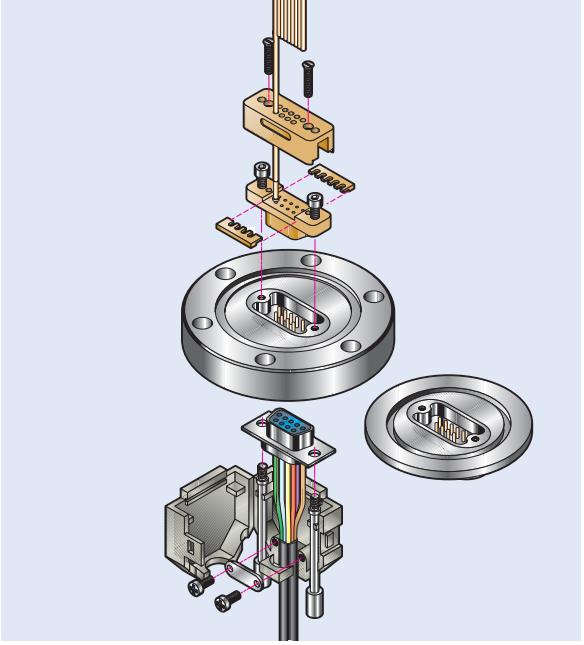
Connectivity

Multipin feedthroughs



Welcome to the new MDC Vacuum Catalogue

In these pages you will find a range of standard components that offer true air-to-vacuum electrical connectivity. We present solutions that begin at the vacuum application, continue through the vacuum vessel wall and end at the users external air-side instrumentation.

We call these solutions :

MDC Vacuum Connectivity

The feedthroughs we present here have been designed and engineered with both air and vacuum compatible connection accessories. Some products are sold as complete kits and others as optional accessories for maximum user integration and flexibility.

These feedthroughs complement the extensive range of components available in our comprehensive 'Vacuum Science Solutions' catalogue, at www.mdcvacuum.co.uk

The hermetic seals in this brochure meet the requirements of MIL-STD-883 for hermeticity =1x10^{-9} cc/sec He at one atmosphere, **insulation resistance** >5,000Mohm at 500VDC **and dielectric withstanding voltage** no breakdown at 100VAC/mil

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MDC 0112

Subminiature-C

9, 23, 37 and 60 pins

Feedthrough, cables and connector kit C9 KIT-C16 shown

Subminiature-C, the latest addition to a comprehensive line of glass-to-metal, hermetically sealed instrumentation feedthroughs.

This is a circular geometry 9 pin feedthrough designed for applications where space is at a premium or where conventional Subminiature Type-D connections will not fit. Its circular geometry allows the installation of this product into very small vacuum flanges including the popular DN16CF and KF flanges. 9 gold plated pins are hermetically sealed and electrically insulated in a stainless steel shell using the latest in glass-ceramic bonding technology.

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.

All in-vacuum connector screws are vented where required.

The feedthroughs mating-screw boss doubles as a polarising key.

Air to vacuum pin positions are identified with a permanent surface indentation to facilitate the pin assignment operation.

Features

- 9, 23, 37 and 60 pin instrumentation feedthroughs
- UHV compatible construction
- Conflat® and KF mounting flanges
- High temperature rated to 250°C maximum
- Leak tight to 2 x 10^{-10} std. cc/sec of helium
- Air and vacuum connectors available

Specifications

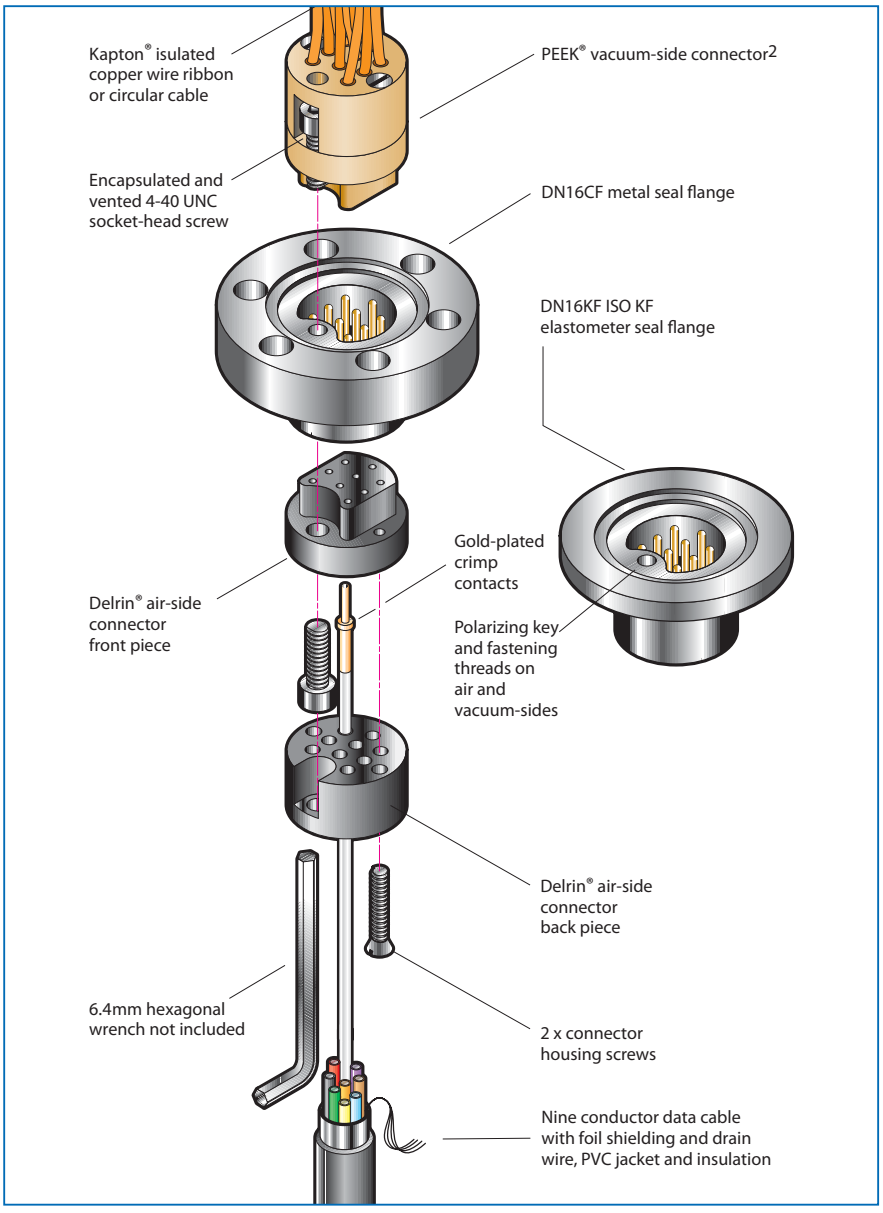
Voltage / Current ratings [1]	
9 pin	1000VDC / 10A (60A max.)
23 pin	1000VDC / 7A (105A max.)
37 pin	1000VDC / 7A (170A max.)
60 pin	1000VDC / 7A (275A max.)
Material	
Shell	Stainless steel
Pins	BeCu gold plated
Seal / Insulation	Ceramic
Connector	
Air	Delrin® [3]
Vacuum	PEEK® [2]
Vacuum range	
UHV (CF)	1 x10^{-10} mbar
HV (KF)	1 x10^{-8} mbar
Temperature range [4]	
Feedthrough – CF	250°C
Feedthrough – KF	200°C
Connector – Air	80°C
Connector – Vacuum	250°C
Thermal gradient	25°C per minute max.

[1] Electrical ratings are maximum test values. Feedthroughs are intended for instrumentation applications carrying low level signal voltages and currents. Current ratings shown are maximum per pin (and maximum per feedthrough).

[2] PEEK® is a Polyether-Etherketone thermoplastic.

DELRIN® is an Acetal Homopolymer.

[3] Overall assembly ratings must be adjusted to that of the lowest rated component.



All dimensions are nominal in millimetres unless specified.

Subminiature-C
9 pins

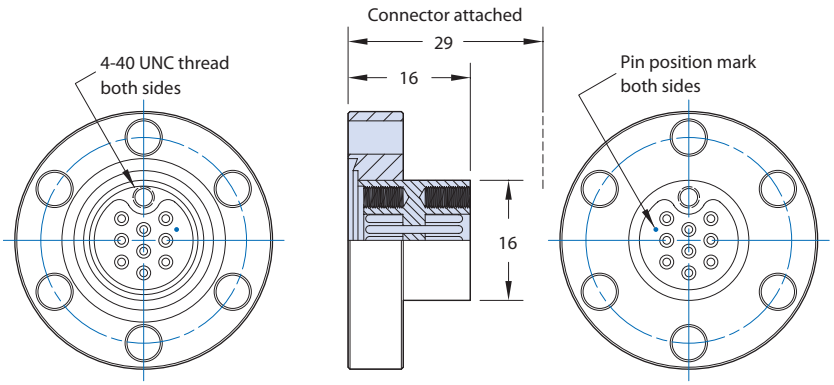
UHV **CF Flange with 9 pins**

No. of pins	Flange	Description	Reference	Part number
9	DN16CF	Feedthrough, vacuum cable and air-side connector	C9KIT-C16	**1512604**
9	DN16CF	Feedthrough only	C9-C16	**1512600**
9	–	UHV Vacuum PEEK® Connector - male	C9-VCP	**1512606**
9	–	UHV Vacuum PEEK® Connector - female	C9-VCS	**1512603**
9	–	UHV Vacuum Delrin® Connector - female	C9-ACS	**1512606**
9	–	Male Crimps (for C9-VCP) pack 10	DPINMC-10	**1510103**
9	–	Female Crimps (for C9-VCS) pack 10	DPINFC-10	**1510102**

[1] Contains air and vacuum-side connectors with 96 inch **2438mm** and 19 inch **482mm** cable lengths respectively.

[2] This is the stand-alone feedthrough and does not include air or vacuum-side connectors.

Note 23, 37 and 60 pin vacuum connectors include a set of crimp connectors – 9 pin do not.



C9KIT-C16

C9-C16

C9KIT-K16

C9-K16

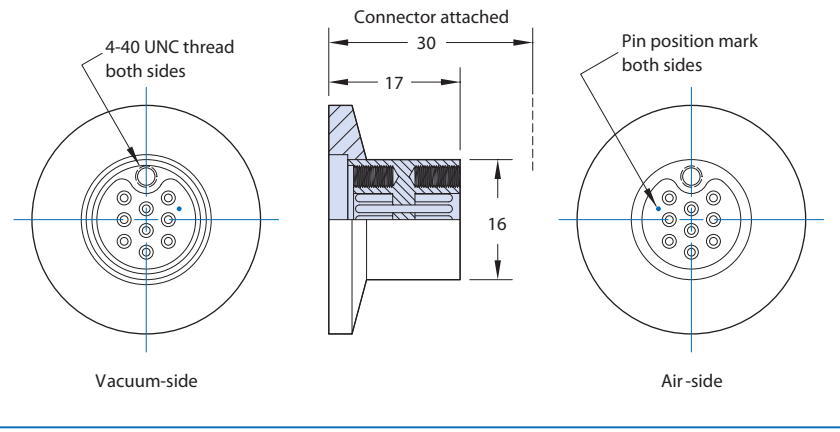
UHV **KF Flange with 9 pins**

No. of pins	Flange	Description	Reference	Part number
9	KF16	Feedthrough, vacuum cable and air-side connector	C9KIT-K16	**1512605**
9	KF16	Feedthrough only	C9-K16	**1512601**

[1] Contains air and vacuum-side connectors with 96 inch **2438mm** and 19 inch **482mm** cable lengths respectively.

[2] This is the stand-alone feedthrough and does not include air or vacuum-side connectors.

Note 23, 37 and 60 pin vacuum connectors include a set of crimp connectors – 9 pin do not.



All dimensions are nominal in millimetres unless specified.

Subminiature-C
23 pins

Complete air-to-vacuum instrumentation connectivity

Features

- UHV compatible materials
- UHV temperature rated to 350°C
- Gold plated pins
- Kapton® insulated UHV ribbon cable
- Two standard vacuum mounting styles
- Custom feedthrough configurations available upon request

Specifications

Voltage [1]	
23 pin	300VDC maximum
Current	
Per pin amperage	10 Amps per pin
Total amperage	105 Amps all pins loaded
Material	
Shell	Stainless steel
Pins	BeCu alloy, gold plated
Seal/Insulation	Ceramic
Vacuum range	
UHV	1 x10^{-10} mbar
HV	1 x10^{-8} mbar
Temperature range [2]	
Feedthrough – CF	-200°C to 350°C
Feedthrough – KF	-20°C to 150°C
Air-side connector	-55°C to 80°C
Vacuum-side connector	-200°C to 250°C
Dimensions	Reference only, subject to change

[1] **See intented operating conditions** in introductory section

[2] Overall assembly ratings must be adjusted to that of the lowest rated component

UHV and HV series

CF Mount

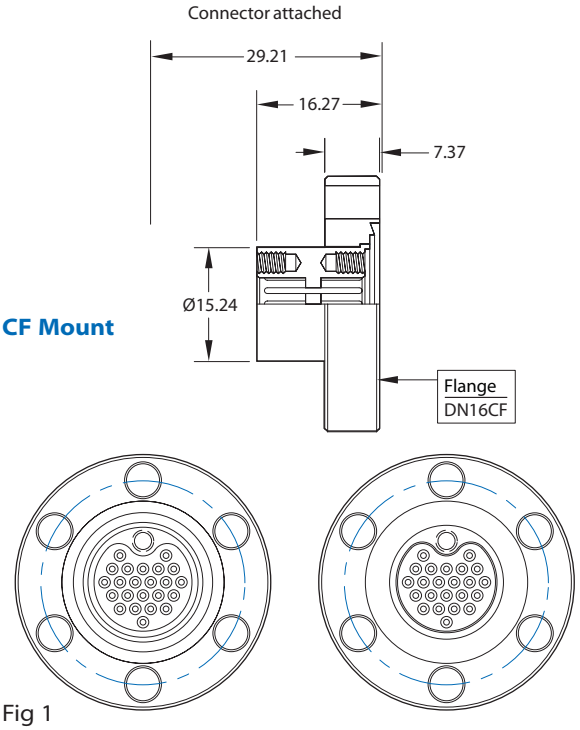


Fig 1

End views Air and vacuum-side

ISO KF Mount

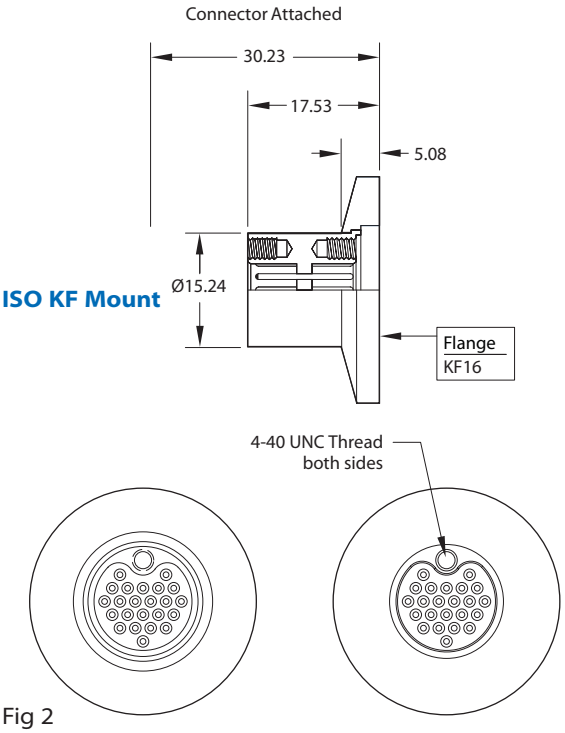


Fig 2

End views Air and vacuum-side

All dimensions are nominal in millimetres unless specified.

