

# Multi-pin feedthroughs

## Introduction



Multi-pin is the classification given by Caburn-MDC to all feedthrough products containing one or more conductor pins, which are also fitted with air or side threaded connectors.

Multi-pin feedthroughs are commonly used for the transmission of electrical signals and/or low power applications. They are typically referred to as instrumentation feedthroughs, because of their use in instrumentation applications such as electron microscopy, surface analysis and semiconductor process controls.

### Circular connectors

3 to 7 pins, were developed for applications requiring moderate pin density while maintaining relatively small package size. These products are fitted with dependable, screw type air-side connectors.

### MS circular connectors

4 to 35 pins, were developed for similar purposes, but fitted with industry standard threaded connectors, which meet MIL-C-5015 specifications. These feedthroughs are offered with electrical ratings up to 1750V and 23A.

### Subminiature-C

Subminiature-C, the latest addition to a comprehensive line of glass-ceramic, 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 metal seal flange as well as ISO KF16 elastomer seal quick-style flanges. Nine 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 an air-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 polarizing key. Air to vacuum pin positions are identified with a permanent surface indentation to facilitate the pin assignment operation.

### Subminiature-D

Type-D subminiature feedthroughs are high density multi-pin 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 techniques. Additional units may be purchased as stand-alone items. For vacuum-side connections a Kapton® insulated in-vacuum ribbon cable and PEEK material Type-D connectors meet the rigorous demands of UHV environments. In-vacuum cables and connectors are not included with the feedthrough assembly and must be purchased separately.

### Intended operating conditions

Electrical ratings are determined by various factors, including dielectric strength, geometry and system operating pressure. Please note that all the products in this catalogue are electrically rated for operation with one side in dry atmospheric conditions and the other side in a vacuum environment with a maximum system pressure of  $1 \times 10^{-4}$  mbar. We advise that users make allowances for deviations from stated operating parameters and take adequate safety precautions when feedthroughs are operated at high voltages or high currents.

### UHV and HV series

Caburn-MDC offers three standard vacuum mount styles: CF, ISO KF and weldable. Additional configurations are available upon request.

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

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Multi-pin feedthroughs

Introduction



Multi-pin

General specifications

Type	Specification voltage/current per pin	Maximum bakeout temperature	Conductor materials	Number of pins	Maximum current All pins loaded
<div>Multi-pin</div> 	500V DC 3.5A	CF Flange 450°C ISO KF flange 150°C Weldable 450°C Connector 65°C	Molybdenum	3, 5 and 7	3 pins – 6A 5 pins – 10A 7 pins – 15A
<div>MS Multi-pin Single ended</div> 	700V DC 10A	CF Flange 450°C ISO KF flange 150°C Weldable 450°C Connector 65°C	Alumel	4 to 35	4 pins – 28A 6 pins – 36A 10 pins – 50A 20 pins – 75A 35 pins – 100A
<div>MS Multi-pin Double ended</div> 	700V DC 10A	CF Flange 450°C ISO KF Flange 150°C Weldable 450°C Air-side connector 350°C Vacuum-side connector 350°C	Alumel	4 to 35	4 pins – 28A 6 pins – 36A 10 pins – 50A 20 pins – 75A 35 pins – 100A
<div>MS Multi-pin High current</div> 	700V 15 or 23A	DN40CF flange 450°C Connector 125°C	Copper or nickel	2 to 8	Not critical
<div>Sub-C Instrumentation</div> 	300V Low amps	CF Flange 250°C ISO KF 150°C Air-side connector 60°C Vacuum-side connector 250°C	Ni-Fe alloy Gold plated	9	Instrumentation signal voltage and currents
<div>Sub-D Instrumentation</div> 	300V Low amps	CF Flange 250°C ISO KF 150°C Air-side connector 60°C Vacuum-side connector 250°C	Ni-Fe alloy Gold plated	9, 15, 25, and 50	Instrumentation signal voltage and currents

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



## Section 6.1 Multi-pin

500V / 3.5A



### Features

- For instrumentation applications requiring moderate pin density
- UHV compatible materials
- 3 to 7 pins
- Air-side connector included
- 3 standard vacuum mounting styles
- Custom feedthrough configurations available upon request

### Specifications

**Voltage**<sup>1</sup> 500V DC maximum

**Current** 3.5A per pin

Maximum, all pins loaded:

