	63
9	39	7 x 0.005	Male	-	-	KAP-R9-39P	100241	110
9	19	7 x 0.005	Female	-	-	KAP-R9-19S	100250	63
9	39	7 x 0.005	Female	-	-	KAP-R9-39S	100251	110

Connector to Connector Extension Cable

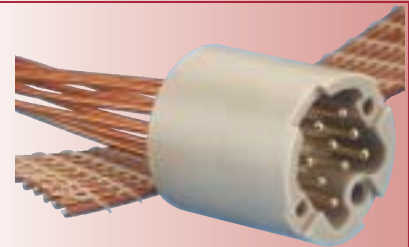
9	19	7 x 0.005	Female	0.60	0.75	CKAP-R9-192SC	100130	271
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Connectors, Contacts & Crimping Tools

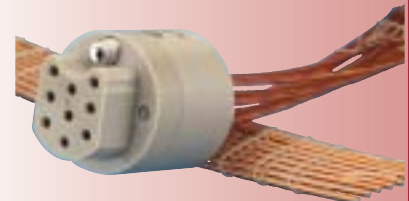
Components in this section are sold as the most basic components. Connectors do not include contacts and must be purchased separately.

Number Contacts	Connector					Use Contact No.	Model Number	Part Number	Unit Price \$	
	Side	Material	Type	OD	Length					
Connectors										
9	UHV	PEEK	Male	0.60	0.50	100170	9C-PKP	100140	95	
9	UHV	PEEK	Female	0.60	0.75	100180	9C-PKS	100150	95	
9	Air	Delrin®	Female	0.60	0.75	100180	9C-DS	100160	75	
Contacts										
1 Pack	UHV / Air		Male	0.04	—	10/pkg	GP-10	100170	20	
1 Pack	UHV / Air		Female	0.04	—	10/pkg	GS-10	100180	20	
Crimp Tool										
1 Unit	UHV / Air		Crimping tool for male and female contacts				DCT-1		100190	395

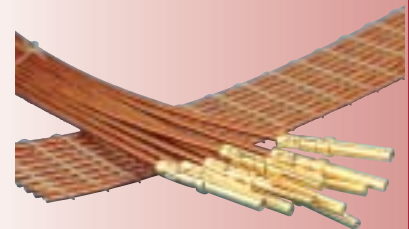
See page 2 for **Specifications**



100100, Male Pin UHV Connector to Cable



100110, Female Socket UHV Connector to Cable



100250, Female Socket UHV Contact to Cable



100150, Female Socket UHV Connector



100190, Contact Crimp Tool

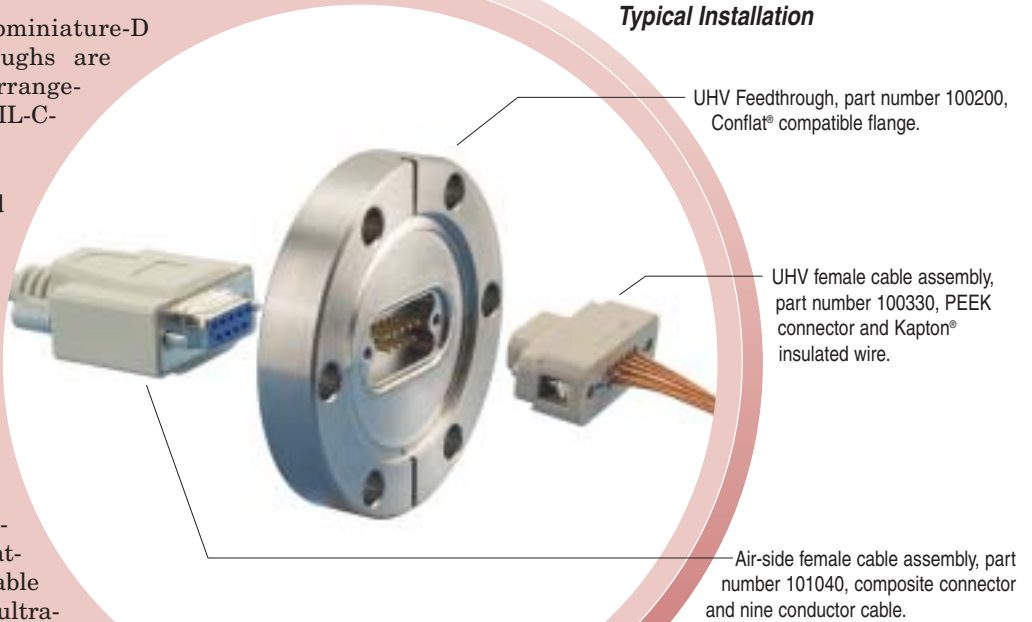
Multipin hermetic Subminiature-D instrumentation feedthroughs are constructed with pin arrangements designed to meet MIL-C-24308 specifications.

9, 15, 25 or 50 gold plated pins are in a straight through pin-to-pin design and are hermetically sealed and electrically insulated in a stainless steel shell using the latest in glass-ceramic bonding technology.

Ultrahigh vacuum cable assemblies with PEEK connectors and Kapton® insulated ribbon cables are available to meet the demands of ultrahigh vacuum environments.

Vacuum side cable assemblies, individual connectors and other accessories are listed on pages 8 and 9.

Subminiature-D multipin assemblies with up to 250 pin configurations are frequently fabricated. For unique requirements, flanges with over 1,000 pins have been engineered and fabricated.



Note: Connectors and cables are not included with feedthrough and must be purchased separately.

Features

- 9, 15, 25 & 50 pin configurations
- High temperature rated to 250°C
- UHV compatible construction
- Conflat® compatible flange mounts
- ISO compatible flange mounts
- Kapton® insulated vacuum cables
- PEEK connector with locking screws
- Air side connectors available

Specifications Notes

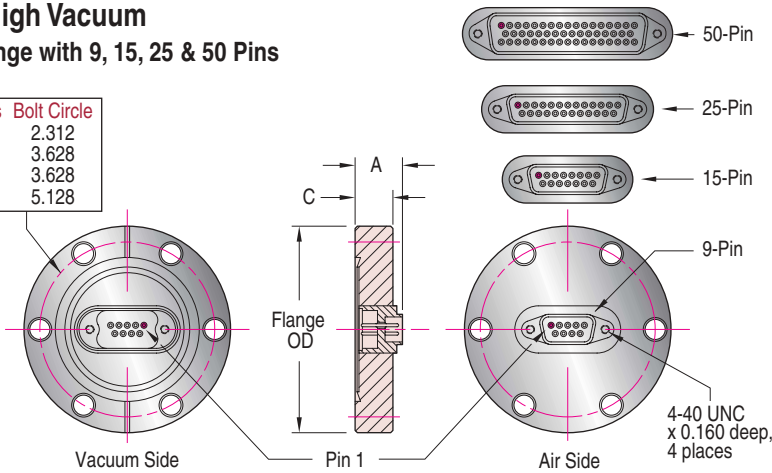
- 1 Electrical ratings are maximum test values. Feedthroughs are intended for instrumentation applications carrying low level signal voltages and currents.
- 2 PEEK is a polyetheretherketone thermoplastic.
- 3 Overall assembly ratings must be adjusted to that of the lowest rated component.
- 4 All dimensions are in inches unless specified otherwise.

Specifications

Voltage ¹	300VDC maximum	HV, High vacuum	1x10 ⁻⁸ Torr
Current	5A maximum at 20°C	Temperature Range ³	
Material		Feedthrough	250°C
Shell	Stainless Steel	Flange, CF Style	450°C
Pins	Ni-Fe alloy, gold plated	Flange, KF / LF Style	150°C
Seal and Insulation	Glass-Ceramic	Connector, Air	80°C
Connector, Air	Composite	Connector, Vacuum	250°C
Connector, Vacuum ²	PEEK	Thermal gradient	25°C / minute maximum
Vacuum Range			
UHV, Ultrahigh vacuum	1x10 ⁻¹⁰ Torr		

Ultrahigh Vacuum CF Flange with 9, 15, 25 & 50 Pins

Pins	Bolt Circle
9	2.312
15	3.628
25	3.628
50	5.128



Special note: Pin 1 reverses position from vacuum side to air side.

Number Contacts	CF Flange	Flange OD	A	C	Model Number	Part Number	Unit Price \$
9	275 CF	2.73	0.63	0.50	9D-275	100200	295
15	450 CF	4.47	0.76	0.68	15D-450	100210	350
25	450 CF	4.47	0.76	0.68	25D-450	100220	375
50*	450 CF	4.47	0.76	0.68	25D2-450	100225	695
50	600 CF	5.97	0.86	0.78	50D-600	100230	575

* Two 25-pin connectors on a 0.875-inch center-to-center dimension.

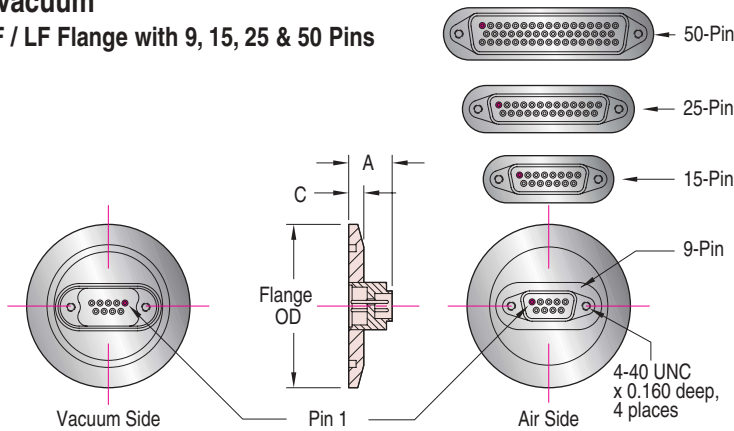


100200, 9-Pin (Air Side)



100225, 2 x 25-Pin (Vacuum Side)

High Vacuum ISO KF / LF Flange with 9, 15, 25 & 50 Pins



Special note: Pin 1 reverses position from vacuum side to air side.