Subminiature-C
23 pins

CF

No. of pins	Flange	Description	Reference	Part number
23	DN16CF	Feedthrough, cable and connector kit	C23KIT-C16	**1520000**
23	DN16CF	Feedthrough only	C23-C16	**1520006**

ISO KF

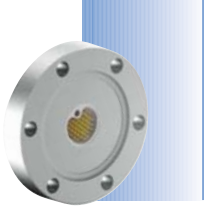
No. of pins	Flange	Description	Reference	Part number
23	KF16	Feedthrough, cable and connector kit	C23KIT-K16	**1520001**
23	KF16	Feedthrough only	C23-K16	**9153007**

Accessories

No. of pins	Flange	Description	Reference	Part number
23	–	Air-side UHV Vacuum PEEK® Connector - female	C23-VCS	**1520004**
23	–	Vacuum-side Delrin® Connector - female	C23-ACS	**1520003**
–	–	Female crimps (for C23-VCS) pack 25	CPIN-FC-23	**1520002**

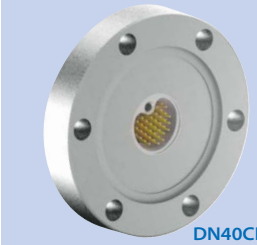
Accessory type	Length ins mm	Reference	Part number
Vacuum-side connector and cable assemly	19" **482**	C23-VACCAB19	**9924079**
Air-side connector and cable assemly	96" **2438**	C23-AIRCAB96	**9324086**

All dimensions are nominal in millimetres unless specified.



Subminiature-C
37 pins

CF

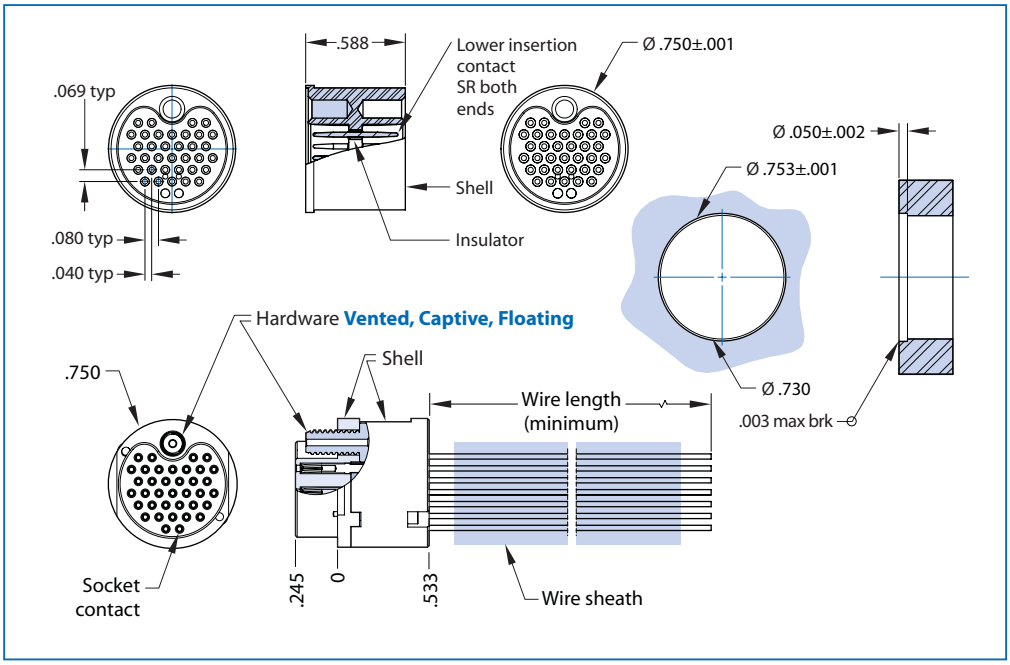


No. of pins	Flange	Description	Reference	Part number
37	DN40CF	Feedthrough, vacuum cable and air-side connector kit [1]	C37KIT-C40	**1520100**
37	DN40CF	Feedthrough only [2]	C37-C40	**1520110**

[1] Contains air and vacuum-side connectors with 96 inch **2438mm** and 19 inch **482mm** cable lengths respectively.

[2] This is the stand-alone feedthrough and does not include air or vacuum-side connectors.

Note 23, 37 and 60 pin vacuum connectors include a set of crimp connectors – 9 pin do not.



KF

No. of pins	Flange	Description	Reference	Part number
37	KF40	Feedthrough, vacuum cable and air-side connector kit [1]	C37KIT-K40	**1520101**
37	KF40	Feedthrough only [2]	C37-K40	**1520111**

[1] Contains air and vacuum-side connectors with 96 inch **2438mm** and 19 inch **482mm** cable lengths respectively.

[2] This is the stand-alone feedthrough and does not include air or vacuum-side connectors.

Note 23, 37 and 60 pin vacuum connectors include a set of crimp connectors – 9 pin do not.

Accessories

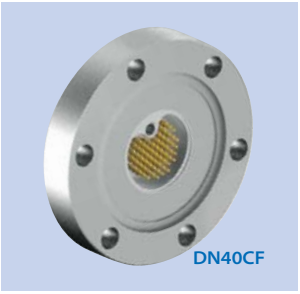
No. of pins	Flange	Description	Reference	Part number
37	–	Air-side UHV Vacuum PEEK® Connector - female	C37-VCS	**1520104**
37	–	Vacuum-side Delrin® Connector - female	C37-ACS	**1520103**
–	–	Female crimps pack 25	CPIN-FC-23	**1520002**

Accessory type	Length ins **mm**	Reference	Part number
Vacuum-side connector and cable assembly	19" **482**	C37-VACCAB19	**1520131**
Air-side connector and cable assembly	96" **2438**	C37-AIRCAB96	**1520130**

All dimensions are nominal in millimetres unless specified.

Subminiature-C
60 pins

CF

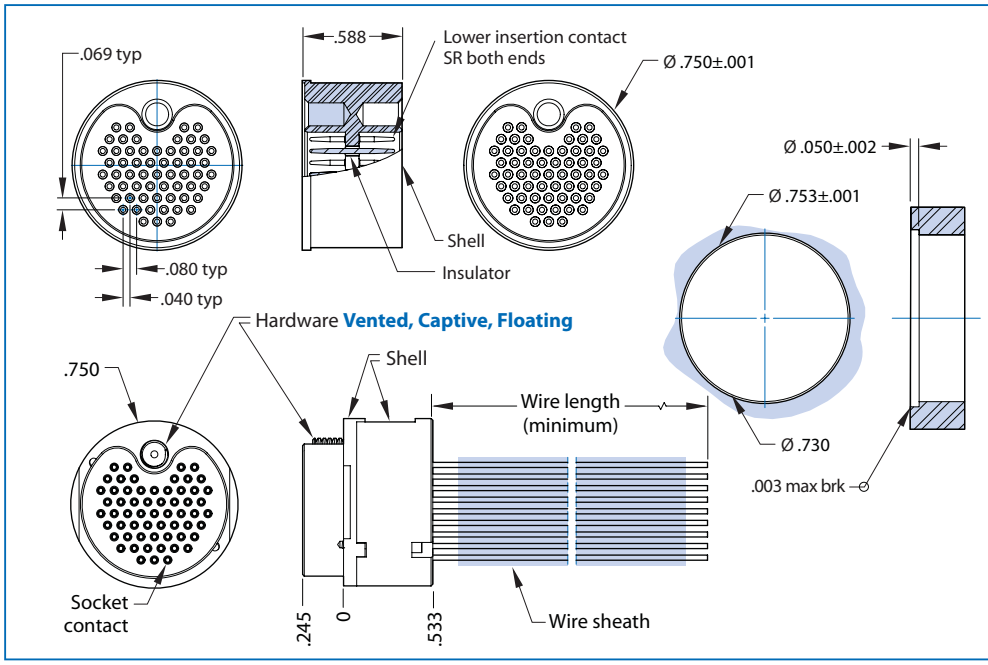


No. of pins	Flange	Description	Reference	Part number
60	DN40CF	Feedthrough, vacuum cable and air-side connector kit [1]	C60KIT-C40	1520200
60	DN40CF	Feedthrough only [2]	C60-C40	1520210

[1] Contains air and vacuum-side connectors with 96 inch **2438mm** and 19 inch **482mm** cable lengths respectively.

[2] This is the stand-alone feedthrough and does not include air or vacuum-side connectors.

Note 23, 37 and 60 pin vacuum connectors include a set of crimp connectors – 9 pin do not.



KF

No. of pins	Flange	Description	Reference	Part number
60	KF40	Feedthrough, vacuum cable and air-side connector kit [1]	C60KIT-K40	1520201
60	KF40	Feedthrough only [2]	C60-K40	1520211

[1] Contains air and vacuum-side connectors with 96 inch **2438mm** and 19 inch **482mm** cable lengths respectively.

[2] This is the stand-alone feedthrough and does not include air or vacuum-side connectors.

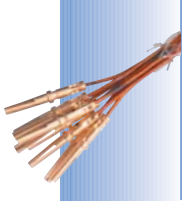
Note 23, 37 and 60 pin vacuum connectors include a set of crimp connectors – 9 pin do not.

Accessories

No. of pins	Flange	Description	Reference	Part number
60	–	Air-side UHV Vacuum PEEK® Connector - female	C60-VCS	1520204
60	–	Vacuum-side Delrin® Connector - female	C60-ACS	1520203
–	–	Female crimps pack 25	CPIN-FC-23	1520002

Accessory type	Length ins **mm**	Reference	Part number
Vacuum-side connector and cable assembly	19″ **482**	C60-VACCAB19	1520231
Air-side connector and cable assembly	96″ **2438**	C60-AIRCAB96	1520230

All dimensions are nominal in millimetres unless specified.



Subminiature-C

Air-UHV Multipin accessories 9 pin

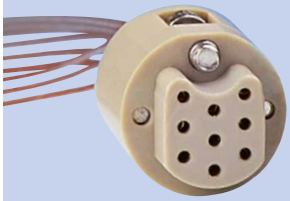
Air Female cable assembly C9-A48S

Air-service **cable assemblies**

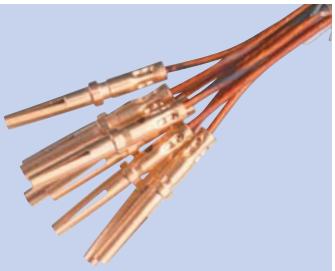
No. of cables	Cable length	Connect	Connect OD	Connector length	Wire diameter	Reference	Part number
Connector fitted							
9	1200	Female	16	19	7 x 0.2	C9-A48S	**1512620**
9	2500	Female	16	19	7 x 0.2	C9-A96S	**1512621**

Each cable assembly is fitted with a Delrin® Subminiature-C female connector. This connector mates directly onto the air-side of a 9 pin Subminiature-C feedthrough.

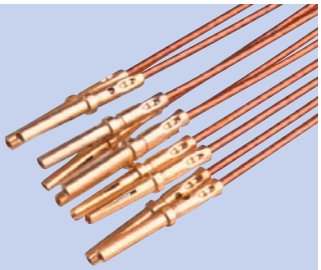
UHV Male cable assembly C 9C-V19P



UHV Female cable assembly C 9C-V19S



UHV Cable with female contacts C9C-V19CS



UHV Leads (10 leads per pack) with female contacts C10L-V19S

UHV **Cable assemblies** Kapton® insulated

No. of cables	Cable length	Connect	Connect OD	Connector length	Wire diameter	Reference	Part number
Connector fitted cable [1]							
9	500	Male	16	13	7 x 0.102	C9C-V19P	**1512623**
9	1000	Male	16	13	7 x 0.102	C9C-V39P	**1512624**
9	500	Female	16	19	7 x 0.102	C9C-V19S	**1512625**
9	1000	Female	16	19	7 x 0.102	C9C-V39S	**1512626**
Contact fitted cable [2]							
9	500	Male	-	-	7 x 0.102	C9C-V19CP	**1512627**
9	1000	Male	-	-	7 x 0.102	C9C-V39CP	**1512628**
9	500	Female	-	-	7 x 0.102	C9C-V19CS	**1512629**
9	1000	Female	-	-	7 x 0.102	C9C-V39CS	**1512630**
Contact fitted leads [3]							
10	500	Male	-	-	7 x 0.785	C10L-V19P	**1512631**
10	1000	Male	-	-	7 x 0.785	C10L-V39P	**1512632**
10	500	Female	-	-	7 x 0.785	C10L-V19S	**1512633**
10	1000	Female	-	-	7 x 0.785	C10L-V39S	**1512634**

[1] Each cable assembly is fitted with a PEEK® Subminiature-C male or female connector. The female connector mates directly onto the vacuum-side of a 9 pin Subminiature-C feedthrough.

[2] **Caution – these cable assemblies do not include the PEEK® connector and they will not allow subsequent connector installation. Wires must be threaded through connector back piece before crimping contacts.**

[3] Contact fitted leads are individual wire strands and are not bundled cable. They are ideally suited for vacuum applications with multiple or complex wire routing requirements. These will allow subsequent connector installation.

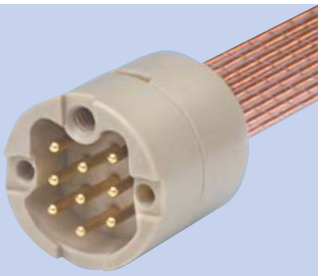
All UHV cable assemblies are bakeable to 260˚C.

UHV connectors are made from PEEK® and wired with Kapton® insulated silver plated copper leads.

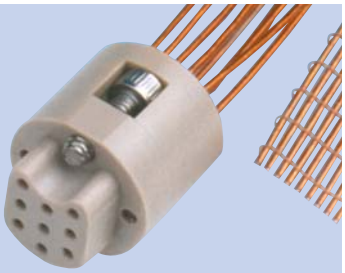
All dimensions are nominal in millimetres unless specified. Weights given are approximate.

Subminiature-C

Air-UHV Multipin accessories 9 pin



UHV Male ribbon assembly C 9R-V19P



UHV Female ribbon assembly C9R-V19S

UHV Ribbon with female contacts C9R-V19CS

UHV Female C9-VCS Connectors

Female contacts DPINFC-10 and crimp tool DCT1

UHV **Ribbon cable assemblies** Kapton® insulated

No. of cables	Cable length	Connect	Connect OD	Connector length	Wire diameter	Reference	Part number
Connector fitted cable [1]							
9	500	Male	16	13	1	C9R-V19P	**1512636**
9	1000	Male	16	13	1	C9R-V39P	**1512637**
9	500	Female	16	19	1	C9R-V19S	**1512638**
9	1000	Female	16	19	1	C9R-V39S	**1512639**
Connector fitted cable [2]							
9	500	Male	16	13	1	C9R-V19CP	**1512640**
9	1000	Male	16	13	1	C9R-V39CP	**1512641**
9	500	Female	16	19	1	C9R-V19CS	**1512642**
9	1000	Female	16	19	1	C9R-V39CS	**1512643**

[1] Each cable assembly is fitted with a PEEK® Subminiature-C male or female connector. The female connector mates directly onto the vacuum-side of a 9 pin Subminiature-C feedthrough.

[2] **Caution – these cable assemblies do not include the PEEK® connector and they will not allow subsequent connector installation. Wires must be threaded through connector back piece before crimping contacts.**

UHV connectors are made from PEEK® and wired with Kapton® insulated silver plated copper leads.

All UHV cable assemblies are bakeable to 260˚C.

UHV **Ribbon extension cables** Kapton® insulated

Typw	Cable length	Reference	Part number
Connector fitted			
UHV	500	SMCAB-C9UHV-500	**1608021**
UHV	39	SMCAB-C9UHV-1000	**1608023**

[1] Each cable is fitted with male and female 9 way Subminiature-C connectors.

All UHV cable assemblies are bakeable to 260˚C.