3 pins 6A

5 pins 10A

7 pins 15A

### Material

Flanges 304ss

Shell Stainless steel

Pins Molybdenum

Insulation Alumina ceramic

**Vacuum range** UHV/HV  $1 \times 10^{-10}$  mbar /  $1 \times 10^{-8}$  mbar

### Temperature range

<sup>2</sup>

CF Flange mounted feedthrough -50°C to 450°C

ISO KF flange mounted feedthrough -20°C to 150°C

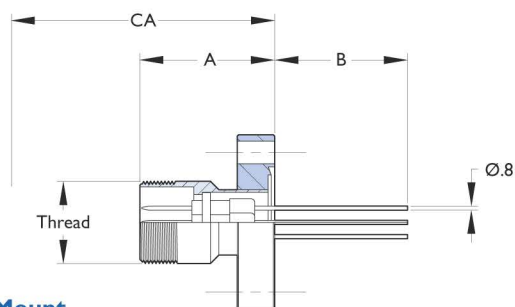
Weldable feedthrough -50°C to 450°C

Air-side connector -50°C to 65°C

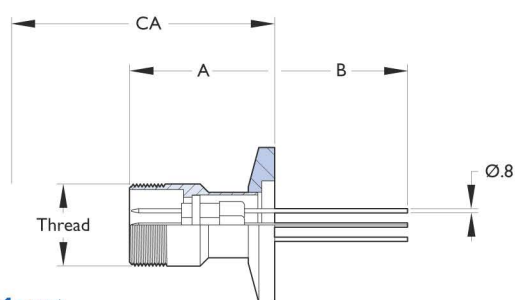
<sup>1</sup> Electrical ratings are safe operating limits

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

### UHV and HV series



CF Mount



KF Mount

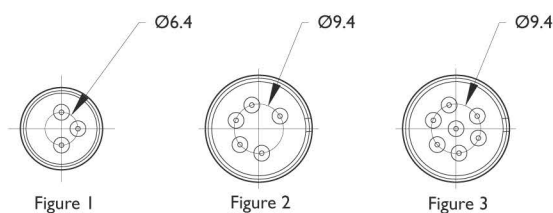
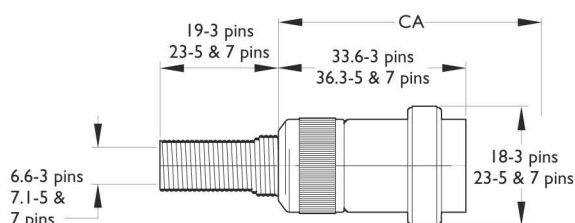


Figure 3 Air side



Air side connector

See intended operating parameters in introductory section

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CF



No. of pins	Flange mount	End view figure	A	B	Thread	CA	Reference	Part number
3	DN16CF	1	26	50	5/8"-27	52	IFM3-C16	9112000
5	DN16CF	2	34	40	13/16"-27	52	IFM5-C16	9112001
5	DN40CF	2	23	52	13/16"-27	52	IFM5-C40	9112002
7	DN16CF	3	34	40	13/16"-27	52	IFM7-C16	9112003
7	DN40CF	3	23	52	13/16"-27	52	IFM7-C40	9112004

Air-side connector included at no extra cost

ISO KF



No. of pins	Flange mount	End view figure	A	B	Thread	CA	Reference	Part number
3	DN16KF	1	27	48	5/8"-27	64	IFM3-K16	9113000
3	DN40KF	1	25	51	5/8"-27	51	IFM3-K40	9113001
5	DN16KF	2	34	40	13/16"-27	64	IFM5-K16	9113002
5	DN40KF	2	21	53	13/16"-27	51	IFM5-K40	9113003
7	DN16KF	3	34	40	13/16"-27	64	IFM7-K16	9113005
7	DN40KF	3	21	53	13/16"-27	51	IFM7-K40	9113006
7	DN50KF	3	21	53	13/16"-27	51	IFM7-K50	9113007

Air-side connector included at no extra cost

Weldable



No. of pins	Weld dia.	End view fig.	A	B	C	D	E	Thread	CA	Reference	Part number
3	12.7	1	51	12.6	9.6	0.6	.51	5/8"-27	52	IFM3	9111000
5	19.05	2	21	53	19	8.9	.9	13/16"-27	63.5	IFM5	9111001
7	19.05	3	21	53	19	8.9	.9	13/16"-27	52	IFM7	9111002

Air-side connector included at no extra cost

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





## Section 6.1

## Multi-pin

700V / 10A / single ended



MS Multi-pin, single ended feedthroughs.

## Features

- For instrumentation applications requiring moderate pin density
- UHV-compatible materials
- 4 to 35 pins
- Air-side connector included
- Industry standard threaded connectors
- Three standard vacuum mounting styles.
- Custom feedthrough configurations available upon request

## Specifications

**Voltage<sup>1</sup>** 700V DC maximum**Current** 10A per pin

Maximum, all pins loaded:

4 pins	28A
6 pins	36A
10 pins	50A
20 pins	75A
35 pins	100A

**Material**

Flanges 304ss

Shell Stainless steel

Pins Alumel

Insulation Alumina ceramic

**Vacuum range** UHV/HV  $1 \times 10^{-10}$  mbar /  $1 \times 10^{-8}$  mbar**Temperature range<sup>2</sup>**

CF Flange mounted feedthrough -55°C to 450°C

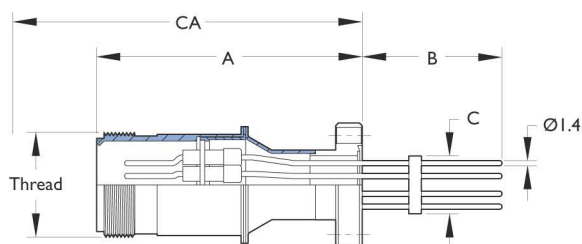
ISO KF flange mounted feedthrough -20°C to 150°C

Weldable feedthrough -55°C to 450°C

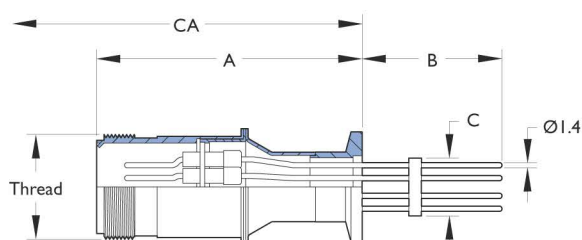
Air-side connector -55°C to 125°C

<sup>1</sup> Electrical ratings are safe operating limits<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

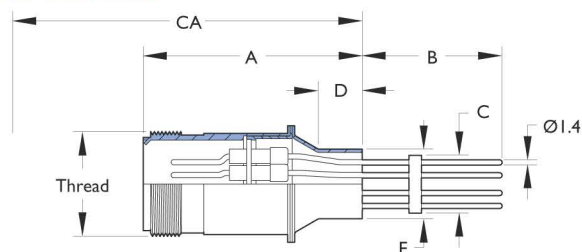
## UHV and HV series



## CF Mount



## ISO KF Mount



## Weldable

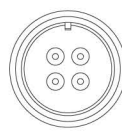


Figure 1

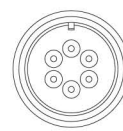


Figure 2

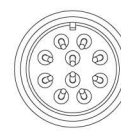


Figure 3

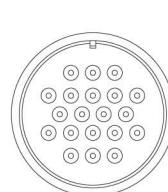


Figure 4

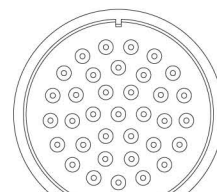
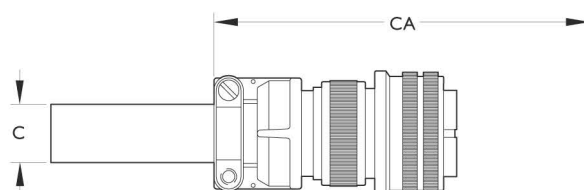


Figure 5

## End views Air side



## Air side connector

See intended operating parameters in introductory section

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CF



No. of pins	Flange mount	End view figure	A	B	C	Thread	CA	Reference	Part number
4	DN16CF	1	69	69	16	1 1/8"-18	102	IFA4-C16	9132000
4	DN40CF	1	57	80	16	1 1/8"-18	102	IFA4-C40	9132001
6	DN16CF	2	69	69	16	1 1/8"-18	115	IFA6-C16	9132002
6	DN40CF	2	57	80	16	1 1/8"-18	104	IFA6-C40	9132003
10	DN16CF	3	69	69	16	1 1/8"-18	115	IFA10-C16	9132004
10	DN40CF	3	57	80	16	1 1/8"-18	104	IFA10-C40	9132005
20	DN40CF	4	69	88	16	1 3/4"-18	123	IFA20-C40	9132006

Air-side connector included at no extra cost

ISO KF



No. of pins	Flange mount	End view figure	A	B	C	Thread	CA	Reference	Part number
4	DN16KF	1	69	69	16	1 1/8"-18	115	IFA4-K16	9133000
4	DN40KF	1	56	81	16	1 1/8"-18	103	IFA4-K40	9133001
6	DN16KF	2	69	69	16	1 1/8"-18	115	IFA6-K16	9133002
6	DN40KF	2	56	81	16	1 1/8"-18	103	IFA6-K40	9133003
10	DN16KF	3	69	69	16	1 1/8"-18	115	IFA10-K16	9133004
10	DN40KF	3	56	81	16	1 1/8"-18	103	IFA10-K40	9133005
20	DN40KF	4	64	69	16	1 3/4"-18	122	IFA20-K40	9133006

Air-side connector included at no extra cost

Weldable



No. of pins	End view figure	A	B	C	D	E	Thread	CA	Reference	Part number
4	1	60	81	16	12	19	1 1/8"-18	103	IFA4	9131000
6	2	60	81	16	12	19	1 1/8"-18	103	IFA6	9131001
10	3	60	81	16	12	19	1 1/8"-18	103	IFA10	9131002
20	4	64	89	32	19	35	1 3/4"-18	121	IFA20	9131003
35	5	79	76	37	34	44	2 1/4"-16	139	IFA35	9131004