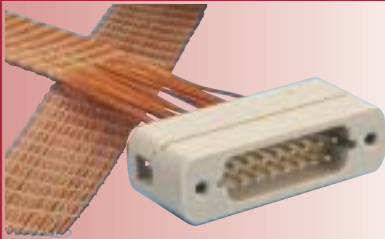
Number Contacts	ISO Flange	Flange OD	A	C	Model Number	Part Number	Unit Price \$
9	NW40 KF	2.16	0.59	0.20	9D-K40	100201	290
15	NW50 KF	2.95	0.59	0.20	15D-K50	100211	315
25	NW63 LF	3.74	0.59	0.47	25D-L63	100221	375
50	NW100 LF	5.12	0.59	0.47	50D-L100	100231	575



100211, 15-Pin (Vacuum Side)



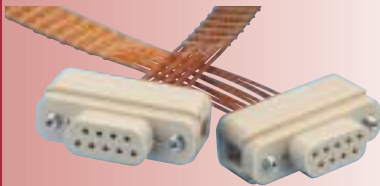
100231, 50-Pin (Air Side)



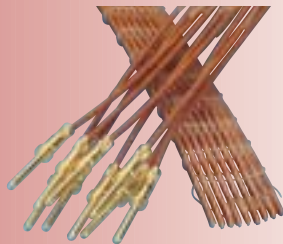
100340, Male Pin UHV Connector to Cable



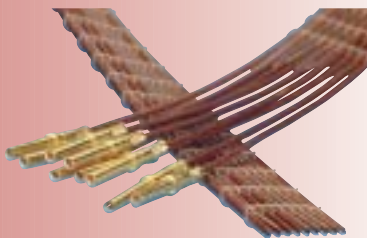
100350, Female Socket UHV Connector to Cable



100880, Female Socket UHV Connector to Connector Extension Cable



100240, Male Pin UHV Contact to Cable



100250, Female Socket UHV Contact to Cable

Ultrahigh Vacuum, Ribbon Cable Assemblies

Connector to Cable UHV ribbon cable assemblies are fitted with PEEK Subminiature-D connectors at one end and non-terminated, Kapton® insulated ribbon cable at the other. The female cable connectors mate directly onto the vacuum-side of Subminiature-D feedthroughs as shown on page 6 or with the male in-vacuum cable connectors. The ribbon cable jacket is a PEEK weave 28 AWG silver plated copper conductors, stranded 7 x 0.005.

Contact to Cable UHV ribbon cables do not include PEEK connectors. **Special note:** The 50-pin contact-fitted cable will not allow subsequent connector installation. Wires must be threaded through the connector back-piece before crimping contacts.

Number	Cable		Connector		Model Number	Part Number	Unit Price \$
	Contacts	Length	Dimensions	Type			
Connector to Cable							
9	19	0.04 x 0.40	Male	1.30 x 0.50 x 0.75	KAP-R9-19PC	100320	178
9	39	0.04 x 0.40	Male	1.30 x 0.50 x 0.75	KAP-R9-39PC	100321	225
9	19	0.04 x 0.40	Female	1.30 x 0.50 x 0.75	KAP-R9-19SC	100330	178
9	39	0.04 x 0.40	Female	1.30 x 0.50 x 0.75	KAP-R9-39SC	100331	225
15	19	0.04 x 0.74	Male	1.70 x 0.50 x 0.75	KAP-R15-19PC	100340	212
15	39	0.04 x 0.74	Male	1.70 x 0.50 x 0.75	KAP-R15-39PC	100341	272
15	19	0.04 x 0.74	Female	1.70 x 0.50 x 0.75	KAP-R15-19SC	100350	212
15	39	0.04 x 0.74	Female	1.70 x 0.50 x 0.75	KAP-R15-39SC	100351	272
25	19	0.04 x 1.20	Male	2.20 x 0.50 x 0.75	KAP-R25-19PC	100360	253
25	39	0.04 x 1.20	Male	2.20 x 0.50 x 0.75	KAP-R25-39PC	100361	325
25	19	0.04 x 1.20	Female	2.20 x 0.50 x 0.75	KAP-R25-19SC	100370	253
25	39	0.04 x 1.20	Female	2.20 x 0.50 x 0.75	KAP-R25-39SC	100371	325
50	19	0.04 x 1.20	Male	2.70 x 0.50 x 0.75	KAP-R50-19PC	100380	416
50	39	0.04 x 1.20	Male	2.70 x 0.50 x 0.75	KAP-R50-39PC	100381	560
50	19	0.04 x 1.20	Female	2.70 x 0.50 x 0.75	KAP-R50-19SC	100390	416
50	39	0.04 x 1.20	Female	2.70 x 0.50 x 0.75	KAP-R50-39SC	100391	560

Contact to Cable ~ see Special note above

9	19	0.04 x 0.40	Male	Pin Contact	KAP-R9-19P	100240	63
9	39	0.04 x 0.40	Male	Pin Contact	KAP-R9-39P	100241	110
9	19	0.04 x 0.40	Female	Socket Contact	KAP-R9-19S	100250	63
9	39	0.04 x 0.40	Female	Socket Contact	KAP-R9-39S	100251	110
15	19	0.04 x 0.74	Male	Pin Contact	KAP-R15-19P	100260	87
15	39	0.04 x 0.74	Male	Pin Contact	KAP-R15-39P	100261	147
15	19	0.04 x 0.74	Female	Socket Contact	KAP-R15-19S	100270	87
15	39	0.04 x 0.74	Female	Socket Contact	KAP-R15-39S	100271	147
25	19	0.04 x 1.20	Male	Pin Contact	KAP-R25-19P	100280	118
25	39	0.04 x 1.20	Male	Pin Contact	KAP-R25-39P	100281	190
25	19	0.04 x 1.20	Female	Socket Contact	KAP-R25-19S	100290	118
25	39	0.04 x 1.20	Female	Socket Contact	KAP-R25-39S	100291	190
50	19	0.04 x 1.20	Male	Pin Contact	KAP-R50-19P	100300	236
50	39	0.04 x 1.20	Male	Pin Contact	KAP-R50-39P	100301	380
50	19	0.04 x 1.20	Female	Socket Contact	KAP-R50-19S	100310	236
50	39	0.04 x 1.20	Female	Socket Contact	KAP-R50-39S	100311	380

Connector to Connector Extension Cable

9	19	0.04 x 0.40	Female	1.30 x 0.50 x 0.75	KAP-R9-192SC	100880	311
15	19	0.04 x 0.74	Female	1.70 x 0.50 x 0.75	KAP-R15-192SC	100890	367
25	19	0.04 x 1.20	Female	2.20 x 0.50 x 0.75	KAP-R25-192SC	100900	438
50	19	0.04 x 1.20	Female	2.70 x 0.50 x 0.75	KAP-R50-192SC	100480	696

See page 6 for **Specifications**

Air-Service, Subminiature-D Cable Assemblies & Connectors

Air service cable assemblies are 10-feet long and terminated with industry standard molded male/female Subminiature-D connectors. They have straight through, pin-to-pin wiring. Please contact factory for special cable assembly configurations.

Number Contacts	Cable Length	Connector Types	Model Number	Part Number	Unit Price \$
Connector to Connector					
9	10-foot	Male to Female	AIR-9D-10MF	101040	30
15	10-foot	Male to Female	AIR-15D-10MF	101050	40
25	10-foot	Male to Female	AIR-25D-10MF	101060	50
50	10-foot	Male to Female	AIR-50D-10MF	101070	95

Connectors Solder-Cup with Hood

9	-	Female	9D-AIR	103100	8
15	-	Female	15D-AIR	103110	10
25	-	Female	25D-AIR	103120	12
50	-	Female	50D-AIR	103130	20



101040, Male Pin-Female Socket Air Connector to Connector



100420, Male Pin UHV Connector (Contacts sold separately)

Connectors, Contacts & Crimping Tools

Components in this section are sold as the most basic components. Connectors do not include contacts and must be purchased separately. Connectors and Backshell units are made of UHV compatible PEEK material.

Number Contacts	Connector			Use Contact No.	Model Number	Part Number	Unit Price \$
	Side	Type	W x H x D				
Connectors							
9	UHV	Male	1.30 x 0.50 x 0.75	100170	9D-PKP	100400	115
9	UHV	Female	1.30 x 0.50 x 0.75	100180	9D-PKS	100440	115
15	UHV	Male	1.70 x 0.50 x 0.75	100170	15D-PKP	100410	125
15	UHV	Female	1.70 x 0.50 x 0.75	100180	15D-PKS	100450	125
25	UHV	Male	2.20 x 0.50 x 0.75	100170	25D-PKP	100420	135
25	UHV	Female	2.20 x 0.50 x 0.75	100180	25D-PKS	100460	135
50	UHV	Male	2.70 x 0.50 x 0.75	100170	50D-PKP	100430	180
50	UHV	Female	2.70 x 0.50 x 0.75	100180	50D-PKS	100470	180

Backshell Strain Relief

9	UHV	-			9D-PKBS	100445	60
15	UHV	-			15D-PKBS	100455	65
25	UHV	-			25D-PKBS	100465	70
50	UHV	-			50D-PKBS	100475	90

Contacts

1 Pack	UHV / Air	Male	0.04	—	10/pkg	GP-10	100170	20
1 Pack	UHV / Air	Female	0.04	—	10/pkg	GS-10	100180	20

Crimp Tool

1 Unit	UHV / Air	Crimping tool for male and female contacts				DCT-1	100190	395
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100470, Female Socket UHV Connector (Contacts sold separately)



100465 Backshell Strain Relief shown mounted on 100460, Female Socket UHV Connector (Connector and contacts sold separately)



100190, Contact Crimp Tool

See page 6 for **Specifications**

Thermocouple-Power hermetic Subminiature-D feedthroughs are mixed thermocouple-power contact combinations fitted on one feedthrough assembly constructed with pin arrangements designed to meet IEC 807-2 and DESC 85039 specifications.

Standard configurations include power pins, Chromel® / Alumel® Type-K thermocouple pin pairs and combinations in a single Subminiature-D shell. Straight through pins are hermetically sealed and electrically insulated in a stainless steel shell using the latest in glass-ceramic bonding technology. Ultrahigh vacuum cable assemblies with PEEK connectors and Kapton® insulated wires are available to meet the demands of UHV environments. Vacuum side cable assemblies, individual connectors and other accessories are listed on pages 12 and 13. Custom thermocouple-power assemblies are available on request, please contact the factory for more details.