Connectors, contacts and crimping tools

No. of pins	Service type	Connector	Connector OD	Connector length	Use Contact	Reference	Part number
Connectors							
9	UHV	Male	16	13	1512606	C9-VP	**1512606**
9	UHV	Female	16	19	1512603	C9-VCS	**1512603**
9	Air	Female	16	19	1510103	C9-ACS	**1512602**
Contacts							
1 pack	UHV/Air	Male contacts		10 pieces per pack		DPINMC-10	**1510103**
1 pack	UHV/Air	Female contacts		10 pieces per pack		DPINFC-10	**1510102**
Crimp tool							
1 pack	UHV/Air	Crimping tool for male and female contacts				DCT-1	**1512056**

Connectors do not include contacts which must be purchased separately.

These connectors and contacts will accept 1mm pin diameters.

Vacuum-side connectors are made of PEEK®.

Air-side connectors are made of Delrin®.

All dimensions are nominal in millimetres unless specified.

Subminiature-D

9, 15, 25 and 50 pins

Custom feedthrough

Hermetic Subminiature-D feedthroughs are high density multipin instrumentation feedthroughs constructed with pin arrangements designed to meet MIL-C-24308 specifications.

9, 15, 25 or 50 gold plated pins are hermetically sealed and electrically insulated in a stainless steel shell using the latest in glass-ceramic bonding technology. High and ultrahigh vacuum cable assemblies with PEEK® connectors and Kapton® insulated ribbon cables are available to meet the rigorous demands of UHV environments.

vacuum-side cable assemblies, stand-alone connectors and other accessories are detailed on pages 12 and 13.

Custom Subminiature-D multipin assemblies with up to 250 pin configurations are routinely fabricated.

Features

- Air-side connectors available
- Vacuum-side connectors available
- Kapton® insulated vacuum cables
- UHV compatible construction
- Conflat® compatible flanges
- ISO KF compatible flanges
- High-temperature rated to 250°C
- Custom versions on request

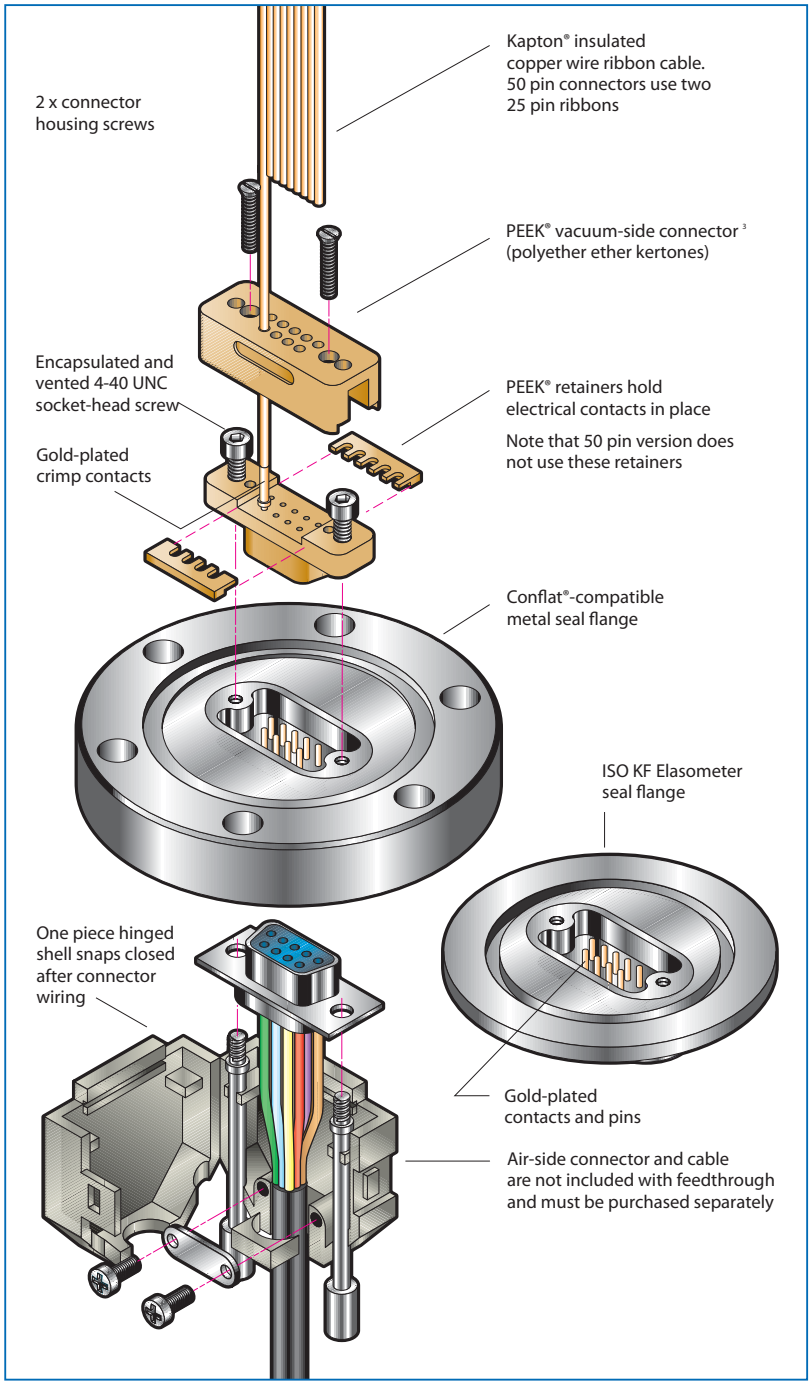
Specifications

Voltage[1]	300V DC maximum
Current	5A maximum at 20°C
Material	
Shell	Stainless steel
Pins	Ni-Fe alloy, gold-plated
Seal/insulation	Glass-ceramic
Connector, air/vacuum[2]	Delrin®/PEEK®
Vacuum range	
UHV/HV	$1x10^{-10}$ mbar/$1x10^{-8}$ mbar
Temperature range[3]	
Del-Seal™ mounted feedthrough	-200°C to 250°C
ISO KF mounted feedthrough	-20°C to 150°C
Air-side connector	55° to 80°C
Vacuum-side connector	-200°C to 250°C
Dimensions Reference only subject to change	

[1] Electrical ratings are maximum test values
Feedthroughs are intended for instrumentation applications carrying low level signal voltages and currents

[2] PEEK® is a Polyether ether ketone thermoplastic

[3] Overall assembly ratings must be adjusted to that of the lowest rated component



All dimensions are nominal in millimetres unless specified.

Subminiature-D
9, 15, 25 and 50 pins

D9-C40
Vacuum-side

D9-C40
Air-side

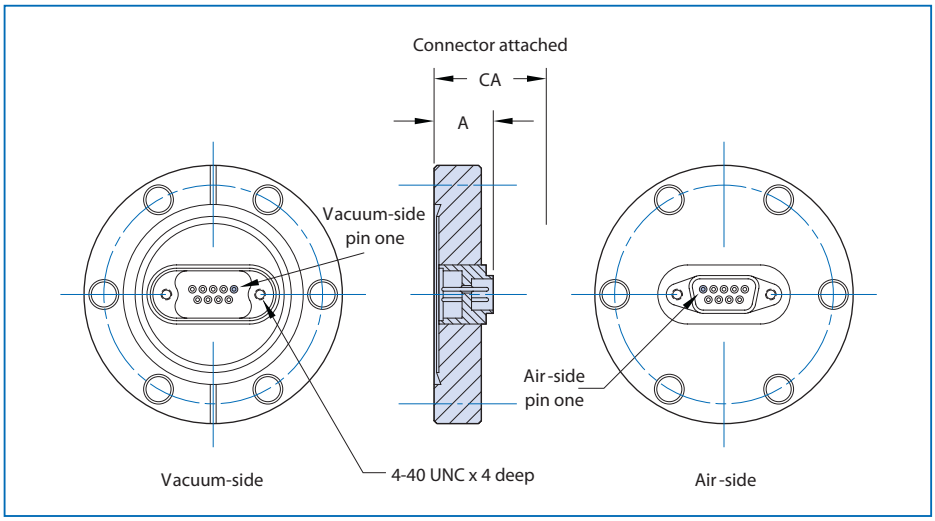
D9-K40

D50-L100

UHV **CF Flange with 9, 15, 25 and 50 pins**

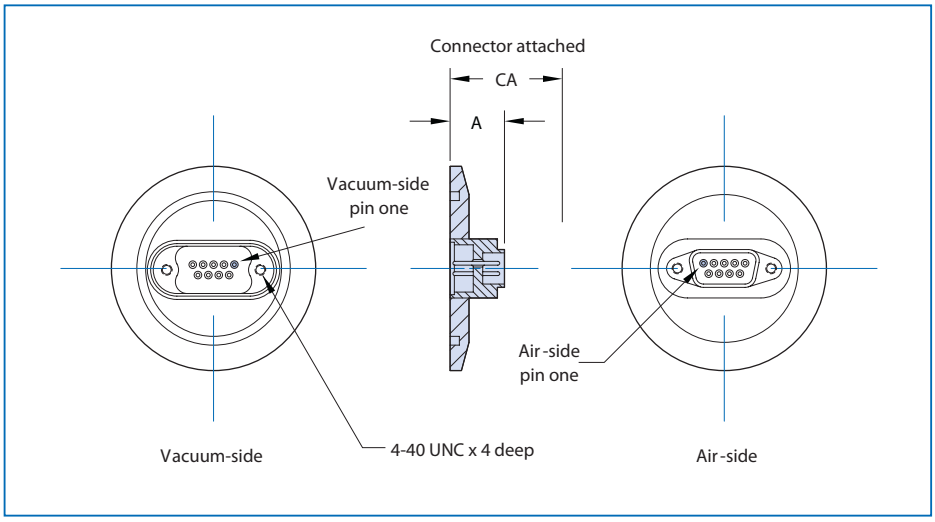
No. of pins	Flange	A	CA	Reference	Part number
9	DN40CF	15	65	D9-C40	**1511000**
15	DN63CF	15	69	D15-C63	**1511001**
25	DN63CF	15	69	D25-C63	**1511002**
50	DN100CF	20	69	D50-C100	**1511007**

Caution – note that air to vacuum pin positions are reversed because of straight-through pin design.



UHV **KF/LF Flange with 9, 15, 25 and 50 pins**

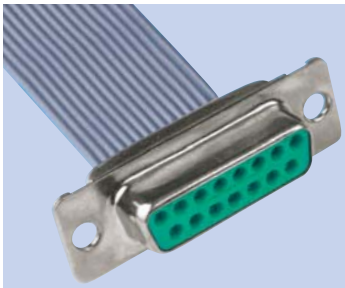
No. of pins	Flange	A	CA	Reference	Part number
9	KF40	15	64	D9-K40	**1511020**
15	ISO63	15	64	D15-L63	**1511021**
25	ISO63	15	64	D25-L63	**1511022**
50	ISO100	15	64	D50-L100	**1511008**



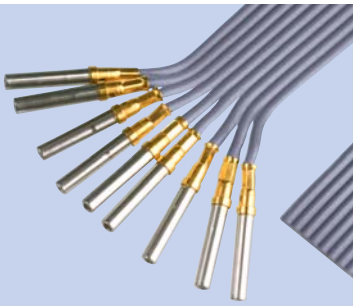
All dimensions are nominal in millimetres unless specified.

Subminiature-D

9, 15, 25 and 50 pins



D15-BCON1-500FC



D9-FPOS-500FP

D15-BCON1M shown with 1510114 contacts

D9-FPOS-500FP

Air-side connector

DPIN-FPOS contacts and DC-POS1 crimp tool

HV **PTFE Ribbon cable assemblies**

No. of wires	Cable length	Connector width	Connector depth	Connector height	Wire diameter	Reference	Part number
Female connector fitted							
9	500	33	19	13	1	D9-BCON1-500FC	**1512660**
9	1000	33	19	13	1	D9-BCON1-1000FC	**1512661**
15	500	42	19	13	1	D15-BCON1-500FC	**1512662**
15	1000	42	19	13	1	D15-BCON1-1000FC	**1512663**
25	500	56	19	13	1	D25-BCON1-500FC	**1512664**
25	1000	56	19	13	1	D25-BCON1-1000FC	**1512665**
50	500	67	19	13	1	D50-BCON1-500FC	**1512666**
50	1000	67	19	13	1	D50-BCON1-1000FC	**1512667**
Female contacts fitted							
9	500	–	–	–	1	D9-FPOS-500FP	**1512668**
9	1000	–	–	–	1	D9-FPOS-1000FP	**1512669**
15	500	–	–	–	1	D15-FPOS-500FP	**1512670**
15	1000	–	–	–	1	D15-FPOS-1000FP	**1512671**
25	500	–	–	–	1	D25-FPOS-500FP	**1512672**
25	1000	–	–	–	1	D25-FPOS-1000FP	**1512673**
50	500	–	–	–	1	D50-FPOS-500FP	**1512674**
50	1000	–	–	–	1	D25-FPOS-1000FB	**1512675**

Each wire is constructed of 7 each 0.3 mm silver plated copper strands.

50 pin cable assemblies are constructed using two 25 pin ribbons.

Maximum temperature rating 105˚C.

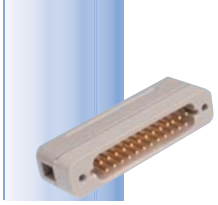
HV **Connectors, contacts and crimping tools**

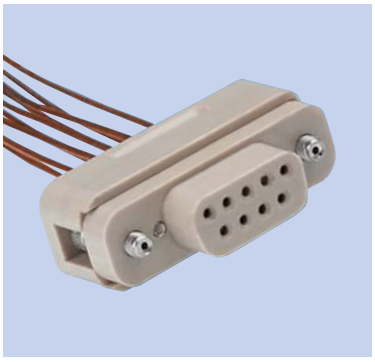
No. of wires	Connector type	Connector width	Connector depth	Connector height	Use Contact	Reference	Part number
High vacuum connectors							
9	Male	33	19	13	1510114	D9-BCON1M	**1510006**
15	Male	42	19	13	1510114	D15-BCON1M	**1510007**
25	Male	56	19	13	1510114	D25-BCON1M	**1510008**
50	Male	67	19	13	151011	D50-BCON1M	**1510009**
9	Female	33	19	13	1510113	D9-BCON1F	**151000**
15	Female	42	19	13	1510113	D15-BCON1F	**151001**
25	Female	56	19	13	1510113	D25-BCON1F	**151002**
50	Female	67	19	13	1510113	D50-BCON1F	**151003**
Air service connectors							
9	Female	33	19	13	Included	D9-AC	**1510990**
15	Female	42	19	13	Included	D15-AC	**1510991**
25	Female	56	19	13	Included	D25-AC	**1510992**
50	Female	67	19	13	Included	D50-AC	**1510993**
1 pack	Contact	Male contacts		25 pieces per package		DPIN-MPOS	**1510114**
1 pack	Contact	Female contacts		25 pieces per package		DPIN-FPOS	**1510113**
1 tool	Crimping tool for male and female contacts					DCT-POS1	**1510115**

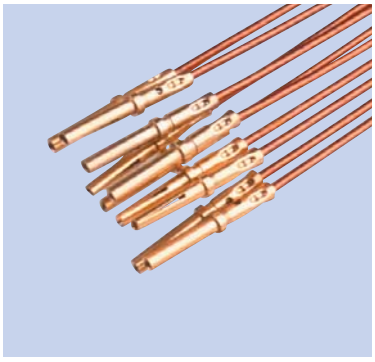
Vacuum connectors do not include contacts which must be purchased separately.
These connectors and contacts will mate with 1 mm pin diameters.
air-side connectors are fitted with solder-cup contacts.

All dimensions are nominal in millimetres unless specified.

Subminiature-D
9, 15, 25 and 50 pins







HV **PTFE Ribbon cable assemblies**

No. of wires	Cable length	Connector width	Connector depth	Connector height	Wire diameter	Reference	Part number
Female connector fitted							
9	500	33	19	13	1	KAP-R9-500FC	**1512350**
9	1000	33	19	13	1	KAP-R9-1000FC	**1512354**
15	500	42	19	13	1	KAP-R15-500FC	**1512351**
15	1000	42	19	13	1	KAP-R15-1000FC	**1512355**
25	500	56	19	13	1	KAP-R25-500FC	**1512352**
25	1000	56	19	13	1	KAP-R25-1000FC	**1512356**
50	500	67	19	13	1	KAP-R50-500FC	**1512357**
50	1000	67	19	13	1	KAP-R50-1000FC	**1512358**
Male contact fitted [1]							
9	500	–	–	–	1	KAP-R9-500FP	**1512301**
9	1000	–	–	–	1	KAP-R9-1000FP	**1512310**
15	500	–	–	–	1	KAP-R15-500FP	**1512302**
15	1000	–	–	–	1	KAP-R15-1000FP	**1512311**
25	500	–	–	–	1	KAP-R25-500FP	**1512303**
25	1000	–	–	–	1	KAP-R25-1000FP	**1512312**

Each wire is constructed of 7 each 0.005inch 13mm silver plated copper strands.

50 pin cable assemblies are constructed using two 25 pin ribbons.

All UHV cable assemblies are bakeable to 260˚C.

[1] **Caution! These cable assemblies do not include the PEEK® connector and they will not allow subsequent connector installation. Wires must be threaded through connector back piece before crimping contacts.**

HV **Connectors, contacts and crimping tools**

No. of wires	Connector type	Connector width	Connector depth	Connector height	Use Contact	Reference	Part number
9	Male	33	19	13	1510101	D9-BCON2M	**1510020**
15	Male	42	19	13	1510101	D15-BCON2M	**1510021**
25	Male	56	19	13	1510101	D25-BCON2M	**1510022**
50	Male	67	19	13	1510101	D50-BCON2M	**1510023**
9	Female	33	19	13	1510100	D9-BCON2F	**1510010**
15	Female	42	19	13	1510100	D15-BCON2F	**1510011**
25	Female	56	19	13	1510100	D25-BCON2F	**1510012**
50	Female	67	19	13	1510100	D50-BCON2F	**1510013**
1 pack	Contact	Male contacts		25 pieces per package		DPINMC	**1510101**
1 pack	Contact	Female contacts		25 pieces per package		DPINFC	**1510100**
1 tool	Crimping tool for male and female contacts					DCT1	**1512056**

Connectors do not include contacts which must be purchased separately.
These connectors and contacts will mate with 0.04 inches**1 mm** pin diameters.

All dimensions are nominal in millimetres unless specified.

Power Subminiature-D

3, 5 and 8 pins

Complete air-to-vacuum instrumentation connectivity

Features

- 3, 5 and 8 pins available
- UHV compatible materials
- UHV temperature rated 350°C
- Meets MIL-DTL-24308
- Air-side connectors included
- Vacuum-side connectors available
- Custom feedthough configurations available on request

Specifications

Voltage / Current ratings	
3 pin	1000VDC/40A (102A max.)
5 pin	1000VDC/40A (170A max.)
8 pin	1000VDC/40A (270A max.)
Material	
Shell	Stainless steel 304
Pins	BeCu gold plated
Seal/Insulation	Ceramax
Connector	
Vacuum	PEEK® [1]
Vacuum range	
UHV (CF)	1 x10^{-10} mbar
HV (KF)	1 x10^{-8} mbar
Temperature range [2]	
Feedthrough – CF	-200°C to +250°C
Feedthrough – KF	-20°C to +160°C
Connector – Air	200°C to +60°C
Connector – Vacuum	-200°C to +250°C
Thermal gradient	25°C per minute max.

[1] PEEK® is a Polyether-Etherketone thermoplastic.

[2] Overall assembly ratings must be adjusted to that of the lowest rated component.

UHV and HV series

CF Mount

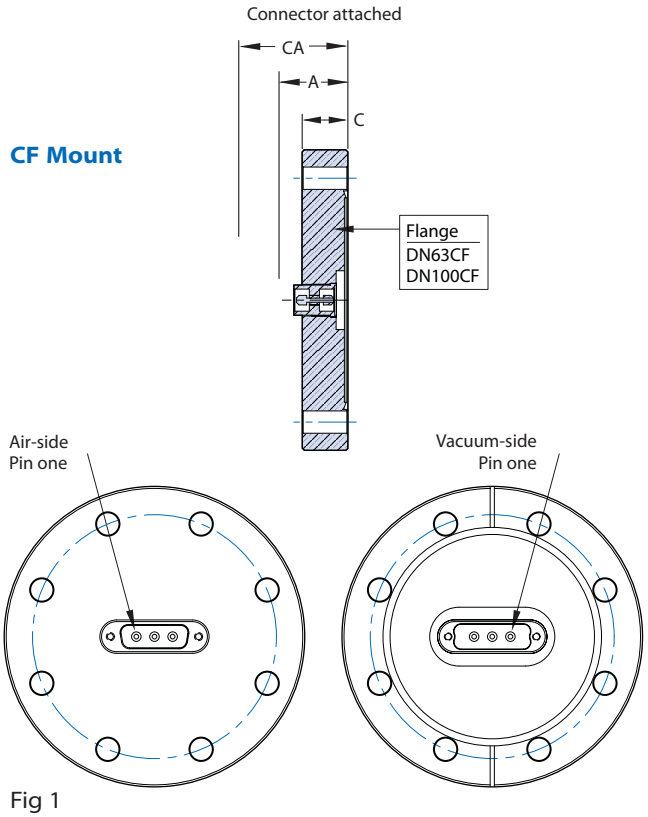


Fig 1

End views Air and vacuum-side

ISO KF Mount

* Cross-sections for ISO63 flange are not shown. Reference MDC claw-clamp style Large-Flange

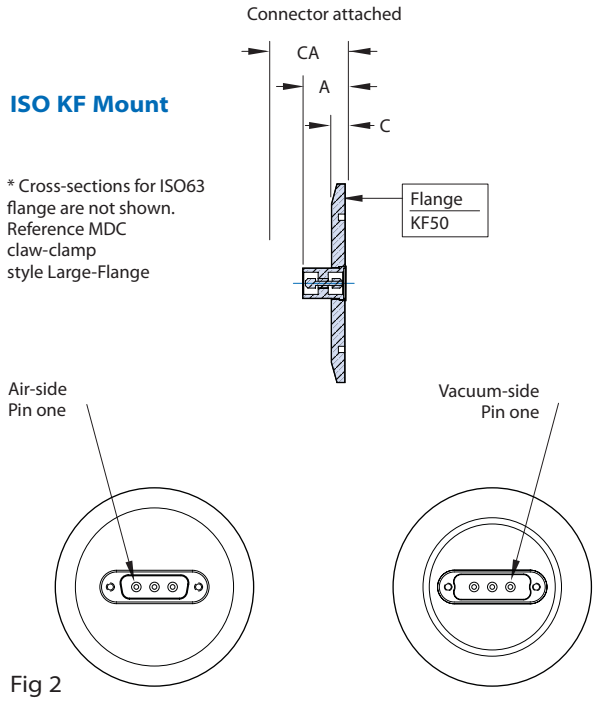


Fig 2

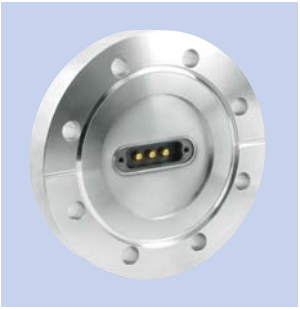
End views Air and vacuum-side

All dimensions are nominal in millimetres unless specified.

Power Subminiature-D

3, 5 and 8 pins

CF



No. of pins	CF Flange	Fig.	Dim A	Dim C	Dim CA	Reference	Part number
3	DN63CF	1	17.5	20.3	70	PD3-C63	**9132020**
5	DN63CF	1	17.5	20.3	70	PD5-C63	**9132021**
8	DN100CF	1	19.8	221.1	70	PD8-C100	**9132022**

ISO KF/LF

No. of pins	KF/LF Flange	Fig.	Dim A	Dim C	Dim CA	Reference	Part number
3	KF50	2	16	5	65	PD3-K50	**9133020**
5	ISO63	-	16	12	65	PD5-L63	**9133021**
8	ISO100	-	16	12	65	PD8-L100	**9133022**

Accessories

Accessory type	Conductor No. of pins	Reference	Part number
Air-side connector	3	PD3-AIRCON	**9924090**
Air-side connector	5	PD5-AIRCON	**9924092**
Air-side connector	8	PD8-AIRCON	**9924094**
Vacuum-side PEEK® Connector	3	PD3-VACCON	**9924091**
Vacuum-side PEEK® Connector	5	PD5-VACCON	**9924093**
Vacuum-side PEEK® Connector	8	PD8-VACCON	**9924095**
Vacuum contacts	5 pack	DDPIN-FC	**9923049**

No. of pins	Type	Description	Lead length	Reference	Part number
3	UHV	Connector with lead	609	PD3-VACCAB-24	**1517000**
5	UHV	Connector with lead	609	PD5-VACCAB-24	**1517001**
8	UHV	Connector with lead	609	PD8-VACCAB-24	**1517002**

All dimensions are nominal in millimetres unless specified.

Double Density
Subminiature-D

Complete air-to-vacuum instrumentation connectivity

Features

- UHV compatible materials
- Meets MIL-DTL-24308
- Gold plated pins
- 'Double density' v Standard Sub-Ds
- Air-side connectors included
- Vacuum and air-side connectors available
- Custom feedthough configurations available on request

Specifications

Voltage	1000 VDC maximum [1]
Current	10 Amperes maximum at 20°C
Per pin amperage	10 Amps per pin [1]
Shell	Stainless Steel
Pins	BeCu gold plated
Seal/Insulation	Ceramic/PEEK® [2]
Vacuum range	
UHV (CF)	1 x10^{-10} mbar
HV (KF)	1 x10^{-8} mbar
Temperature range [2]	-200°C to +250°C
Air-side connector	-55°C to +80°C
Vacuum -side connector	-200°C to +250°C
Thermal gradient	25°C per minute max.

[1] Electrical ratings are maximum test values. Feedthroughs are intended for instrumentation applications carrying low level signal voltages and currents. Current ratings shown are maximum per pin (and maximum per feedthrough.

[2] PEEK® is a Polyether-Etherketone thermoplastic.

[3] Overall assembly ratings must be adjusted to that of the lowest rated component.

UHV and HV series

CF Mount

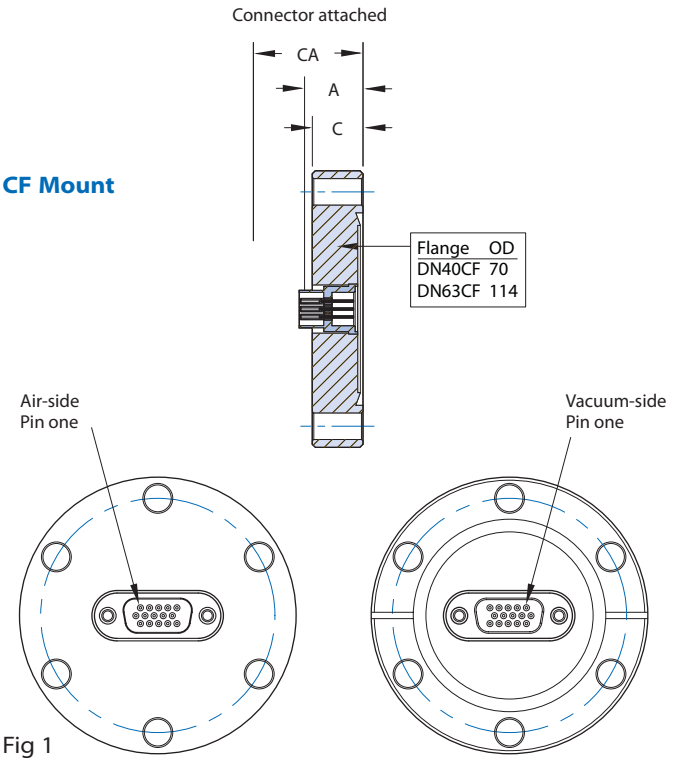
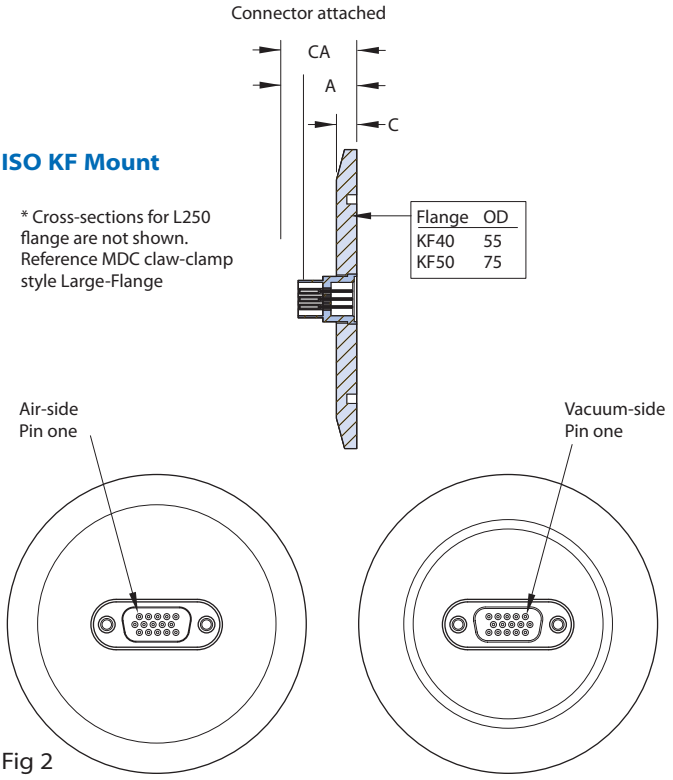


Fig 1

End views Air and vacuum-side

ISO KF Mount



* Cross-sections for L250 flange are not shown. Reference MDC claw-clamp style Large-Flange

Fig 2

End views Air and vacuum-side

All dimensions are nominal in millimetres unless specified.

Double Density
Subminiature-D

CF

No. of pins	CF Flange	Fig.	Dim A	Dim C	Dim CA	Reference	Part number
15	DN40CF	1	.63	.50	.88	DD15-C40	**9162006**
26	DN63CF	1	.69	.68	.93	DD26-C63	**9162007**
44	DN63CF	1	.69	.68	.93	DD44-C63	**9162008**

ISO KF/LF

No. of pins	KF/ISO Flange	Fig.	Dim A	Dim C	Dim CA	Reference	Part number
15	KF40	2	.58	.20	.88	DD15-K40	**9163006**
26	KF50	2	.58	.20	.88	DD26-K50	**9163007**
44	ISO63	-	.58	.20	.88	DD44-L63	**9163008**

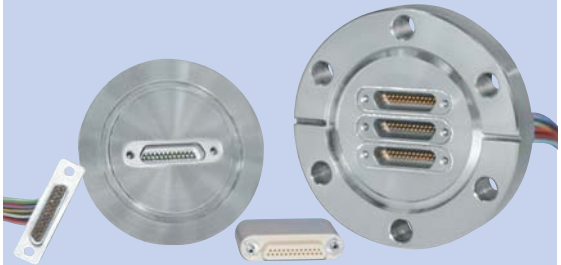
Accessories

No. of pins	Accessory type	Length inches mm	Reference	Part number
15	Air-side cable kit	24" **609**	DD15-AIRCAB-24	**9921028**
26	Air-side cable kit	24" **609**	DD26-AIRCAB-24	**9921029**
44	Air-side cable kit	24" **609**	DD44-AIRCAB-24	**9921030**
15	Vacuum-side cable kit	24" **609**	DD15-VACCAB-24	**9921036**
26	Vacuum-side cable kit	24" **609**	DD26-VACCAB-24	**9921037**
44	Vacuum-side cable kit	24" **609**	DD44-VACCAB-24	**9921038**
-	Vacuum contacts	15 pack	DDPIN-FC	**1520300**

All dimensions are nominal in millimetres unless specified.