Thermocouple feedthroughs do not measure temperature, but merely provide a conduit to bring the EMF signal generated at a thermocouple junction through a vacuum vessel wall to an external voltage measuring or temperature readout instrument. Type-K thermocouples with positive Chromel® wires and negative Alumel® wires are recommended for use in clean oxidizing atmospheres. The maximum operating temperature for these alloys is 1260°C for larger wire sizes. The useful temperature measuring range for a Type-K thermocouple is between -200°C to 1250°C.



Typical Installation

UHV Feedthrough, part number 100800, Conflat® compatible flange.

UHV female cable assembly, part number 100820, PEEK vacuum side connector and Kapton® insulated wire.

Air-side female cable assembly, part number 100840, Delrin® connector and cable.

Note: Connectors and cables are not included with feedthrough and must be purchased separately.

Features

- Thermocouple-Power combination
- Type-K Chromel®/Alumel® pins
- Up to 4 TC-pairs and 3 power-leads
- High temperature rated to 250°C
- UHV compatible construction
- Conflat® compatible flange mounts
- ISO compatible flange mounts
- Kapton® insulated vacuum cables
- PEEK connector with locking screws
- Air side connectors available

Specifications Notes

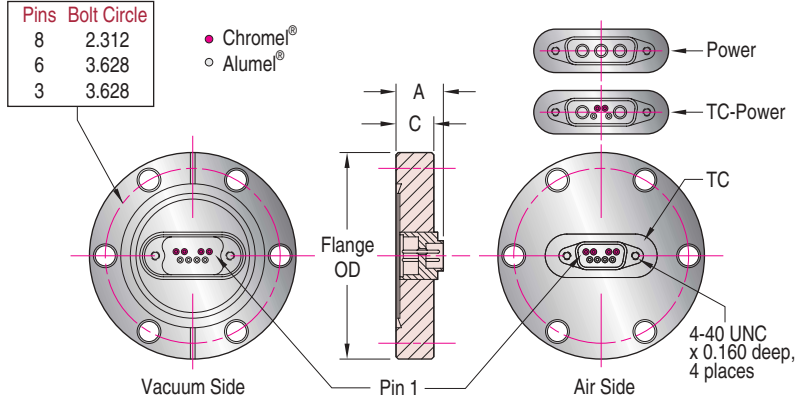
- 1 Electrical ratings are maximum test values. Thermocouples are intended for instrumentation applications carrying low level signal voltages and currents.
- 2 PEEK is a polyetheretherketone thermoplastic.
- 3 Overall assembly ratings must be adjusted to that of the lowest rated component.
- 4 All dimensions are in inches unless specified otherwise.

Specifications

Voltage¹	
Thermocouple Pins	Millivolts
Power Pins	300VDC maximum
Current	
Thermocouple Pins	Milliamps
Power Pins	20A maximum at 20°C
Material	
Shell	Stainless Steel
Thermocouple Pins	Chromel® and Alumel®
Power Pins	Ni-Fe alloy, gold plated
Seal and Insulation	Glass-Ceramic

Connector, Air	Delrin®
Connector, Vacuum ²	PEEK
Vacuum Range	
UHV, Ultrahigh vacuum	1x10 ⁻¹⁰ Torr
HV, High vacuum	1x10 ⁻⁸ Torr
Temperature Range³	
Feedthrough	250°C
Flange, CF Style	450°C
Flange, KF / LF Style	150°C
Connector, Air	80°C
Connector, Vacuum	250°C
Thermal gradient	25°C / minute maximum

Ultrahigh Vacuum CF Flange with 3, 6, & 8 Pins



Special note: Pin 1 reverses position from vacuum side to air side.

Number Contacts	TC Pairs	Power Pins	CF Flange	Flange OD	A	C	Model Number	Part Number	Unit Price \$
8	4	-	275 CF	2.73	0.59	0.50	9D-8TC-275	100790	325
6	2	2	450 CF	4.47	0.70	0.68	15D-4TC2P-450	100800	385
3	-	3	450 CF	4.47	0.70	0.68	15D-3P-450	100940	413

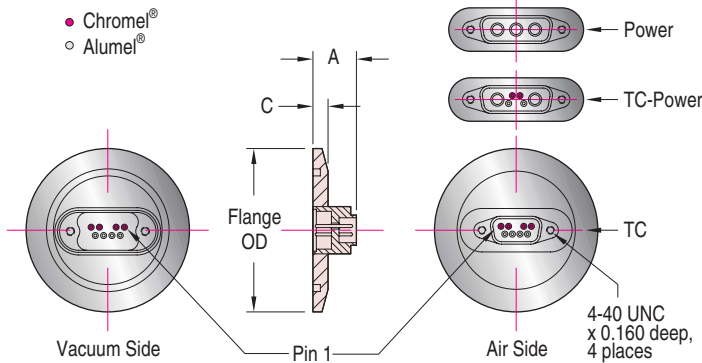


100790, UHV 4-Pair TC Feedthrough (Vacuum Side)



100800, UHV TC-Power Feedthrough (Air Side)

High Vacuum ISO KF Flange with 3, 6, & 8 Pins



Special note: Pin 1 reverses position from vacuum side to air side.

Number Contacts	TC Pairs	Power Pins	ISO Flange	Flange OD	A	C	Model Number	Part Number	Unit Price \$
8	4	-	NW40 KF	2.16	0.59	0.20	9D-8TC-K40	100791	319
6	2	2	NW50 KF	2.95	0.59	0.20	15D-4TC2P-K50	100801	347
3	-	3	NW50 KF	2.95	0.59	0.20	15D-3P-K50	100941	413



100801, HV TC-Power Feedthrough (Air Side)



100941, HV Power Feedthrough (Air Side)



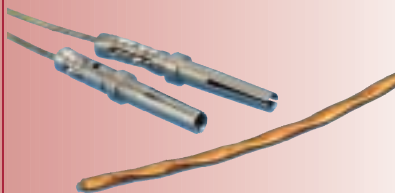
100810, Female Socket UHV Connector to Cable



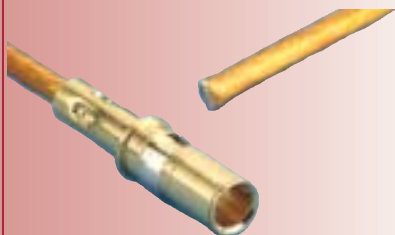
100820, Female Socket UHV Connector to Cable



100950, Female Socket UHV Connector to Cable



100850, Female Socket UHV Contact to Cable



100860, Female Socket UHV Contact to Cable

Ultrahigh Vacuum Thermocouple & Power Cables

Connector to Cable UHV assemblies are fitted with PEEK Subminiature-D connectors at one end and non-terminated Kapton® insulated cable at the other. The female socket connectors mate directly onto the vacuum-side of corresponding feedthroughs shown on pages 10 and 11. Thermocouple cable assemblies have Type-K Chromel® and Alumel® female socket contacts at one end and non-terminated Kapton® insulated 0.008 Chromel® and Alumel® single-strand wires at the opposite end. Power cable assemblies have gold plated female socket contacts at one end and non-terminated Kapton® insulated 12 AWG multi-strand wire at the other end. Thermocouple female socket contacts mate with 0.040 diameter male pins, and power female socket contacts mate with 0.142 diameter male pins.

Contact to Cable UHV leads do not include PEEK connectors. **Special note:** Individual contact fitted leads will not allow subsequent connector installation. Contact fitted thermocouple leads must be threaded through the connector back-piece before crimping contacts.

Number	Cable		Connector		Model Number	Part Number	Unit Price \$
	Length	Dimensions	Type	W x H x D			
Connector to Cable Four-Pair Type-K Thermocouple							
8	19	8 x 0.008	Female	1.30 x 0.50 x 0.75	9KAP-8TC-19SC	100810	300
8	39	8 x 0.008	Female	1.30 x 0.50 x 0.75	9KAP-8TC-39SC	100811	342
Connector to Cable Two-Pair Type-K Thermocouple / Two Power							
6	19	4x 0.008 / 2x 0.05	Female	1.70 x 0.50 x 0.75	15KAP-4TC2P-19SC	100820	279
6	39	4x 0.008 / 2x 0.05	Female	1.70 x 0.50 x 0.75	15KAP-4TC2P-39SC	100821	321
Connector to Cable Three Power							
3	19	3 x 0.05	Female	1.70 x 0.50 x 0.75	15KAP-3P-19SC	100950	213
3	39	3 x 0.05	Female	1.70 x 0.50 x 0.75	15KAP-3P-39SC	100951	244
Contact to Cable Type-K Thermocouple Leads ~ see <i>Special note above</i>							
2	19	2 x 0.008	Female	Socket Contact	KAP-TC-19S	100850	52
2	39	2 x 0.008	Female	Socket Contact	KAP-TC-39S	100851	62
Contact to Cable Power Leads ~ see <i>Special note above</i>							
1	19	1 x 0.05	Female	Socket Contact	KAP-P-19S	100860	38
1	39	1 x 0.05	Female	Socket Contact	KAP-P-39S	100861	48

See page 10 for **Specifications**

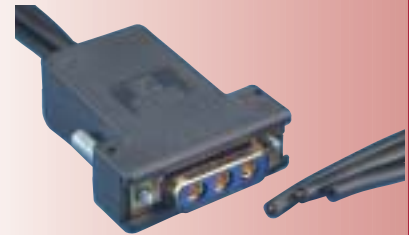
Air-Service Thermocouple & Power Cable Assemblies

Cable assemblies are fitted with Delrin® (3-Pin power uses a glass filled polyester composite) Subminiature-D connectors at one end and non-terminated PVC insulated power leads and Kapton® insulated thermocouple leads at the other. The female cable connectors mate directly onto the air side of corresponding feedthroughs shown on pages 10 and 11. Power cables are constructed with 12 AWG stranded copper conductors, while thermocouple cables are constructed with 30 AWG Chromel® and Alumel® conductors.

Number	Cable		Connector		Model Number	Part Number	Unit Price \$
	Contacts	Length	Dimensions	Type			
Connector to Cable Four-Pair Type-K Thermocouple							
8	96	8 x 0.008	Female	1.30 x 0.50 x 0.75	AIR-8TC-96SC	100830	349
Connector to Cable Two-Pair Type-K Thermocouple / Two Power							
6	96	4x 0.008/2x 0.05	Female	1.70 x 0.50 x 0.75	AIR-4TC2P-96SC	100840	250
Connector to Cable Three Power							
3	96	3 x 0.05	Female	1.70 x 0.50 x 0.75	AIR-3P-96SC	100960	178



100840, Female Socket Air Connector to Cable



100960, Female Socket Air Connector to Cable

Connectors, Contacts & Crimping Tools

UHV Subminiature-D connectors are made of PEEK and do not include contacts, which must be purchased separately. Female connectors mate directly onto the vacuum or air side of Subminiature-D feedthroughs as shown on pages 10 and 11.