Micro-D Instrumentation

9, 15, 25, 51 and 100 pins



Complete air-to-vacuum instrumentation connectivity

Features

- UHV compatible materials
- Ultra compact design
- UHV Temperature rated to 350°C
- MIL-DTL-24308
- Kapton® insulated UHV Ribbon cable
- Vacuum and air-side connectors available
- Two standard vacuum mounting styles
- Custom feedthough configurations available on request

Specifications

Voltage	300V DC maximum
Current [1]	3A max per pin
Material	
Shell	Stainless Steel
Pins	BeCu gold plated
Seal/Insulation	Ceramic
Connector	
Vacuum	PEEK® [2]
Vacuum range	
UHV (CF)	1 x10^{-10} mbar
HV (KF)	1 x10^{-8} mbar
Temperature range [3]	
UHV (CF)	-200°C to +250°C
HV (KF)	-20°C to +160°C
Air-side connector	-55°C to +80°C
Vacuum -side connector	-200°C to +250°C
Thermal gradient	25°C per minute max.

[1] Electrical ratings are maximum test values. Feedthroughs are intended for instrumentation applications carrying low level signal voltages and currents. Current ratings shown are maximum per pin (and maximum per feedthrough.

[2] PEEK® is a Polyether-Etherketone thermoplastic.

[3] Overall assembly ratings must be adjusted to that of the lowest rated component.

UHV and HV series

CF Mount

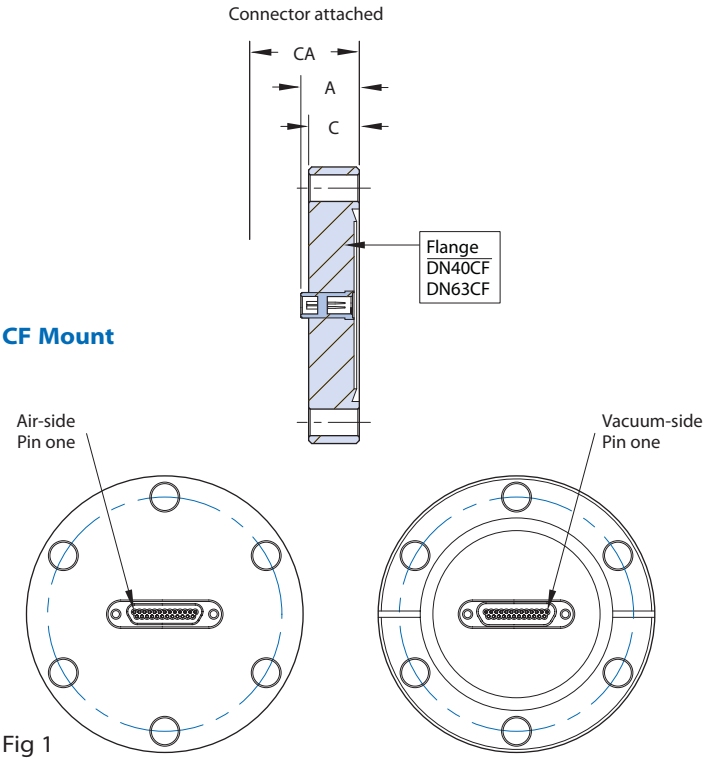


Fig 1

End views Air and vacuum-side

ISO KF Mount

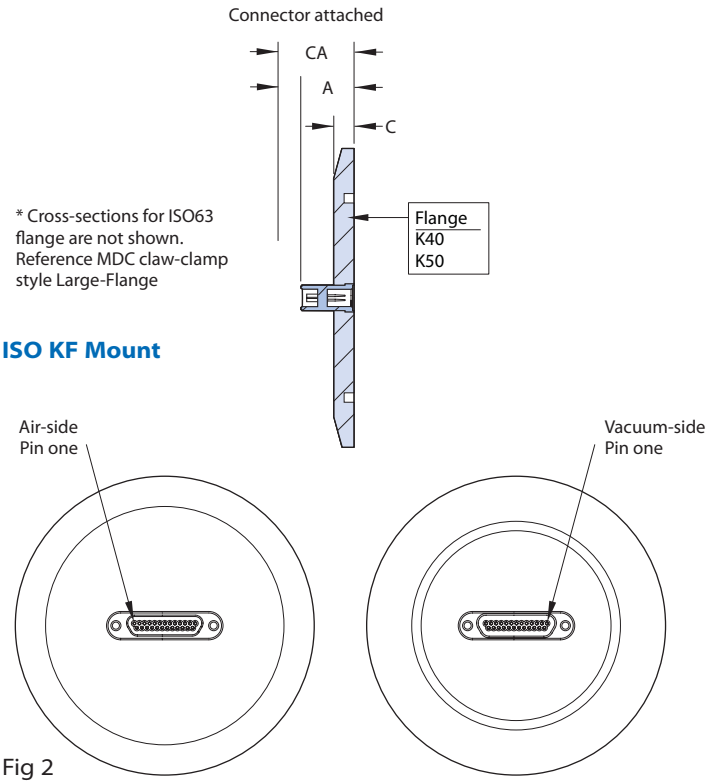


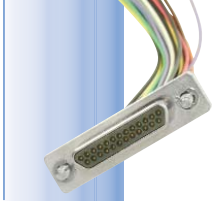
Fig 2

End views Air and vacuum-side

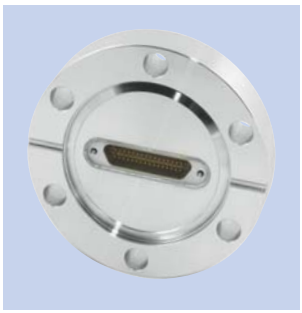
All dimensions are nominal in millimetres unless specified.

Micro-D Instrumentation

9, 15, 25, 51 and 100 pins

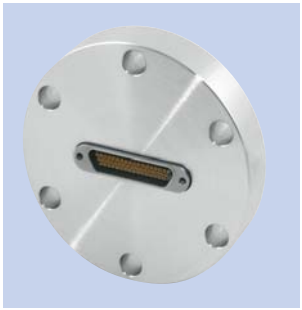


CF



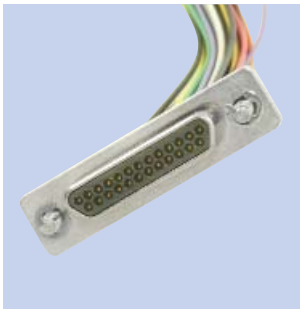
No. of pins	CF Flange	Fig.	Dim A	Dim C	Dim CA	Reference	Part number
9	DN40CF	1	14.7	12.7	20.5	MD9-C40	**9162001**
15	DN40CF	1	14.7	12.7	20.5	MD15-C40	**9162002**
25	DN40CF	1	14.7	12.7	20.5	MD25-C40	**9162003**
51	DN40CF	1	14.7	12.7	20.5	MD51-C40	**9162004**
100	DN63CF	1	17.5	17.4	23.6	MD100-C63	**9162005**

ISO KF/LF



No. of pins	KF/LF Flange	Fig.	Dim A	Dim C	Dim CA	Reference	Part number
9	KF40	2	13.5	5	19.1	MD9-K40	**9163001**
15	KF40	2	13.5	5	19.1	MD15-K40	**9163002**
25	KF40	2	13.5	5	19.1	MD25-K40	**9163003**
51	KF40	2	13.5	5	19.1	MD51-K40	**9163004**
100	ISO63	2	13.5	12	19.1	MD100-L63	**9163005**

Accessories – air + side connector kits



Accessory type	No. of Wires	Length mm	Reference	Part number
Air-side cable kit	9	609	MD9-AIRCAB24	**9921023**
Air-side cable kit	15	609	MD15-AIRCAB24	**9921024**
Air-side cable kit	25	609	MD25-AIRCAB24	**9921025**
Air-side cable kit	51	609	MD51-AIRCAB24	**9921026**
Air-side cable kit	100	609	MD100-AIRCAB24	**9921027**
Vacuum-side PEEK® cable kit [1]	9	609	MD9-VACCAB24	**9921031**
Vacuum-side PEEK® cable kit [1]	15	609	MD15-VACCAB24	**9921032**
Vacuum-side PEEK® cable kit [1]	25	609	MD25-VACCAB24	**9921033**
Vacuum-side PEEK® cable kit [1]	51	609	MD51-VACCAB24	**9921034**
Vacuum-side PEEK® cable kit [1]	100	609	MD100-VACCAB24	**9921035**

[1] The above vacuum connector is an MDC custom part, designed to fit our Micro-D configuration – we recommend feedthrough and connector are purchased together.

All dimensions are nominal in millimetres unless specified.

USB Instrumentation

4 pins

Complete air-to-vacuum instrumentation connectivity

Features

- USB 2.0 Series A Reptacle
- UHV Compatible construction
- Conflat® and KF Mounting flanges as standard
- High temperature range to: -200°C to +200°C maximum
- Vacuum cables available
- Custom feedthough configurations available on request

Specifications

Voltage	Instrumentation
Material	
Shell	Stainless Steel 304
Pins	BeCu gold plated
Seal/Insulation	Ceramic/PBT
Connector	
Vacuum	SS/PEEK® [1]
Vacuum range	
UHV (CF)	1 x10^{-10} mbar
HV (KF)	1 x10^{-8} mbar
Temperature range	
Feedthrough – CF	-200°C to +160°C
Feedthrough – KF	-20°C to +160°C
Connector vacuum	-200°C to +250°C

[1] PEEK® is a Polyether-Etherketone thermoplastic.

UHV and HV series

CF Mount

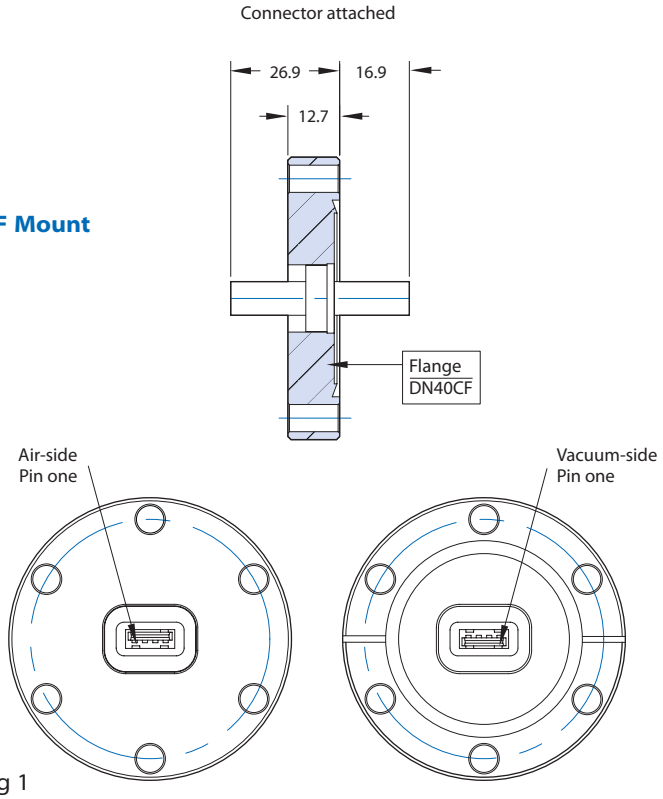


Fig 1

End views Air and vacuum-side

ISO KF Mount

* Cross-sections for ISO63 flange are not shown. Reference MDC claw-clamp style Large-Flange

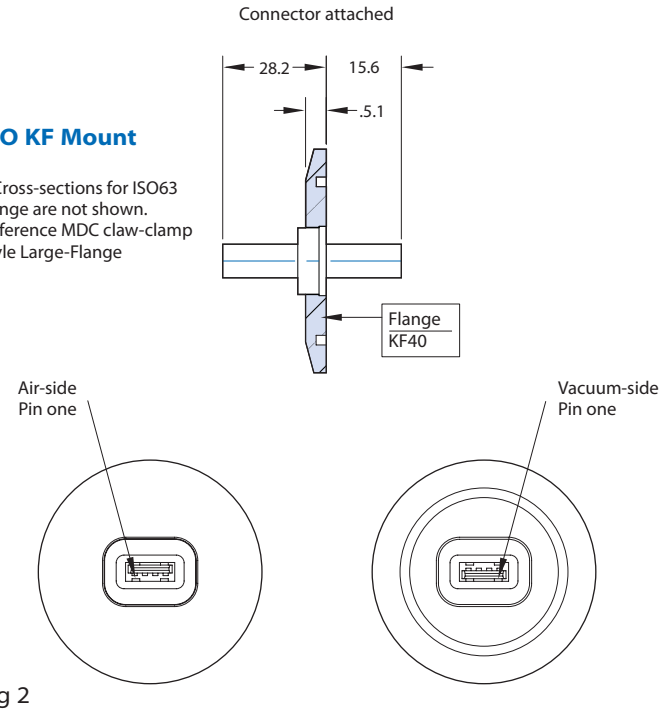


Fig 2

End views Air and vacuum-side

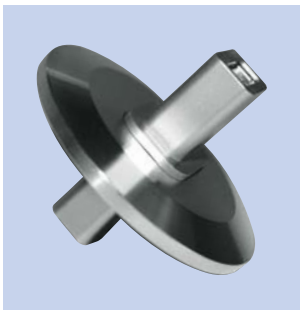
All dimensions are nominal in millimetres unless specified.

USB Instrumentation
4 pins

CF

Number of pins	Flange	Description	Reference	Part number
4	DN40CF	USB 2.0 Feedthrough	USB-C40	**9172001**

ISO KF



Number of pins	Flange	Description	Reference	Part number
4	KF40	USB 2.0 Feedthrough	USB-K40	**9173001**

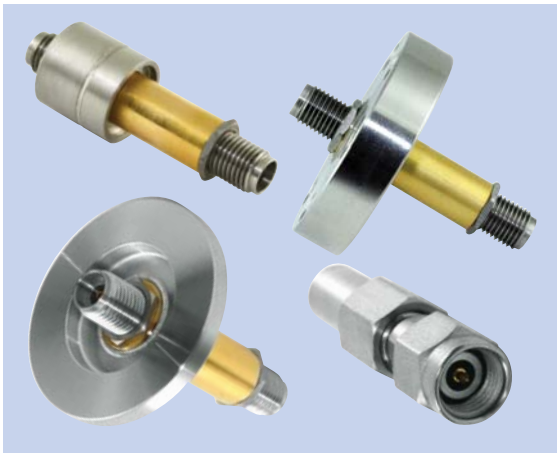
Accessories

Accessory type	Length	Reference	Part number
UHV USB 2.00 Vacuum connector with lead	609	USB-VACCAB-24	**1516000**
UHV USB 2.00 Vacuum connector with lead	914	USB-VACCAB-36	**1516001**
UHV USB 2.00 Vacuum connector with lead	1219	USB-VACCAB-48	**1516002**

All dimensions are nominal in millimetres unless specified.

SMA Coaxial

High frequency 45 GHz



Features

- High frequency signal transmission to 45GHz
- Nominal impedance 50Ω
- Grounded and floating shields versions
- UHV compatible construction
- Conflat® and KF mounting flanges as standard
- High temperature range: -200°C to +250°C maximum
- Air-side connectors available

Specifications

Voltage / Current ratings [1]	300V / 3A
Material	
Shell	Stainless Steel
Pins	Stainless Steel
Seal / Insulation	Aluminium Oxide
Vacuum range	
UHV (CF)	1 x10^{-9}mbar
HV (KF)	1 x10^{-8}mbar
Temperature range [2]	
Feedthrough – CF	-200°C to +250°C
Feedthrough – KF	-20°C to +160°C
Thermal gradient	25°C per minute max.
Uses [3]	2.92mm SMA Interface

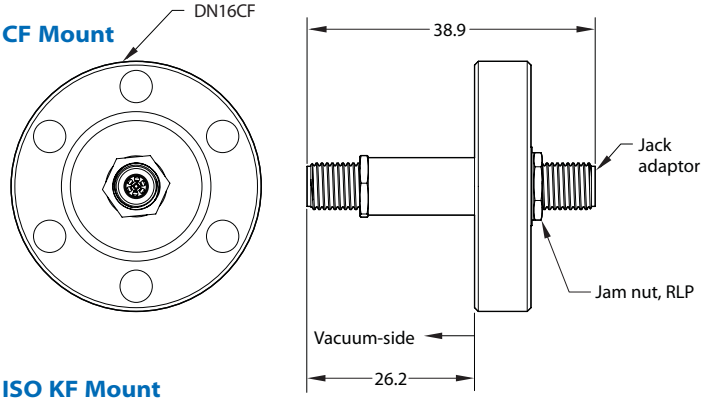
[1] Electrical ratings are maximum test values. Feedthroughs are intended for instrumentation applications carrying low level signal voltages and currents. Current ratings shown are maximum per pin (and maximum per feedthrough.