- For *Type-K Connectors*, use either Chromel® (100980) or Alumel® (100990) contacts below.
- For *Power Connectors*, use Power socket (101000) contacts below.

Number	Connector			Model Number	Part Number	Unit Price \$
	Contacts	Side	Type			
Connectors Four-Pair Type-K Thermocouple						
8	UHV	Female	1.30 x 0.50 x 0.75	9D-PKS	100440	115
8	Air	Female	1.30 x 0.50 x 0.75	9D-TC-DS	101020	92
Connectors Two-Pair Type-K Thermocouple / Two Power						
6	UHV	Female	1.70 x 0.50 x 0.75	15D-TCP-PKS	100970	125
6	Air	Female	1.70 x 0.50 x 0.75	15D-TCP-DS	101030	100
Connectors Three Power						
3	UHV	Female	1.70 x 0.50 x 0.75	15D-3CX-PKS	100920	125
3	Air	Female	1.70 x 0.50 x 0.75	15D-P-DS	101010	100



100970, Female Socket UHV Connector (Contacts sold separately)



101000, Female Socket UHV/Air Power Contacts

Contacts Thermocouple & Power

1 Pack	UHV / Air	Female	0.040 Chromel® socket	5/pkg	CS-5	100980	45
1 Pack	UHV / Air	Female	0.040 Alumel® socket	5/pkg	AS-5	100990	45
1 Pack	UHV / Air	Female	0.142 Power socket	5/pkg	PS-5	101000	36
1 Unit	UHV / Air	Crimping tool for male & female TC contacts			DCT-1	100190	395
1 Unit	UHV / Air	Crimping tool for male & female power contacts			DCT-3	101080	415



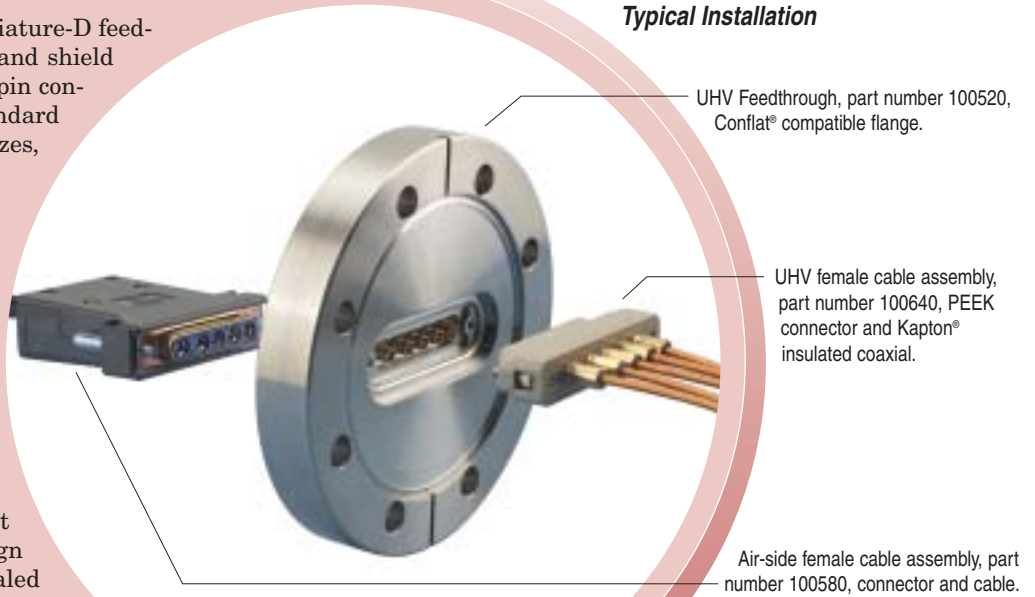
100190, Contact Crimp Tool

See page 10 for **Specifications**

Coaxial hermetic Subminiature-D feedthroughs with coaxial pin and shield are available in 1, 3 and 5 pin configurations mounted in standard 9D, 15D and 25D shell sizes, respectively.

The coaxial shield floats with respect to ground providing a secondary electrical path. The single pin coaxial feedthrough also includes four non-shielded instrumentation pins for added connection capability. Gold plated pins and shields are in a straight through pin-to-pin design and are hermetically sealed and electrically insulated in a stainless steel shell using the latest in glass-ceramic bonding technology.

Ultrahigh vacuum cable assemblies with PEEK connectors and Kapton® insulated 50-Ohm coaxial cables are available to meet the demands of UHV environments. The connection accessories must be purchased separately. Vacuum side cable assemblies, individual connectors and other accessories are listed on pages 16 and 17. Custom Subminiature-D coaxial feedthrough products are available on request.



Typical Installation

UHV Feedthrough, part number 100520, Conflat® compatible flange.

UHV female cable assembly, part number 100640, PEEK connector and Kapton® insulated coaxial.

Air-side female cable assembly, part number 100580, connector and cable.

Note: Connectors and cables are not included with feedthrough and must be purchased separately.

Features

- 1, 3, & 5 pin configurations
- Floating shield design
- Kapton® insulated, vacuum compatible 50-Ohm cables
- High temperature rated to 250°C
- UHV compatible construction
- Conflat® compatible flange mounts
- ISO compatible flange mounts
- PEEK connector with locking screws
- Air side connectors available

Specifications Notes

- 1 Electrical ratings are maximum test values. Feedthroughs are intended for instrumentation applications carrying low level signal voltages and currents.
- 2 PEEK is a polyetheretherketone thermoplastic.
- 3 Overall assembly ratings must be adjusted to that of the lowest rated component.
- 4 All dimensions are in inches unless specified otherwise.

Specifications

Voltage ¹	500VDC maximum
Current	5A maximum at 20°C
Material	
D-Shell	Stainless Steel
Coaxial Shield	Ni-Fe alloy, gold plated
Pins	Ni-Fe alloy, gold plated
Seal / Insulation	Glass-Ceramic
Connector, Air	Composite
Connector, Vacuum ²	PEEK
Cable Insulation	Kapton® Type-F Film

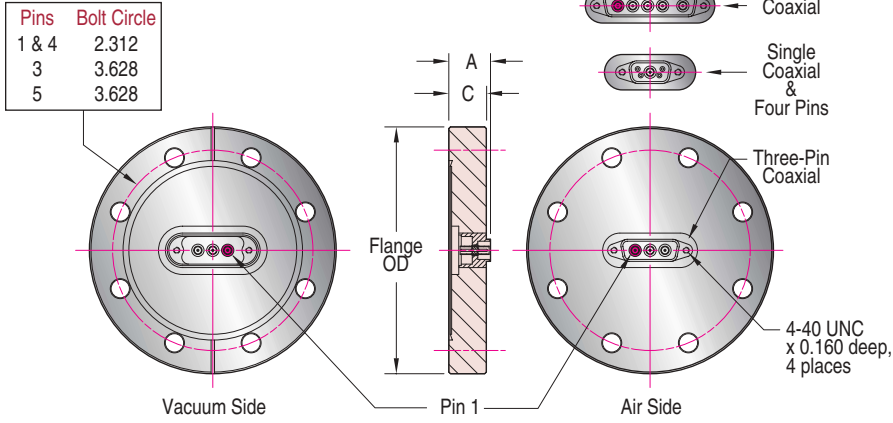
Vacuum Range

UHV, Ultrahigh vacuum	1x10 ⁻¹⁰ Torr
HV, High vacuum	1x10 ⁻⁸ Torr

Temperature Range³

Feedthrough	250°C
Flange, CF Style	450°C
Flange, KF Style	150°C
Connector, Air	80°C
Connector, Vacuum	250°C
Thermal gradient	25°C / minute maximum

Ultrahigh Vacuum CF Flange with 1, 3, & 5 Pins



Special note: Pin 1 reverses position from vacuum side to air side.

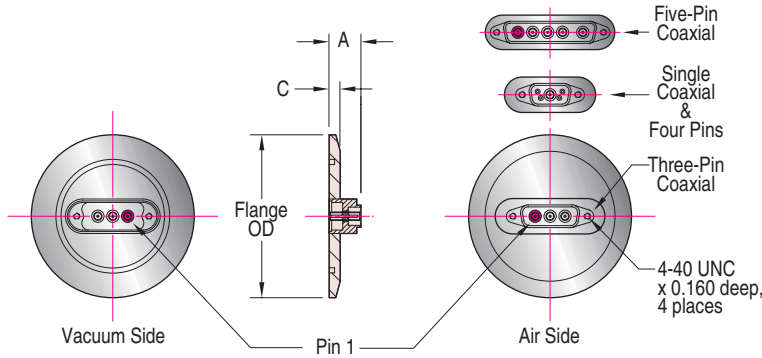
Number Coax Contacts	Instr Pins	CF Flange	Flange OD	A	C	Model Number	Part Number	Unit Price \$
5	1	275 CF	2.73	0.59	0.50	9D-1CX4i-275	100500	295
3	3	450 CF	4.47	0.68	0.68	15D-3CX-450	100510	350
5	5	450 CF	4.47	0.68	0.68	25D-5CX-450	100520	375

100500, UHV 1-Pin Coaxial + 4-Pin Instrumentation (Air Side)



100520, UHV 5-Pin Coaxial (Vacuum Side)

High Vacuum ISO KF / LF Flange with 1, 3, & 5 Pins



Special note: Pin 1 reverses position from vacuum side to air side.

Number Coax Contacts	Instr Pins	ISO Flange	Flange OD	A	C	Model Number	Part Number	Unit Price \$
5	1	NW40 KF	2.16	0.59	0.20	9D-1CX4i-K40	100501	290
3	3	NW50 KF	2.95	0.59	0.20	15D-3CX-K50	100511	315
5	5	NW63 LF	3.74	0.59	0.47	25D-5CX-L63	100521	375

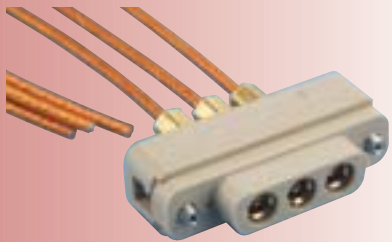
100501, HV 1-Pin Coaxial + 4-Pin Instrumentation (Air Side)



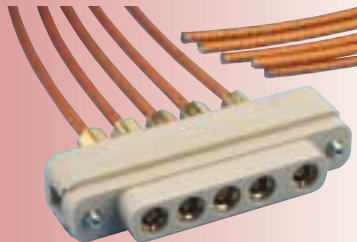
100511, HV 3-Pin Coaxial (Air Side)



100620, Female Socket UHV Combination Connector to Cable



100630, Female Socket UHV Connector to Cable



100640, Female Socket UHV Connector to Cable



100660 Female Socket UHV Coaxial Contact to Cable and 100650 Female Socket UHV Instrumentation Contact to Cable



100540, Female Socket Air Connector to Cable

Ultrahigh Vacuum Cable Assemblies Coaxial-D

Connector to Cable assemblies are constructed with UHV compatible PEEK Subminiature-D connectors and Kapton® insulated 50-ohm coaxial cables. The single coaxial connector assembly also includes four Kapton® insulated non-terminated instrumentation wires with either 19-inch or 39-inch length. These four individual leads are 28 AWG silver plated copper wire, stranded 7 x 0.005.

Contact to Cable leads are single instrumentation or 50-ohm coaxial, Kapton® insulated wires terminated on one end with gold plated female sockets that mate with feedthroughs shown on pages 14 and 15. Opposite ends have no termination. They are ideally suited for applications where Subminiature-D connectors are not required or desired.

Number Contacts	Cable		Connector		Model Number	Part Number	Unit Price \$
	Length	Dia.	Type	W x H x D			
Connector to Cable One Coaxial / Four Instrumentation							
5	19	0.09	Female	1.30 x 0.50 x 0.75	9KAP-1CX4i-19SC	100620	198
5	39	0.09	Female	1.30 x 0.50 x 0.75	9KAP-1CX4i-39SC	100621	212
Connector to Cable Three Coaxial							
3	19	0.09	Female	1.70 x 0.50 x 0.75	15KAP-3CX-19SC	100630	360
3	39	0.09	Female	1.70 x 0.50 x 0.75	15KAP-3CX-39SC	100631	408
Connector to Cable Five Coaxial							
5	19	0.09	Female	2.20 x 0.50 x 0.75	25KAP-5CX-19SC	100640	544
5	39	0.09	Female	2.20 x 0.50 x 0.75	25KAP-5CX-39SC	100641	624
Contact to Cable Instrumentation							
1	19	0.03	Female	Socket Contact	KAP-1i-19S	100650	8
1	39	0.03	Female	Socket Contact	KAP-1i-39S	100651	10
Contact to Cable Coaxial							
1	19	0.09	Female	Socket Contact	KAP-1CX-19S	100660	88
1	39	0.09	Female	Socket Contact	KAP-1CX-39S	100661	104

Air-Service Cable Assemblies Coaxial-D

Subminiature-D coaxial *Connector to Cable* assemblies are prewired with 96-inch long RG174/U coaxial cables and are non-terminated at one end. The single coaxial-D *Connector to Cable* assemblies also include a 96-inch long, four-conductor data cable with 0.18 diameter PVC cable jacket and aluminum-mylar foil shielding with a 24 AWG tinned-copper drain wire. The four individual conductors are PVC insulated 24 AWG, 7x 0.008 stranded, tinned copper wires.

Number Contacts	Cable		Connector		Model Number	Part Number	Unit Price \$
	Length	Dia.	Type	W x H x D			
Connector to Cable One Coaxial / Four Instrumentation							
5	96 / 96	0.11/0.18	Female	1.40 x 0.75 x 1.90	9AIR-1CX4i-96SC	100530	99
Connector to Cable Three Coaxial							
3	96	0.11	Female	1.70 x 0.75 x 1.90	15AIR-3CX-96SC	100540	208
Connector to Cable Five Coaxial							
5	96	0.11	Female	2.30 x 0.75 x 2.20	25AIR-5CX-96SC	100550	340

See page 14 for **Specifications**

Air-Service Cable Assemblies Coaxial-D to Male-BNC

Subminiature-D coaxial *Connector to BNC Connector* assemblies are prewired with 6-inch long RG174/U coaxial cables and terminated with male BNC connectors. The single coaxial *Connector to BNC Connector* assemblies also include a 96-inch long, four-conductor data cable with 0.18 diameter PVC cable jacket and aluminum-mylar foil shielding with a 24 AWG tinned-copper drain wire. The four individual conductors are PVC insulated 24 AWG, 7x 0.008 stranded, tinned copper wires.

Number	Cable		Connector		Model	Part	Unit
	Contacts	Length	Dia.	Type			

Connector to BNC Connector One Coaxial / Four Instrumentation
 5 6 / 96 0.11/0.18 Female 1.40 x 0.75 x 1.90 9AIR-1CX4i-06SSC **100560** 103

Connector to BNC Connector Three Coaxial
 3 6 0.11 Female 1.70 x 0.75 x 1.90 15AIR-3CX-06SSC **100570** 220

Connector to BNC Connector Five Coaxial
 5 6 0.11 Female 2.30 x 0.75 x 2.20 25AIR-5CX-06SSC **100580** 360



100570, Female Socket Air Connector to Male BNC Connectors

Air-Service Coaxial Adapter

Connector Type	End-One Termination	End-Two Termination	Model Number	Part Number	Unit Price
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BNC To SMA

Adapter BNC Female SMA Male ABA29 **100601** 17
 Adapter BNC Female SMA Female ABA588 **100590** 17

BNC To F

Adapter BNC Female F Male ABA120 **100612** 5
 Adapter BNC Female F Female ABA220 **100614** 5

BNC To N

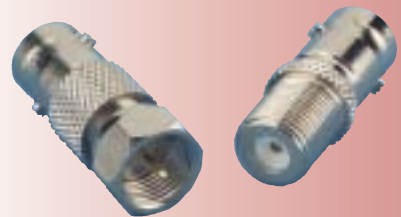
Adapter BNC Female N Male ABN109 **100616** 17
 Adapter BNC Female N Female ABN110 **100617** 17

BNC To BNC

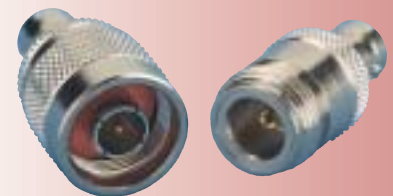
Adapter BNC Female BNC Female ABA80 **100610** 5



BNC to SMA Adapters



BNC to F-type Adapters



BNC to N-type Adapters

Connectors

UHV Subminiature-D connectors are made of PEEK and do not include contacts, which must be purchased separately. Female socket connectors mate directly onto the vacuum or air side of Subminiature-D feedthroughs as shown on pages 14 and 15.

Number	Connector		Use Contact to Cable, page 16	Model	Part	Unit
	Contacts	Type				

Connectors

1-4 * Female 1.30 x 0.50 x 0.75 100650, 51, 60, 61 9D-1CX4i-PKS **100910** 115
 3 Female 1.70 x 0.50 x 0.75 100660, 61 15D-3CX-PKS **100920** 125
 5 Female 2.20 x 0.50 x 0.75 100660, 61 25D-5CX-PKS **100930** 135

* This connector can be fitted with one coaxial and four instrumentation leads.

See page 14 for **Specifications**

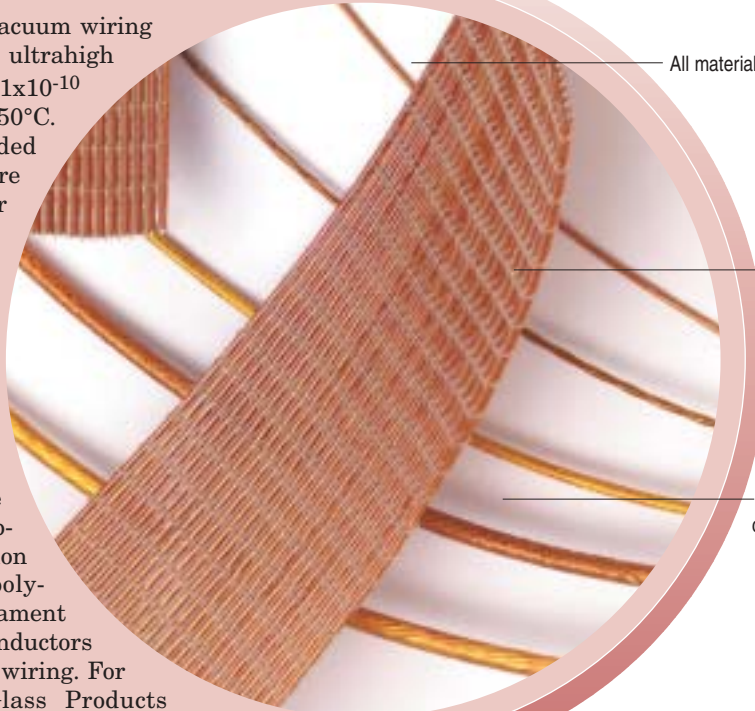


100910, 100920 and 100930 Female Socket UHV Connectors (Contact to Cable leads sold separately)

Accu-Glass Products in-vacuum wiring is designed for high and ultrahigh vacuum environments to 1×10^{-10} Torr and are bakeable to 250°C. All conductors and braided coaxial cable shielding are constructed with silver plated copper wire.

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

Multiconductor cables are available in either flat ribbon or circular configuration with an outer PEEK (polyetheretherketone) monofilament weave. Circular cable conductors are color-coded for ease of wiring. For non-coded wires, Accu-Glass Products offers colored glass identification beads in six easy to distinguish colors.



All materials are UHV compatible.

Ribbon cable provides UHV wiring in a compact assembly.

Nine styles of wire configurations.

Features

- UHV compatible construction
- High temperature rated to 250°C
- Kapton® Type-F insulating film
- Silver plated copper conductors
- Single, multi-strand and coaxial
- Type-K Thermocouple wire

Specifications Notes

- 1 Electrical ratings are maximum test values.
- 2 Overall ratings must be adjusted to that of the lowest rated component.
- 3 Thermocouple wire reference data on page 21.
- 4 All dimensions are in inches unless specified otherwise.