[2] Overall assembly ratings must be adjusted to that of the lowest rated component.

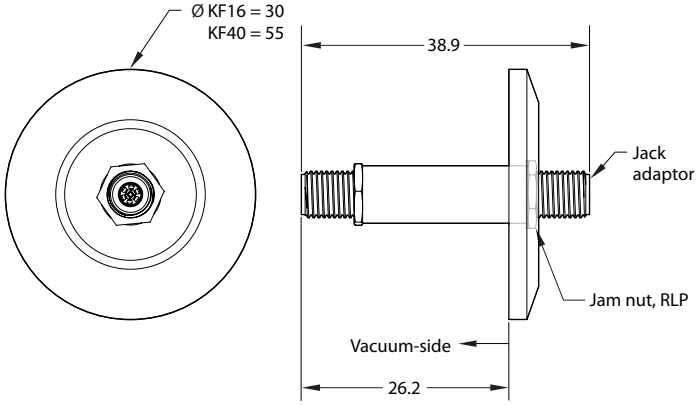
[3] Air-side connectors are not included with feedthroughs.

UHV and HV series

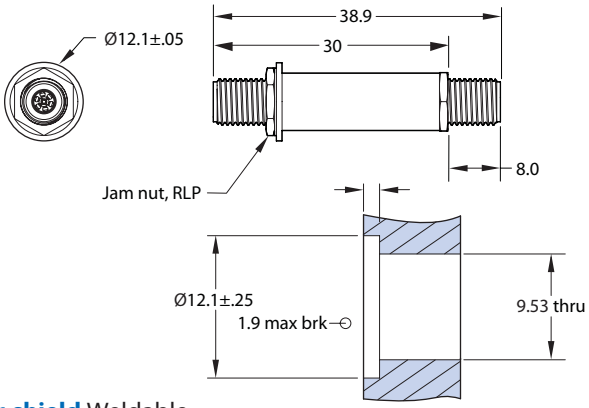
CF Mount



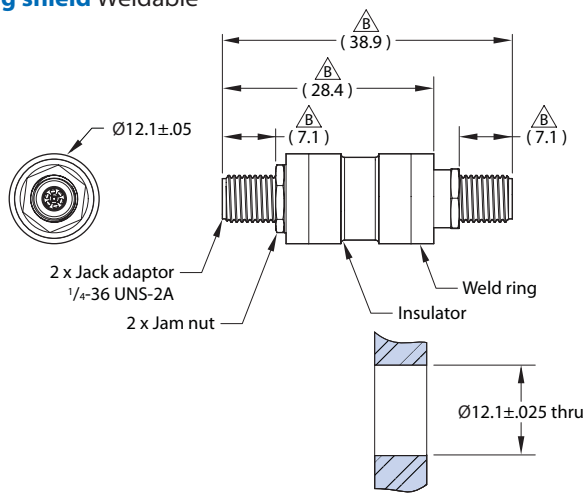
ISO KF Mount



Weldable Grounded shield



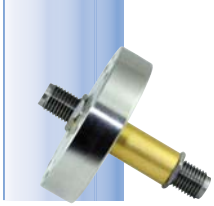
Floating shield Weldable



All dimensions are nominal in millimetres unless specified.

SMA Coaxial

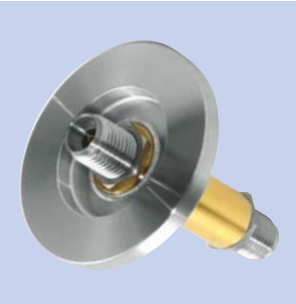
High frequency 45 GHz



CF

No. of pins	CF Flange	Description	Reference	Part number
1	DN16CF	Double ended, floating shield, flange mounted	SMA45-FS-C16	**1518000**
1	DN16CF	Double ended, grounded shield, flange mounted	SMA45-GS-C16	**1518001**

ISO KF



No. of pins	CF Flange	Description	Reference	Part number
1	KF16	Double ended, floating shield, flange mounted	SMA45-FS-K16	**1518002**
1	KF40	Double ended, grounded shield, flange mounted	SMA45-GS-K40	**1518003**

Weldable

Mount type	Reference	Part number
Double ended	SMA45-WELD	**1518004**

Connectors

Description	Reference	Part number
Air-side connector	SMA45-CON	**1518005**

NB Air-side connectors are not included with feedthroughs.

All dimensions are nominal in millimetres unless specified.

Tri-ax

Description

This MDC feedthrough is true tri-axial, all three contact points are electrically isolated from one another. All ceramic construction without any glass in a very low profile design, which allows it to be mounted on both KF16 and DN16CF flanges upwards.

Features

- Double ended connection construction
- Rated 400V RMS, 5A max current
- Gold plated BeCu central conductor
- UHV Compatible construction
- Conflat® and KF mounting flanges as standard
- High temperature range: -200°C to +250°C maximum
- Air and vacuum connectors available
- Grounded and floating shields versions
- Connector conforms to MIL-C-49142
- Interface conforms to MIL-STD-348
- Available on DN16CF, DN40CF, KF16 and KF40

Specifications

Voltage / Current ratings [1]	
Material	
Shell	Stainless Steel 304
Pins	Ni/Gold plated BeCu
Seal/Insulation	Aluminium Oxide/PEEK®
Connector	
Air	DELRIN®
Vacuum	PEEK® [2]
Vacuum range	
UHV (CF)	1 x10⁻⁹mbar
HV (KF)	1 x10⁻⁸ mbar
Temperature range [3]	
Feedthrough – CF	-200°C to +250°C
Feedthrough – KF	-20°C to +160°C
Thermal gradient	25°C per minute max.

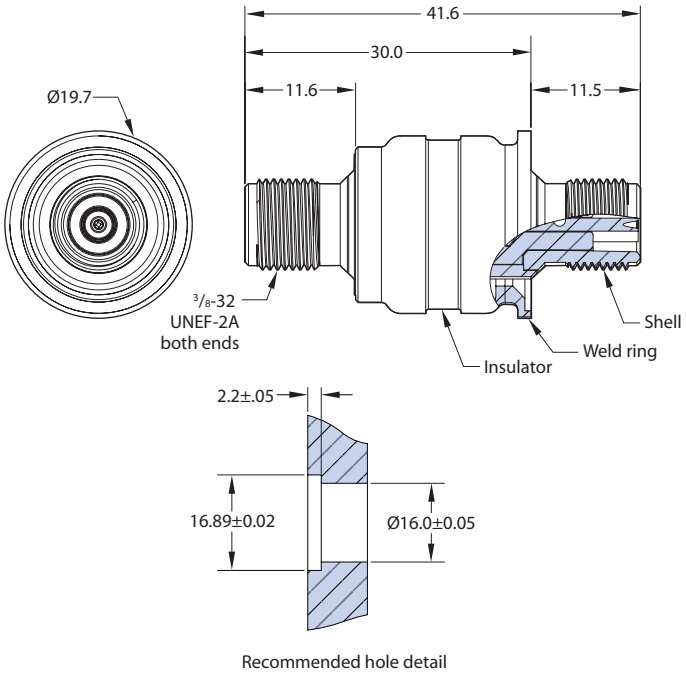
[1] Electrical ratings are maximum test values. Feedthroughs are intended for instrumentation applications carrying low level signal voltages and currents. Current ratings shown are maximum per pin (and maximum per feedthrough).

[2] PEEK® is a Polyether-Etherketone thermoplastic.

[3] Overall assembly ratings must be adjusted to that of the lowest rated component.

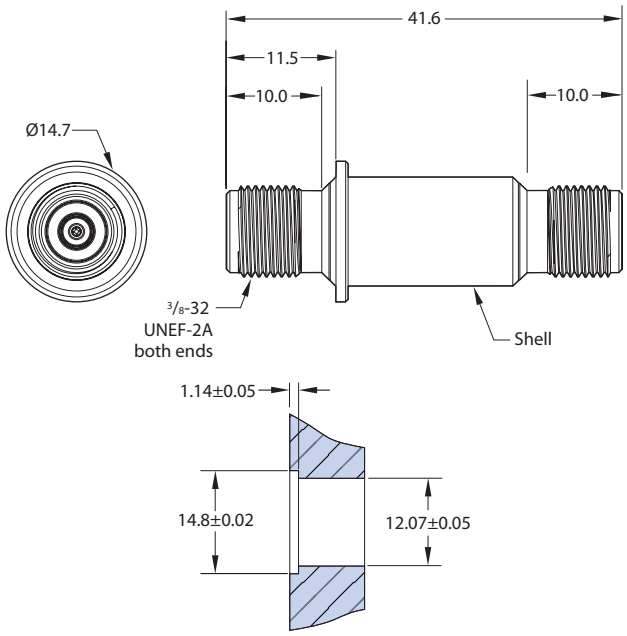
UHV and HV series

Floating shield



Recommended hole detail

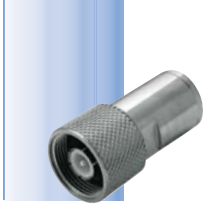
Grounded shield



Recommended hole detail

All dimensions are nominal in millimetres unless specified.

Tri-ax



CF

No. of pins	CF Flange	Description	Reference	Part number
1	DN16CF	Double ended, floating shield, flange mounted	TRIAX-FS-C16	**1519000**
1	DN40CF	Double ended, floating shield, flange mounted	TRIAX-FS-C40	**1519001**
1	DN16CF	Double ended, grounded shield, flange mounted	TRIAX-GS-C16	**1519002**
1	DN40CF	Double ended, grounded shield, flange mounted	TRIAX-GS-C40	**1519003**

Note Connectors not included

ISO KF

No. of pins	CF Flange	Description	Reference	Part number
1	KF16	Double ended, floating shield, flange mounted	TRIAX-FS-K16	**1519004**
1	KF40	Double ended, floating shield, flange mounted	TRIAX-FS-K40	**1519005**
1	KF16	Double ended, grounded shield, flange mounted	TRIAX-GS-K16	**1519006**
1	KF40	Double ended, grounded shield, flange mounted	TRIAX-GS-K40	**1519007**

Note Connectors not included

Weldable

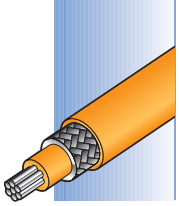
No. of pins	Description	Reference	Part number
1	Double ended, floating shield, weldable	TRIAX-FS-WELD	**1519008**
1	Double ended, groundedshield, weldable	TRIAX-GS-WELD	**1519009**

Note Connectors are not included

Connectors

Description	Reference	Part number
Air-side connector	TRIAX-CON-AIR	**1519010**

All dimensions are nominal in millimetres unless specified.



In-vacuum wiring

Kapton® insulated cable

Features

- High strength Kapton® Type F film
- Silver plated copper conductors
- Single, multi-strand and coaxial
- Cryogenic instrumentation wire
- Type-K Thermocouple wire
- UHV compatible construction
- High temperature rated to 260°C

Specifications

Voltage[1]	See each table
Current	See each table
Materials	
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
Tensile strength	10MPa
Elongation	75%
Moisture absorption	0.4% @ 50% RH
Radiation resistance	10^9 Rads
Vacuum range	
UHV	$1x10^{-11}$mbar
Temperature range[2]	
Conventional	260°C
Cryogenic	-269°C

[1] Electrical ratings are maximum test values.

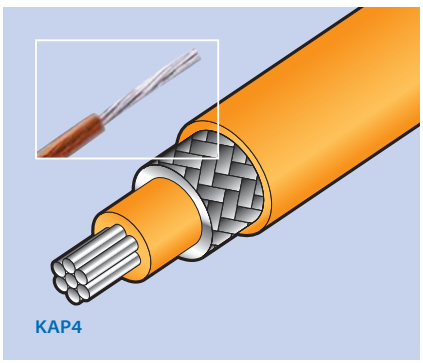
[2] Overall ratings must be adjusted to that of the lowest rated component.

MDC Vacuum Limited's Kapton® insulated in-vacuum wiring is designed for high and ultrahigh vacuum environments up to 260°C. All conductors and braided shields (coaxial cable shields) are silver plated copper wire. Insulation is Kapton® Type-F film that is applied and heat treated to effectively minimise trapped volumes of gas and maintain mechanical strength.

Included in this section are MDC Vacuum's exclusive in-vacuum ribbon cables. These ribbon cables are available in either high or ultrahigh vacuum grades. UHV ribbon cables consist of multiple strands of Kapton® insulated wires that are bundled together with a PEEK® (Polyether-Etherketone) monofilament weaving. MDC Vacuum's ribbon cables are designed to complement its line of Subminiature-C and D feedthroughs. High vacuum PTFE ribbon cable is available as an economical solution for less demanding vacuum applications.

For sensitive UHV instrumentation applications such as AFM (atomic force microscopy) or STM (scanning tunnelling microscopy) requiring minimal loads and maximum flexibility, MDC Vacuum Limited offers standard and cryogenic fine instrumentation wires. The cryogenic instrumentation wire is suitable for temperatures down to -269°C (4°K-Liquid Helium). Securing and fastening these fine instrumentation wires is made simple with the use of conductive in-vacuum adhesives.

Wire strippers and glass-ceramic colour identification beads are some of the accessories offered to facilitate working with MDC Vacuum's extensive selection of in-vacuum wire and cable products.

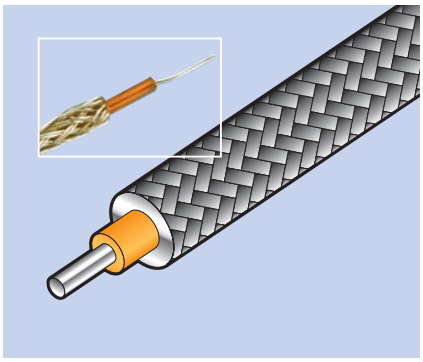


KAP4

UHV **0.61mm diameter coaxial cable**

Cable type	Cable length mm	Jacket diameter	Wire diameter	Reference	Part number
Coaxial	10000	1.47	7 x 0.2	KAP4	**1512005**

Resistance of 87.2Ω/km, a capacitance 300pf/m, a voltage rating of 600VAC, 2kVDC and a current of 4.5A.



UHV **0.25mm diameter coaxial cable**

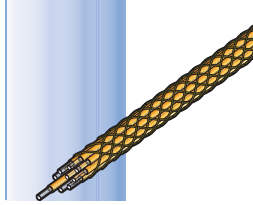
Cable type	Cable length mm	Jacket diameter	Wire diameter	Reference	Part number
Coaxial	10000	0.89	0.25	KAP3	**1512004**

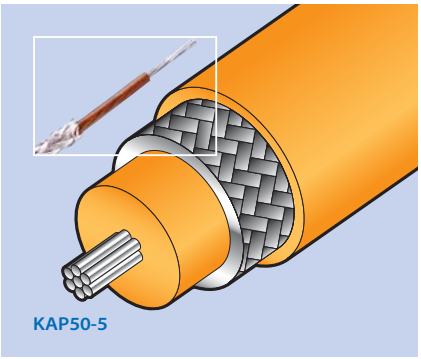
Resistance of 375.8Ω/km, a capacitance 180pf/m, a voltage rating of 600VAC, 2kVDC and a current of 1.5A.