Specifications

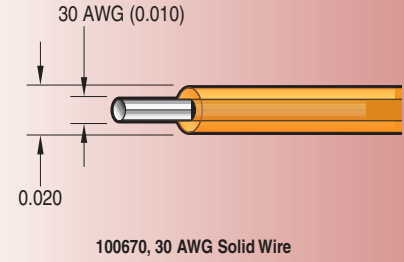
Voltage ¹	See each table
Current	See each table
Material	
Conductor	Silver plated copper
Insulation	Kapton® Type-F film
Kapton® Properties	
Dielectric constant	2.9
Dielectric strength	80kV / mm

Dissipation factor	0.001
Initial tear	13.4kg/mm
Elongation	75%
Moisture absorption	0.4% @ 50% RH
Radiation resistance	109 Rads
Vacuum Range	
UHV, Ultrahigh vacuum	1×10^{-10} Torr
Temperature Range ²	250°C

Ultrahigh Vacuum — 30 AWG Solid Wire

• 377.0 Ω/km at 20°C maximum • 600VAC, 2kVDC • 1.5 Amp

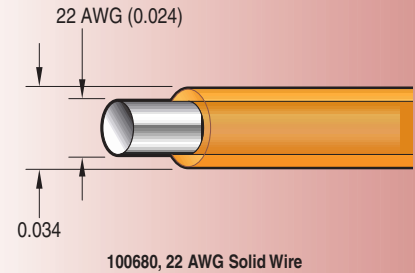
Type	Wire		Insulation Diameter	Model Number	Part Number	Unit Price \$
	Length	Diameter				
Solid	30-foot	0.010	0.020	TYP1-30	100670	29



Ultrahigh Vacuum — 22 AWG Solid Wire

• 64.3 Ω/km at 20°C maximum • 600VAC, 2kVDC • 5.5 Amp

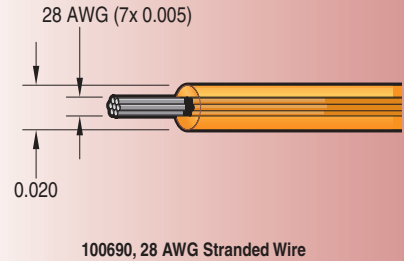
Type	Wire		Insulation Diameter	Model Number	Part Number	Unit Price \$
	Length	Diameter				
Solid	30-foot	0.024	0.034	TYP2-30	100680	34



Ultrahigh Vacuum — 28 AWG Stranded Wire

• 353.0 Ω/km at 20°C maximum • 600VAC, 2kVDC • 2 Amp

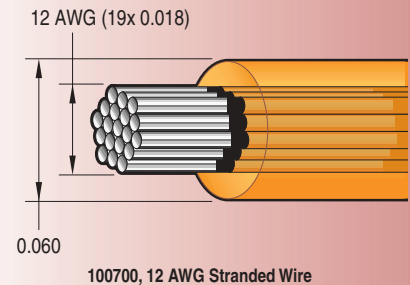
Type	Wire		Insulation Diameter	Model Number	Part Number	Unit Price \$
	Length	Diameter				
Stranded	30-foot	7x 0.005	0.020	TYP3-30	100690	37

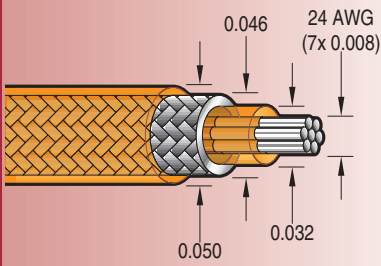


Ultrahigh Vacuum — 12 AWG Stranded Wire

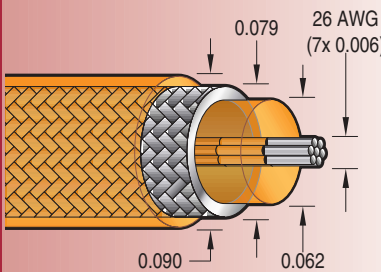
• 6.2 Ω/km at 20°C maximum • 600VAC, 2kVDC • 20 Amp

Type	Wire		Insulation Diameter	Model Number	Part Number	Unit Price \$
	Length	Diameter				
Stranded	15-foot	19x 0.018	0.060	TYP4-15	100700	116

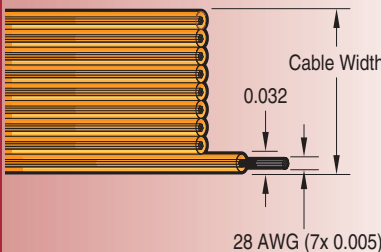




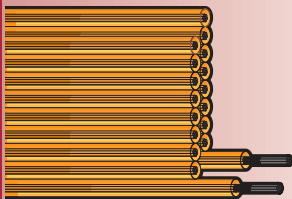
100710, 24 AWG Coaxial Cable



100720, 26 AWG 50-Ohm Coaxial Cable



100740, 28 AWG Ribbon Cable



Use 2x 25-Lead Ribbon for 50-Lead Applications

Ultrahigh Vacuum — 24 AWG Coaxial Cable

- 88.3 Ω /km at 20°C maximum
- 300 pf/m
- 600VAC, 2kVDC
- 4.5 Amp

Cable Type	Cable Length	Jacket Diameter	Shield Diameter	Insulation Diameter	Wire Diameter	Model Number	Part Number	Unit Price \$
Coaxial	15-foot	0.050	0.046	0.032	7x 0.008	TYP5-15	100710	62

Ultrahigh Vacuum — 26 AWG, 50 Ohm Coaxial Cable

- 159.0 Ω /km at 20°C maximum
- 95 pf/m
- 600VAC, 2kVDC
- 3 Amp

Cable Type	Cable Length	Jacket Diameter	Shield Diameter	Insulation Diameter	Wire Diameter	Model Number	Part Number	Unit Price \$
Coaxial	15-foot	0.090	0.079	0.062	7x 0.006	TYP6-15	100720	66

Ultrahigh Vacuum — 28 AWG, Multiconductor Ribbon Cable

Multiconductor ribbon cable with a PEEK (polyetheretherketone) woven jacket. Use two lengths of 25-pin ribbon cable for 50-pin applications.

- 244.0 Ω /km at 20°C maximum
- 600VAC, 2kVDC
- 2 Amp

Number Wires	Cable Length	Cable Width	Cable Thickness	Insulation Diameter	Wire Diameter	Model Number	Part Number	Unit Price \$
9	19	0.41	0.05	0.032	7x 0.005	KAP-R9-19	100740	45
9	39	0.41	0.05	0.032	7x 0.005	KAP-R9-39	100741	92
9	96	0.41	0.05	0.032	7x 0.005	KAP-R9-96	100742	203
15	19	0.74	0.05	0.032	7x 0.005	KAP-R15-19	100750	57
15	39	0.74	0.05	0.032	7x 0.005	KAP-R15-39	100751	117
15	96	0.74	0.05	0.032	7x 0.005	KAP-R15-96	100752	257
25	19	1.22	0.05	0.032	7x 0.005	KAP-R25-19	100760	68
25	39	1.22	0.05	0.032	7x 0.005	KAP-R25-39	100761	140
25	96	1.22	0.05	0.032	7x 0.005	KAP-R25-96	100762	311

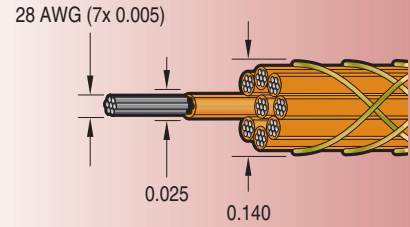
See page 18 for **Specifications**

Ultrahigh Vacuum — 28 AWG, Multiconductor Round Cable

Nine conductor cable with a PEEK (polyetheretherketone) woven jacket.

- 244.0 Ω/km at 20°C maximum
- 600VAC, 2kVDC
- 2 Amp

Number Wires	Cable Length	Jacket Diameter	Shield Diameter	Insulation Diameter	Wire Diameter	Model Number	Part Number	Unit Price \$
9	19-inch	0.140	-	0.025	7x 0.005	KAP-C9-19	100730	24
9	39-inch	0.140	-	0.025	7x 0.005	KAP-C9-39	100731	49
9	96-inch	0.140	-	0.025	7x 0.005	KAP-C9-96	100732	109

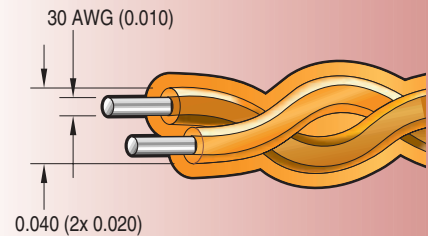


100730, 28 AWG 9-Conductor Round Cable

Ultrahigh Vacuum — 30 AWG Solid Thermocouple Wire

Type-K thermocouple wire pairs consist of non-welded positive Chromel® and negative Alumel® legs.

Type	Wire Length	Wire Diameter	Insulation Diameter	Model Number	Part Number	Unit Price \$
Type-K	19-inch	2x 0.010	0.020	TYP7-19	100770	13
Type-K	39-inch	2x 0.010	0.020	TYP7-39	100771	27
Type-K	96-inch	2x 0.010	0.020	TYP7-96	100772	67



100770, Type-K Thermocouple Pair

Thermocouple Wire Reference Data, ANSI Type-K

Thermocouple feedthroughs do not measure temperature, but provide a conduit to bring the EMF signal generated at a thermocouple junction through a vacuum vessel wall to an external voltage measuring or temperature readout instrument. Type-K thermocouples with positive Chromel® wires and negative Alumel® wires are recommended for use in clean oxidizing atmospheres. The maximum operating temperature for these alloys is 1260°C for larger wire sizes. The useful temperature measuring range for a Type-K thermocouple is between -200°C to +1250°C.

Pair Material	Polarity	Metal	Min. Junction Temperature	Max. Junction Temperature	EMF Range
Chromel®	Positive	Base	-200°C	+1250°C	-5.97mV to 50.63mV
Alumel®	Negative				

Ultrahigh Vacuum — Color-Coded Identification Beads

Accu-Glass Products vacuum compatible colored glass beads are ideally suited for identifying Kapton® insulated vacuum wiring which have no other means of identification. Each kit consists of six individual packs of 50 beads totaling six different colors and 300 beads. The six standard colors are green, grey, blue, white, brown and black.

Wire Type	Inside Diameter	Outside Diameter	Bead Length	Maximum Wire Diameter	Model Number	Part Number	Unit Price \$
All	0.04	0.080	0.09	0.035	CiB-1	100780	37

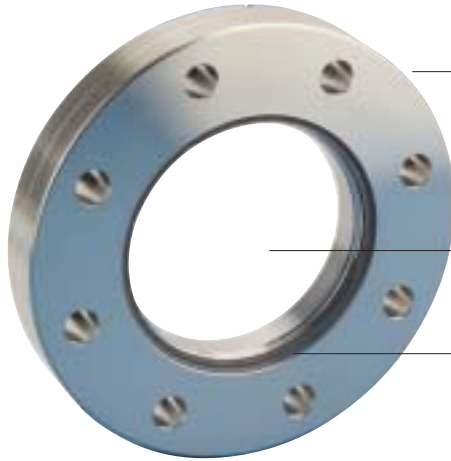


100780, Color-coded identification beads

Accu-Glass Products zero-profile VPHT series high transmission glass viewports are an economical replacement for Corning® type 7056 glass viewports. Transmission is greater than 90% over the 375nm to 1900nm wavelength range.

The glass-to-metal seal employs the latest bonding technology, carefully matching the coefficients of expansion for stainless steel, glass window and the glass frit sealing compound, assuring a uniform and rugged compression seal over the entire operational range of the viewport.

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



Three high vacuum and three ultrahigh vacuum flange sizes

High transmission glass

Glass frit sealing

Features

- High transmission glass
- High temperature rated to 270°C
- UHV compatible construction
- All 304 stainless steel construction
- Conflat® compatible flange mounts
- ISO compatible flange mounts
- 0.38, 0.50, 0.88, 1.5, and 2.5 inch view diameters
- Non-magnetic

Specifications

Specifications Notes

- 1 Overall assembly ratings must be adjusted to that of the lowest rated component.
- 2 All dimensions are in inches unless specified otherwise.

Material

Flange	Stainless Steel
Viewport	High Transmission Glass
Seal	Glass Frit

Vacuum Range

UHV, Ultrahigh vacuum	1x10 ⁻¹⁰ Torr
HV, High vacuum	1x10 ⁻⁸ Torr

Temperature Range¹

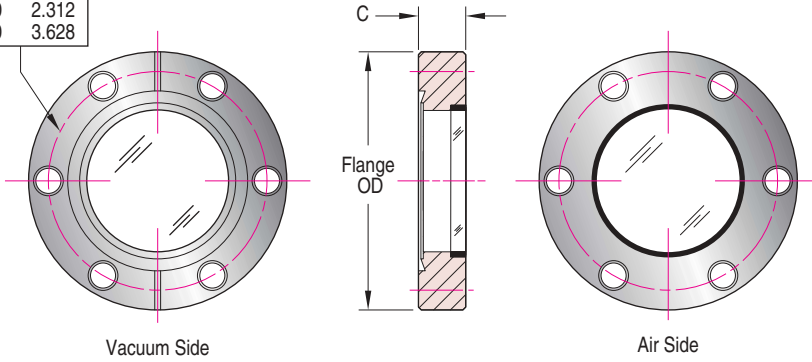
Glass-to-metal Seal	300°C
Flange, CF Style	450°C
Flange, KF / LF Style	150°C

Transmission Range

375nm-1900nm	90%
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**Ultrahigh Vacuum
CF Flange**

View Dia.	Bolt Circle
0.50	1.062
1.50	2.312
2.50	3.628



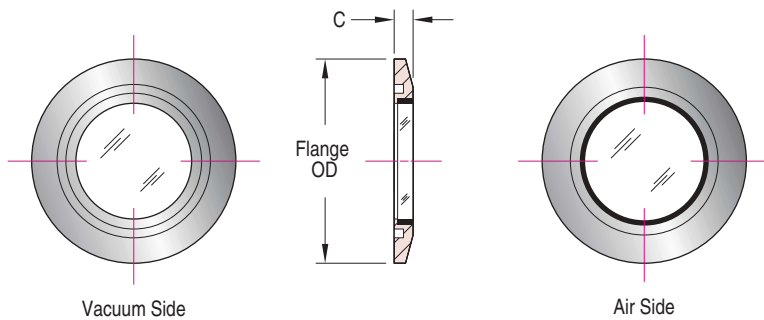
102020, UHV Viewport (Air Side)



102030, UHV Viewport (Vacuum Side)

View Diameter	CF Flange	Flange OD	Glass Thickness	C	Model Number	Part Number	Unit Price \$
0.50	133 CF	1.33	0.160	.285	VPHT-133	102010	87
1.50	275 CF	2.73	0.160	.500	VPHT-275	102020	97
2.50	450 CF	4.47	0.160	.680	VPHT-450	102030	189

**High Vacuum
ISO KF / LF Flange**



102040, HV Viewport (Air Side)



102050, HV Viewport (Air Side)

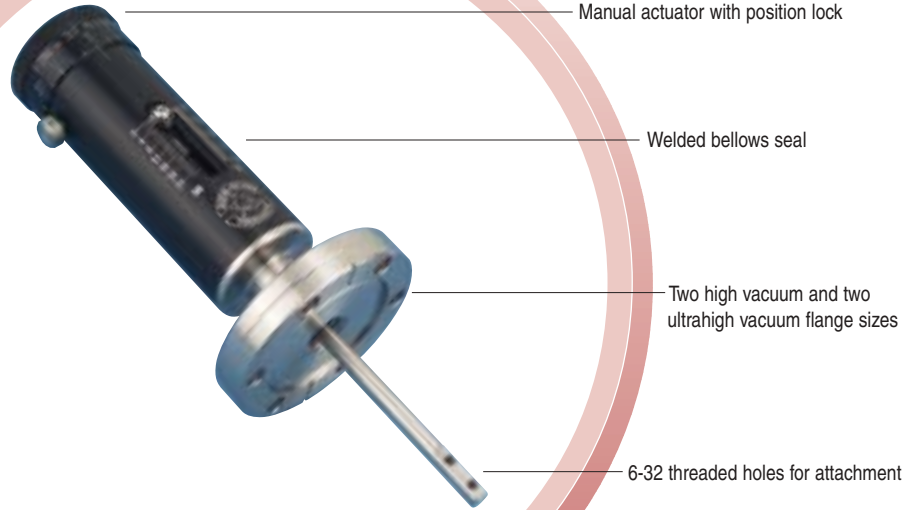
View Diameter	ISO Flange	Flange OD	Glass Thickness	C	Model Number	Part Number	Unit Price \$
0.38	NW16 KF	1.18	0.160	.330	VPHT-K16	102040	96
0.88	NW40 KF	2.16	0.160	.200	VPHT-K40	102050	99
2.50	NW63 LF	5.12	0.160	.470	VPHT-L63	102060	180

Accu-Glass Products precision HTL series linear motion feedthroughs are designed to operate at temperatures as high as 250°C. Linear movement is measured in 0.001 inch increments on the rotary barrel scale and 0.025 inch increments on the linear body scale, which are laser etched into the black anodized aluminum finish.

They are constructed of aluminum and stainless steel, where only stainless steel surfaces are exposed to the vacuum environment.

In vacuum bearings are film lubricated with a UHV compatible Krytox® lubricant, while air side bearings are lubricated with high-temperature Krytox® lubricant. The linear shaft is sealed with an AM-350 edge-welded bellows.

Feedthroughs are available on Conflat® style CF metal seal or ISO-KF style elastomer seal flanges.



Features

- 1 and 2 inch linear travel
- High temperature rated to 250°C
- UHV compatible construction
- Conflat® compatible flange mounts
- ISO compatible flange mounts
- Welded bellows seal
- Manual actuator
- Linear position lock

Specifications Notes

- 1 Overall assembly ratings must be adjusted to that of the lowest rated component.
- 2 All dimensions are in inches unless specified otherwise.

Specifications

Material	
Body	Stainless Steel
Housing	Anodized Aluminum
Bellows, Edge-Welded	AM-350
Vacuum Range	
UHV, Ultrahigh vacuum	1x10 ⁻¹⁰ Torr
HV, High vacuum	1x10 ⁻⁸ Torr

Temperature Range¹

Feedthrough	250°C
Flange, CF Style	450°C
Flange, KF / LF Style	150°C

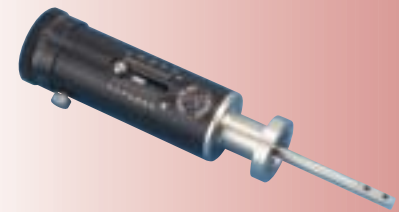
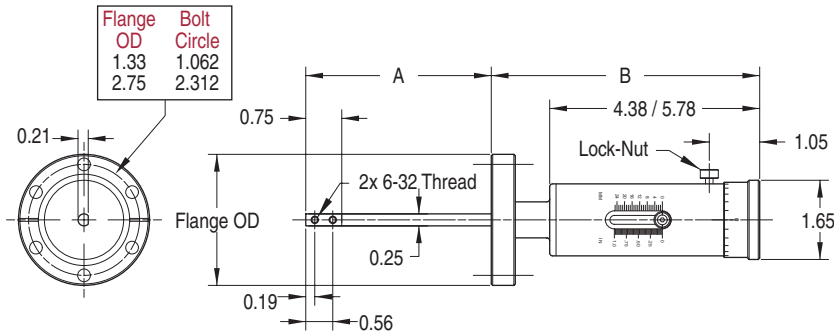
Load