All dimensions are nominal in millimetres unless specified.

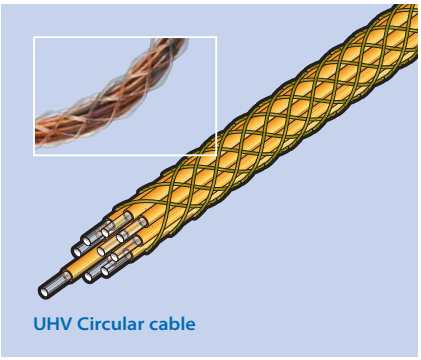
In-vacuum wiring

Kapton® and PTFE Insulated ribbon cable

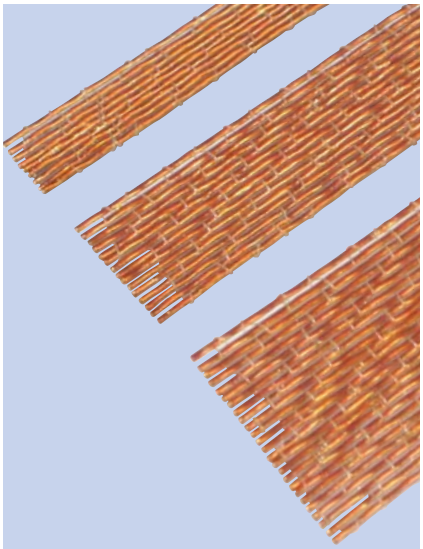




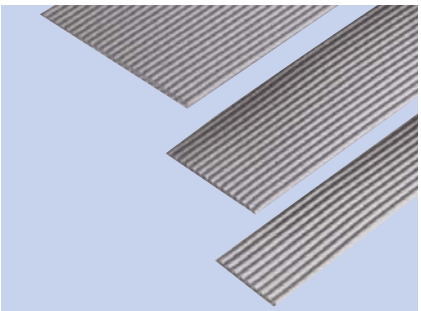
KAP50-5



UHV Circular cable



KAP-R25-500, -R15-500 and -R9-500



HVRT, 15 and 25

UHV **50Ω coaxial cable**

Cable type	Cable length mm	Jacket diameter	Wire diameter	Reference	Part number
Coaxial	5000	2.3	7 x 0.15	KAP50-5	**1512006**

Resistance of 140Ω/km, a capacitance 95pf/m, a voltage rating of 600VAC, 2kVDC and a current of 1A.

UHV **Circular cable** Colour coded

No. of wires	Cable length mm	Jacket diameter	Braid diameter	Insulator diameter	Wire diameter	Reference	Part number
9	500	1.47	1.22	0.89	7 x 0.102	CCAB9-500	**1512761**
9	1000	1.47	1.22	0.89	7 x 0.102	CCAB9-1000	**1512762**
9	2500	1.47	1.22	0.89	7 x 0.102	CCAB9-2500	**1512763**

9 way cable with a PEEK® woven outer sleeving.

Resistance of 244Ω/km, a voltage rating of 600VAC, 840VDC and a current of 5A.

UHV **Kapton® insulated** and HV **PTFE Ribbon cable**

No. of wires	Cable length mm	Cable width	Cable thickness	Wire diameter	Reference	Part number
UHV **Kapton® insulated**						
9	500	11	1	7 x 0.127	KAP-R9-500	**1512100**
9	1000	11	1	7 x 0.127	KAP-R9-1000	**1512103**
9	2500	11	1	7 x 0.127	KAP-R9-2500	**1512150**
15	500	19	1	7 x 0.127	KAP-R15-500	**1512101**
15	1000	19	1	7 x 0.127	KAP-R15-1000	**1512104**
15	2500	19	1	7 x 0.127	KAP-R15-2500	**1512151**
25	500	30	1	7 x 0.127	KAP-R25-500	**1512102**
25	1000	30	1	7 x 0.127	KAP-R25-1000	**1512105**
25	2500	30	1	7 x 0.127	KAP-R25-2500	**1512152**
HV **PTFE insulated**						
9	500	10	1	7 x 0.2	HVR9-500	**1512770**
9	1000	10	1	7 x 0.2	HVR9-1000	**1512771**
9	2500	10	1	7 x 0.2	HVR9-2500	**1512772**
15	500	19	1	7 x 0.2	HVR15-500	**1512773**
15	1000	19	1	7 x 0.2	HVR15-1000	**1512774**
15	2500	19	1	7 x 0.2	HVR15-2500	**1512775**
25	500	30	1	7 x 0.2	HVR25-500	**1512776**
25	1000	30	1	7 x 0.2	HVR25-1000	**1512777**
25	2500	30	1	7 x 0.2	HVR25-2500	**1512778**

Voltage rating of 1kVAC, 4kVDC and a current 1A maximum.

Use two lengths of 25-wire cable for 50 pin applications.

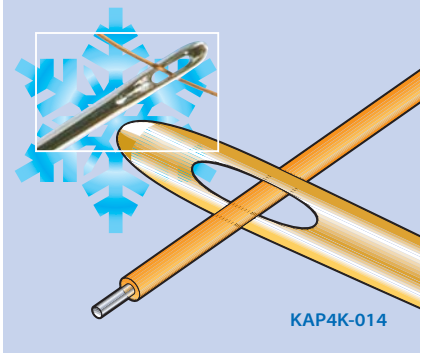
All UHV cable assemblies are bakeable to 260˚C.

All HV cable assemblies are bakeable to 105˚C.

All dimensions are nominal in millimetres unless specified.

In-vacuum wiring

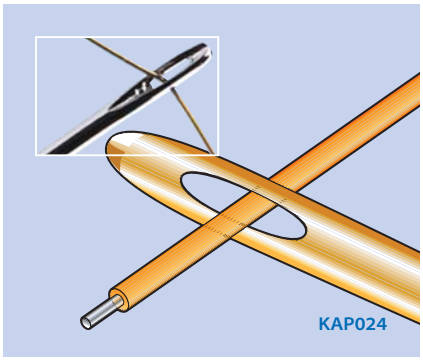
Kapton® insulated



UHV 0.12mm cryogenic instrumentation wire

Cable type	Cable length mm	Jacket diameter	Wire diameter	Reference	Part number
Plain	10000	0.39	0.12	KAP4K-014	**1512081**

This is an ultra thin non-magnetic UHV compatible connecting wire suitable for use in cryogenic systems down to liquid helium temperature -269°C (4°K) and a voltage rating of 2kVDC.



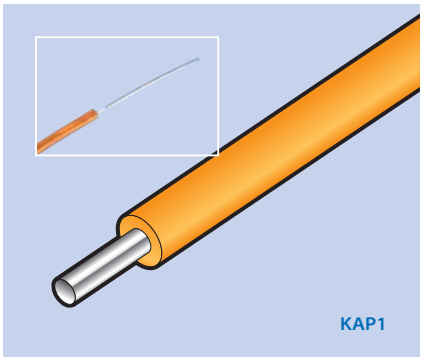
UHV Fine instrumentation wire

Cable type	Cable length mm	Jacket diameter	Wire diameter	Reference	Part number
Plain [2]	10000	0.50	7 x 0.08	KAP08 [1]	**1512001**
Plain [3]	10000	0.39	0.12	KAP012	**1512000**

[1] Ideally suited for delicate instrumentation applications such as UHV AFM and STM.

[2] Resistance of 510Ω/km.

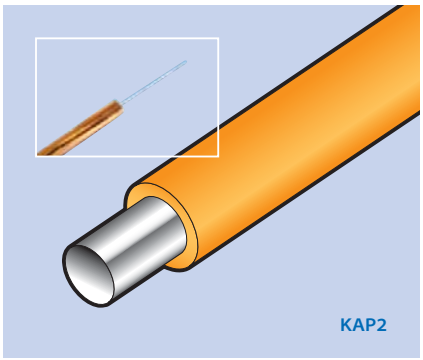
[3] Resistance of 1.6kΩ/km.



UHV 0.25mm diameter wire

Cable type	Cable length mm	Jacket diameter	Wire diameter	Reference	Part number
Plain	10000	0.53	0.25	KAP1	**1512002**

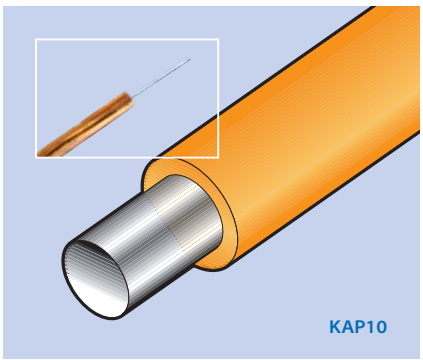
Resistance of 375.8Ω/km, a voltage rating of 600VAC, 2kVDC and a current of 1.5A.



UHV 0.61mm diameter wire

Cable type	Cable length mm	Jacket diameter	Wire diameter	Reference	Part number
Plain	10000	0.87	0.61	KAP2	**1512003**

Resistance of 64.0Ω/km, a Voltage rating of 600VAC, 2kVDC and a current of 5.5A.



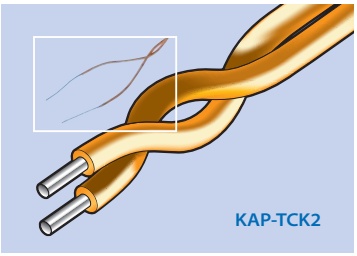
UHV 1mm diameter wire

Cable type	Cable length mm	Jacket diameter	Wire diameter	Reference	Part number
Plain	10000	1.52	1.00	KAP10	**1512009**

Resistance of 14.3Ω/km, a voltage rating of 3.6kVAC, 5kVDC and a current of 10A.

All dimensions are nominal in millimetres unless specified.

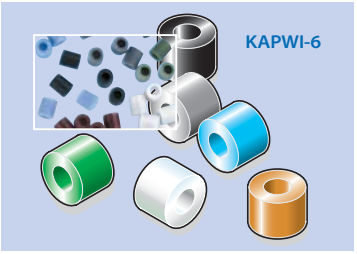
In-vacuum wiring
Accessories



UHV Thermocouple cryogenic instrumentation wire

Cable type	Cable length	Wire diameter	Reference	Part number
Type-K	2000	0.20	KAP-TCK2	**1512070**

Chromel® and Alumel® twisted thermocouple pair.
Wire ends are not welded and left open for customer use and installation.
For use with low voltage instrumentation applications only.



UHV Coloured indentification beads

Cable type	Bead length	Maximum wire diameter	Reference	Part number
All	2.3	0.89	KAPW1-6	**1510200**

Ideally suited for Kapton® insulation stripping. Ideally suited for the identification of in-vacuum.
Kapton® insulated wires which have no colour identification.
Each kit consists of 6 packs of 50 beads in 6 different colours – green, grey, blue, brown, white and black.

Kapton® wire strippers

Cable type	Minimum diameter	Maximum diameter	Reference	Part number
All	0.12	0.40	KAPS1	**1512050**
All	0.25	0.80	KAPS2	**1512051**

Ideally suited for Kapton® insulation stripping.

UHV Conductive glue

Cable type	Minimum temperature	Reference	Part number
Conductive	150˚	UHVGLUE-H21D	**1260217**
Conductive	270˚	UHVGLUE-H27D	**1260218**

Important			
Description	**Hardening times**	**Shelf life**	**Resistivity**
HD21	5 mins at 150°C or 12 hrs at 50C°	See pack	0.1 to 0.3mΩcm
HD27	1 hr at 150°C	See pack	0.1 to 0.3mΩcm

Ideally suited for fine instrumentation wires. Available in 28 gram containers.

UHV Glue 1 conducting

Features

- UHV compatible
- Two versions bakeable to 150°C or 270°C respectively
- UHV Glue is a two-component thermally and electrically conductive epoxy, it is available in two grades for medium or high temperature use
- 28g cartons

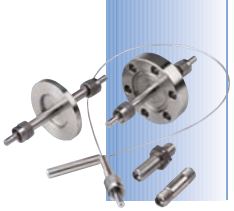
UHV Glue 2 non-conducting

Features

- UHV compatible
- 85g cartons
- Bakeable to 150°C
- UHV Glue 2 is a two-component, thermally conductive but electrically insulating epoxy. It has been used successfully on UHV mechanisms such as AFM's at base pressures below 10^{-10} mbar
- 'Mixed' glue has 24 hour lifetime
- Must be cured at 150°C for one hour to harden

Description	Reference	Part number
Epoxy patch	EP-1	**432037**
UHV glue 1 conducting, maximum temperature 150°C	UHVGLUE-H21D	**1260217**
UHV glue 1 conducting, maximum temperature 270°C	UHVGLUE-H27D	**1260218**

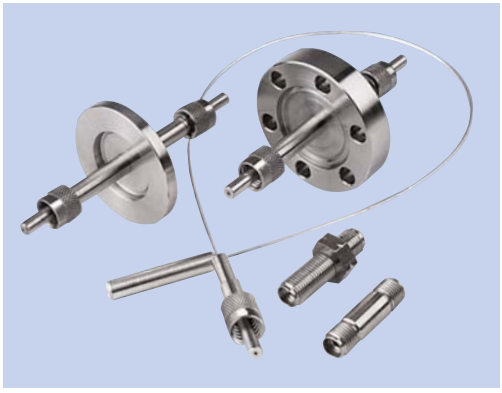
All dimensions are nominal in millimetres unless specified.



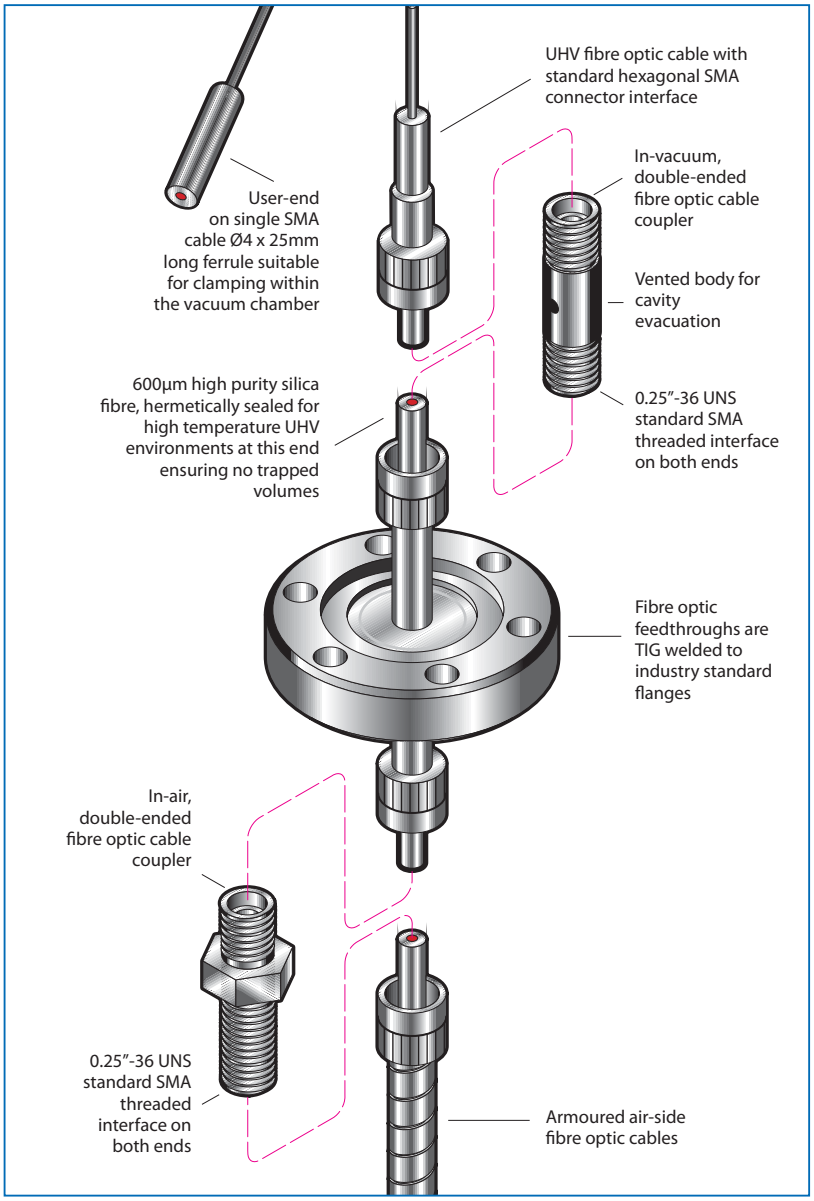
Fibre optics
Feedthroughs

Features

- UHV Compatible materials
- High temperature rated to 200°C
- Multimode step index fibre
- High purity synthetic silica
- SMA-905 connector interface
- Brazed seals prevent outgassing
- Doped silica cladding
- Copper metal coating
- Maximum intensity of transmitted power, using a Nd-YAG laser is 100kW/cm2 in continuous wave mode and 500kW/cm2 in pulses <1µs
- Feedthrough transmission loss 2db typical



MDC Vacuum Limited now provide 600µm fibre optic feedthroughs and accessories which allow fibre optic connections from inside a vacuum system to external instrumentation or energy sources. These high temperature fibre optic products are ideally suited for UHV service in medical, industrial and research applications. UHV fibre optic cable is cleaned and prepared for ultrahigh vacuum service. It is bakeable to 200°C and constructed only from silica and copper. Available in UV or IR specifications these cables and feedthroughs come complete with SMA-905 connectors or polished and capped ends. The pure silica core provides very low loss and good immunity to radiation damage. Fibres are coated with a layer of copper which gives added strength and high temperature service capabilities. These fibres offer an extended transmission range when compared to conventional silica fibres and are commonly referred to as "Dry" or "Low OH" silica.