Axial	5 lb maximum
Lateral	5 lb at 2 inch extension maximum

Resolution

Linear Scale	0.025 Inch
Rotary Scale	0.001 Inch

Ultrahigh Vacuum CF Flange



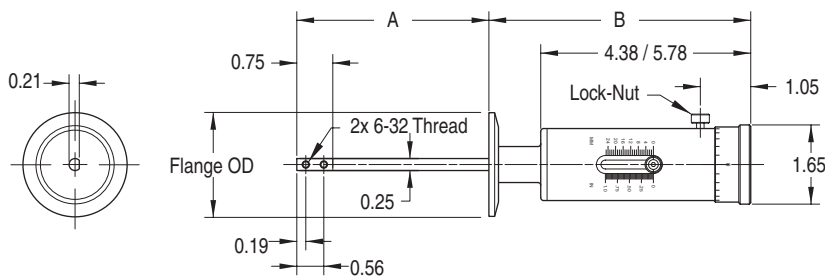
102200, UHV 1-inch Linear Feedthrough



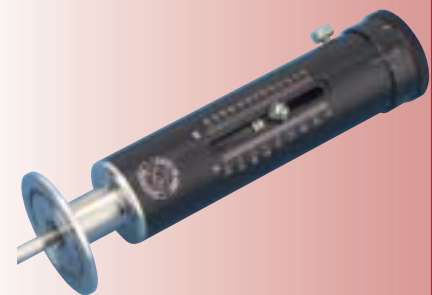
102230, UHV 2-inch Linear Feedthrough

Linear Travel	CF Flange	Flange OD	A		B	Model Number	Part Number	Unit Price \$
			Min.	Max.				
1.0	133 CF	1.33	3.55	4.55	5.50	HTL-133-1	102200	485
1.0	275 CF	2.73	3.55	4.55	5.50	HTL-275-1	102220	500
2.0	133 CF	1.33	3.55	5.55	6.90	HTL-133-2	102210	615
2.0	275 CF	2.73	3.55	5.55	6.90	HTL-275-2	102230	630

High Vacuum ISO KF Flange



102250, HV 1-inch Linear Feedthrough



102280, HV 2-inch Linear Feedthrough

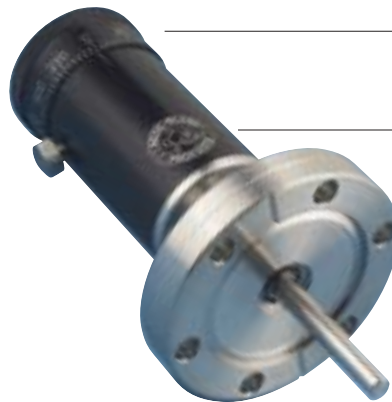
Linear Travel	ISO Flange	Flange OD	A		B	Model Number	Part Number	Unit Price \$
			Min.	Max.				
1.0	NW16 KF	1.18	3.50	4.50	5.56	HTL-K16-1	102250	480
1.0	NW40 KF	2.16	3.60	4.60	5.46	HTL-K40-1	102270	495
2.0	NW16 KF	1.18	3.50	5.50	6.96	HTL-K16-2	102260	610
2.0	NW40 KF	2.16	3.60	5.60	6.86	HTL-K40-2	102280	625

Accu-Glass Products high-torque HTR series rotary motion feedthroughs are designed to operate at temperatures as high as 250°C and rotational torque up to 100 in-oz.

They are constructed of black-anodized aluminum and stainless steel, where only stainless steel surfaces are exposed to the vacuum environment.

In vacuum bearings are dry-film lubricated with tungsten-disulfide, while air side bearings are lubricated with high-temperature Krytox® lubricant. The rotation shaft is sealed with an AM-350 edge-welded bellows.

Feedthrough rotation can be monitored *via* a 360° / 5° increment laser-etched scale found on the manual actuator knob. Rotary feedthroughs are available on Conflat® style CF metal seal or ISO-KF style elastomer seal flanges.



Manual actuator

Welded bellows seal

Two high vacuum and two ultrahigh vacuum flange sizes

Features

- High torque rated to 100 in-oz
- High temperature rated to 250°C
- UHV compatible construction
- Conflat® compatible flange mounts
- ISO compatible flange mounts
- Welded bellows seal
- Manual actuator
- Continuous rotary motion
- Rotary position lock

Specifications

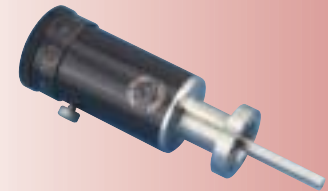
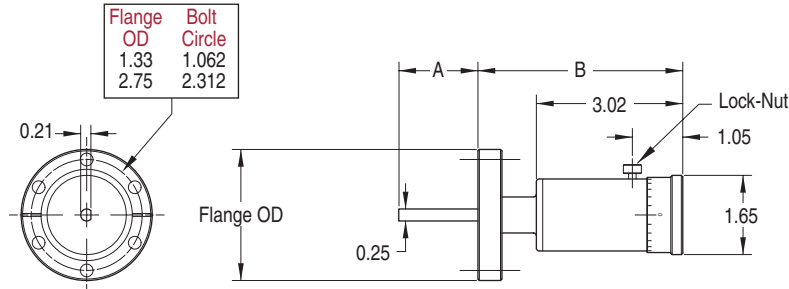
Specifications Notes

- 1 Overall assembly ratings must be adjusted to that of the lowest rated component.
- 2 All dimensions are in inches unless specified otherwise.

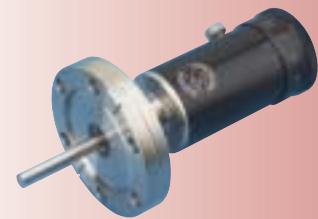
Material	
Body	Stainless Steel
Housing	Anodized Aluminum
Bellows, Edge-Welded	AM-350
Vacuum Range	
UHV, Ultrahigh vacuum	1x10 ⁻¹⁰ Torr
HV, High vacuum	1x10 ⁻⁸ Torr
Temperature Range ¹	
Feedthrough	250°C
Flange, CF Style	450°C

Flange, KF / LF Style	150°C
Load	
Torque	100 in-oz maximum
Axial	6 lb maximum
Lateral	10 lb maximum
Speed	
Rotary	1000 RPM
Resolution	
Rotary Scale	5° (Degrees)

Ultrahigh Vacuum CF Flange



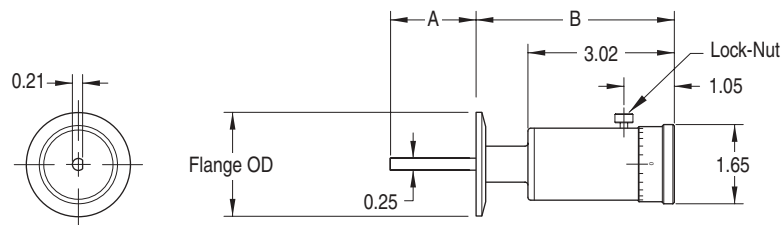
102100, UHV Rotary Feedthrough



102110, UHV Rotary Feedthrough

Rotary Travel	CF Flange	Flange OD	A	B	Model Number	Part Number	Unit Price \$
360°	133 CF	1.33	1.57	4.17	HTR-133	102100	450
360°	275 CF	2.73	1.57	4.17	HTR-275	102110	465

High Vacuum ISO KF Flange



102140, HV Rotary Feedthrough



102150, HV Rotary Feedthrough

Rotary Travel	ISO Flange	Flange OD	A	B	Model Number	Part Number	Unit Price \$
360°	NW16 KF	1.18	1.52	4.22	HTR-K16	102140	440
360°	NW40 KF	2.16	1.62	4.12	HTR-K40	102150	455



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- A or Amp** Ampere, a measure of electrical current.
- Alumel®** The trade name for a nickel alloy that is used with Chromel® in thermocouples; a registered trademark of Hoskins Manufacturing Company.
- AM-350** A type of stainless steel.
- AWG** American Wire Gauge.
- BNC** Bayonet Naval Connector.
- CF** The abbreviation for a Conflat-compatible metal sealed vacuum flange.
- Chromel®** An alloy that is predominantly nickel with chromium that is used with Alumel® in thermocouples; a registered trademark of Hoskins Manufacturing Company.
- Conflat®** A registered trademark of Varian Corporation, the original metal sealed flange.
- Delrin®** An insulating plastic that is machinable and non-marring; a registered trademark of E.I. du Pont de Nemours and Company.
- Dia.** Diameter.
- EMF** Electromagnetic Frequency.
- HV** High Vacuum, generally in the range of 10^{-6} Torr.
- in-oz** inch-ounce, a US system measure of torque.
- ISO** International Standards Organization.
- Jack** The name of a female connector, consisting of one or more sockets.
- Kapton®** A polyimide material in film; a compact, lightweight, and mechanically tough insulation material; it has very low outgassing properties, making it ideal for use in UHV applications; a registered trademark of E.I. du Pont de Nemours and Company.
- KF** The abbreviation for small elastomer sealed vacuum flanges joined with a single clamp.
- kg/mm** kilograms per millimeter.
- Krytox®** A vacuum compatible lubricant; a registered trademark of the DuPont Company.
- kVDC** kilovolt Direct Current, a measure of voltage.
- kV/mm** kilovolt per millimeter.
- lb** pound, a US system measure of weight or force.
- LF** The abbreviation for a large elastomer sealed vacuum flange joined with a series of clamps.
- Mylar®** A strong polyester film that has superior strength, heat resistance, and excellent insulating properties; a registered trademark of E.I. du Pont de Nemours and Company.
- mV** millivolt.
- nm** nanometer, 10^{-9} meters.
- No.** The abbreviation for Number.
- Non-terminated** Bare wires without any connector attached.
- NW** The German abbreviation for nominal diameter.
- PEEK** polyetheretherketone; a crystalline material with excellent mechanical and electrical insulation properties; it has very low outgassing properties, making it ideal for use in UHV applications.
- pf/m** picofarads per meter, a measure of capacitance.
- Pin** The name of a single male connector; plug.
- pkg** The abbreviation for package.
- Plug** The name of a male connector, consisting of one or more pins.
- p/n** The abbreviation for part number.
- PVC** Polyvinyl chloride.
- RH** Relative Humidity.
- RPM** Revolutions per minute, a measure of rotational speed.
- SMA** A high frequency coaxial feedthrough designed per Mil Spec Mil-C-39012/58F
- Socket** The name of a female connector, either accepting a single pin or a plug.
- Rads** A measure of radiation.
- UHV** Ultrahigh vacuum, generally in the range of 10^{-8} Torr or better.
- UNC** Unified National Coarse, a standard thread designation.
- V** Volt, a measure of electrical voltage.
- VAC** Volt Alternating Current.
- VDC** Volt Direct Current.
- V/mm** Volt per millimeter.
- &** The symbol for "and".
- Ω The symbol for ohm, a measure of electrical resistance.
- Ω/km Ohms per kilometer, a measure of electrical resistance.



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Vacuum Feedthroughs, Inside and Out

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