Specifications

Transmission range		
UV		180nm to 1200nm
IR		500nm to 2600nm
Attenuation		
Typical spot values		
UV	248nm, KrF laser	<1.2 dB/m
	308nm, XeCl laser	<0.26 dB/m
IR	1.06µm, ND-YAG laserr	<0.01 dB/m
Bend radius		
Short term		40 x fibre radius
Long term		200 x fibre radius
Numerical aperture		0.22 ± 0.02
Materials		
Core		600µm diameter high purity synthetic silica
Cladding		618µm ± 31µm diameter doped silica
Core to cladding ratio		1:1.06
Coating		Copper 165µm ± 65µm thickness
Vacuum range		
UHV / HV		$1x10^{-10}$ / $1x10^{-8}$ mbar
Temperature range [1]		
Feedthrough		200°C
Cable Copper coated		-196 to 200°C

[1] Overall assembly ratings must be adjusted to that of the lowest rated component.

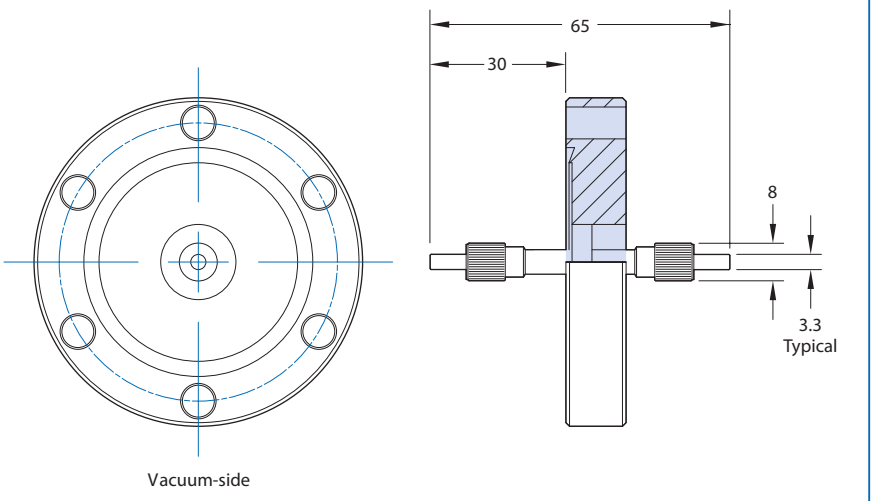
All dimensions are nominal in millimetres unless specified.

Fibre optics
Feedthroughs

UHV, UV and IR **Fibre optic feedthrough**

Feedthrough type	Flange	Reference	Part number
UV + IR	DN16CF	FFT-600-C16	**1513411**
UV + IR	DN40CF	FFT-600-C40	**1513412**

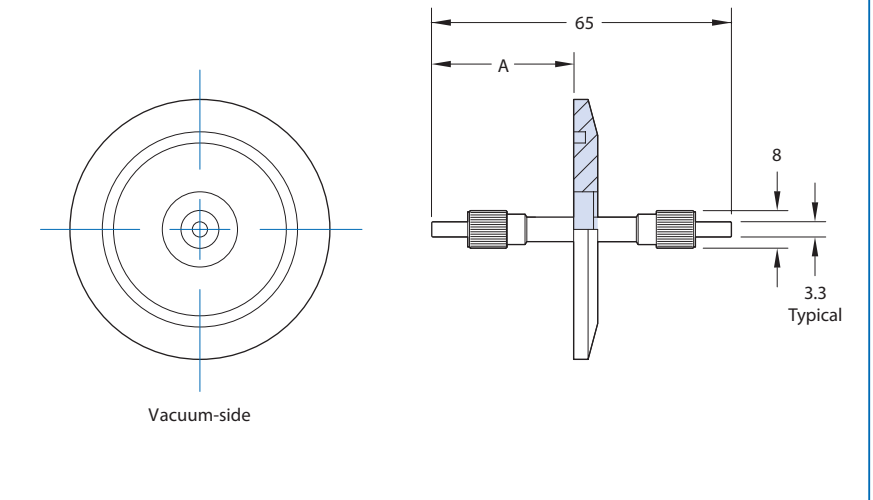
FFT-600-C40



HV, UV and IR **Fibre optic feedthrough**

Flange type	Flange	A mm	Reference	Part number
UV + IR	DN16KF	28.8	FFT-600-K16	**1513413**
UV + IR	DN40KF	31.3	FFT-600-K40	**1513414**

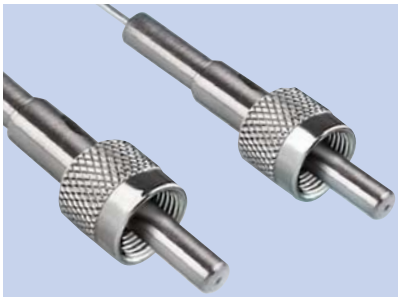
FFT-600-K40



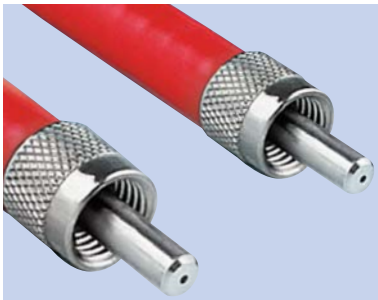
All dimensions are nominal in millimetres unless specified.

Fibre optics
Cables and couplers

FO-UV600-300S Single SMA



FO-IR600-300D Dual SMA



CP-IR600-5

ADVS

ADAS

UHV, UV and IR **Fibre optic feedthrough**

Fibre type	Connector type	Cable length	Core	Connector diameter	Connector length	Reference	Part number
Ultraviolet							
UV	Single SMA	300	600µm	8	24	FO-UV600-300S	**1513000**
UV	Single SMA	600	600µm	8	24	FO-UV600-600S	**1513001**
UV	Single SMA	900	600µm	8	24	FO-UV600-900S	**1513002**
UV	Dual SMA	300	600µm	8	24	FO-UV600-300D	**1513100**
UV	Dual SMA	600	600µm	8	24	FO-UV600-600D	**1513101**
UV	Dual SMA	900	600µm	8	24	FO-UV600-900D	**1513102**
Infrared							
IR	Single SMA	300	600µm	8	24	FO-IR600-300S	**1513003**
IR	Single SMA	600	600µm	8	24	FO-IR600-600S	**1513004**
IR	Single SMA	900	600µm	8	24	FO-IR600-900S	**1513005**
IR	Dual SMA	300	600µm	8	24	FO-IR600-300D	**1513103**
IR	Dual SMA	600	600µm	8	24	FO-IR600-600D	**1513141**
IR	Dual SMA	900	600µm	8	24	FO-IR600-900D	**1513105**

Cables with single SMA connector are non-terminated on opposite end.

Air service **Armoured** UV and IR **Fibre optic cables**

Fibre type	Connector type	Cable length mm	Core	Connector diameter	Connector length	Reference	Part number
Ultraviolet							
UV	Dual SMA	5000	5	8	15	CP-UV600-5	**1513300**
UV	Dual SMA	1000	5	8	15	CP-UV600-10	**1513301**
Infrared							
IR	Dual SMA	5000	5	8	15	CP-IR600-5	**1513200**
IR	Dual SMA	1000	5	8	15	CP-IR600-10	**1513201**

MDC Vacuum's armoured fibre optic cables are fitted with 1/4"-36 UNC SMA connectors on both ends.
Fibre optic couplers are required when connecting to other cables or feedthroughs.

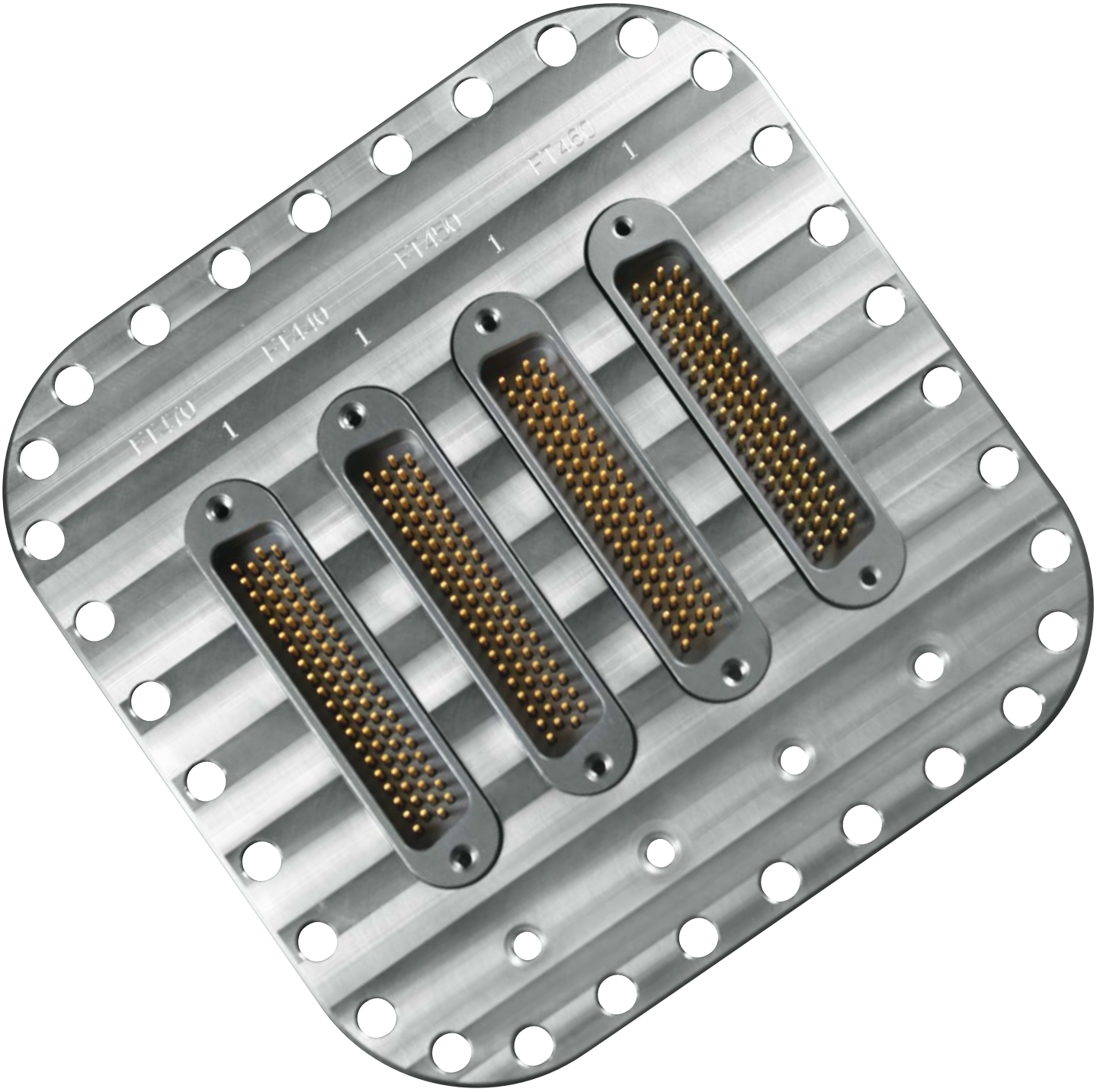
UHV/Air service **Fibre optic couplers**

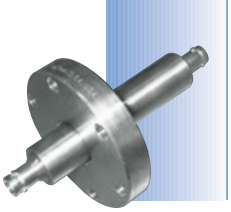
Service type	Connector type	Thread size	Length	Width across flats	Reference	Part number
Vacuum	Dual SMA	1/4"-36	25.4	-	ADVS	**1513400**
Air	Dual SMA	1/4"-36	25.4	9.5	ADAS	**1513401**

Vacuum couplers do not have hexagonal wrench flats and include an in-vacuum vent hole.

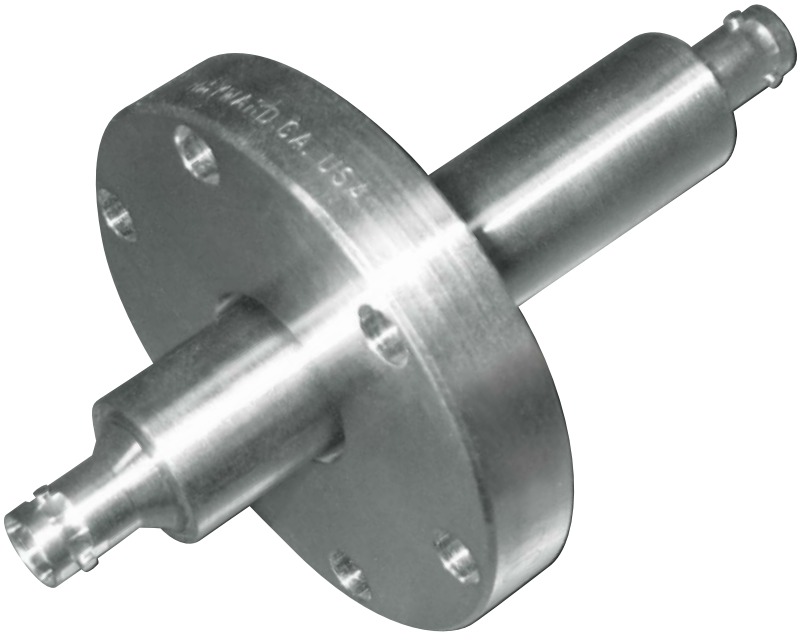
All dimensions are nominal in millimetres unless specified.

Special fabrications

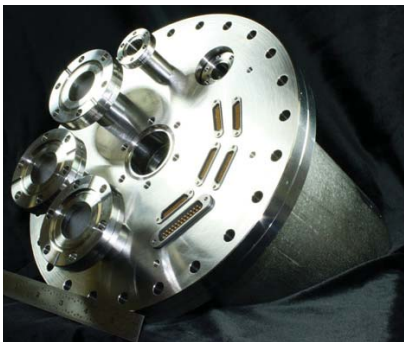




Special fabrications



Special fabrications



Special fabrications