Air-side connector included at no extra cost

Accessories



Description	Material	See page	Quantity per pack	Reference	Part number
Crimp	Nickel-200	188	5	TCP-NI	9923018
Ceramic spacer 4/10 pin	Alumina	209	1	CS4/10-2	9951100
Ceramic spacer 6 pin	Alumina	209	1	CS6-2	9951101
Ceramic bead	Alumina	209	85	CB064	9951001

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MS Multi-pin,  
double ended  
feedthroughs

## Features

- For instrumentation applications requiring moderate pin density
- UHV compatible materials
- 4 to 35 pins
- Air-side and vacuum-side connectors included
- Industry standard threaded connectors
- Standard vacuum mounting style.
- Custom feedthrough configurations available upon request

## Specifications

**Voltage<sup>1</sup>** 700V DC maximum

**Current** 10A per pin

Maximum, all pins loaded:

4 pins	28A
6 pins	36A
10 pins	50A
20 pins	75A
35 pins	100A

### Material

Flanges	304ss
Shell	Stainless steel
Pins	Alumel
Insulation	Alumina ceramic

**Vacuum range** UHV / HV  $1 \times 10^{-10}$  mbar

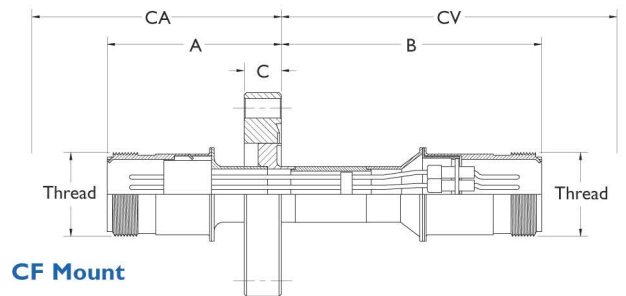
### Temperature range<sup>2</sup>

CF Flange mounted feedthrough	-100°C to 350°C
ISO KF Mounted feedthrough	-20°C to 150°C
Weldable feedthrough	-100°C to 350°C
Air/Vacuum-side connector	-100°C to 350°C

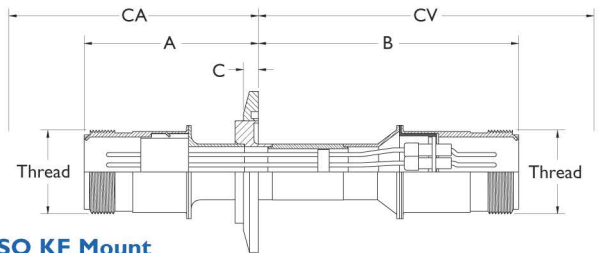
<sup>1</sup> Electrical ratings are safe operating limits

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

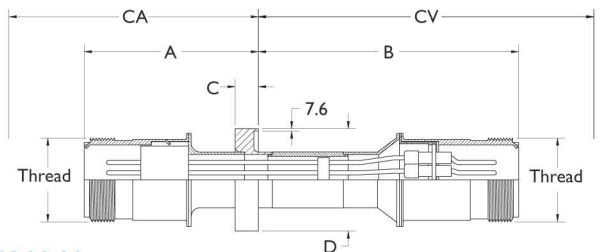
## UHV Series



CF Mount



ISO KF Mount



Weldable

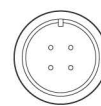


Figure 1

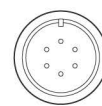


Figure 2

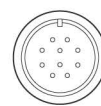


Figure 3

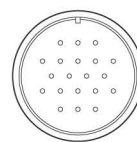


Figure 4

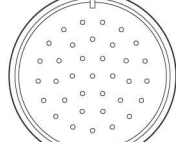
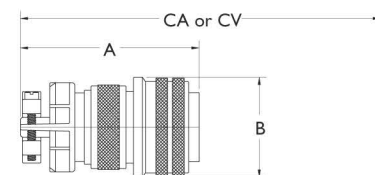


Figure 5

### End views Air and vacuum side



### Air and vacuum side connector

See intended operating parameters in introductory section



CF



No. of pins	Flange mount	End view figure	A	B	Thread	CA	CV	Reference	Part number
4	DN40CF	1	61	88	1 1/8"-18	108	134	IFA4D-C40	9132010
6	DN40CF	2	61	88	1 1/8"-18	108	134	IFA6D-C40	9132011
10	DN40CF	3	61	88	1 1/8"-18	108	134	IFA10D-C40	9132012
20	DN63CF	4	72	88	1 3/4"-18	129	129	IFA20D-C63	9132013
35	DN100CF	5	65	98	2 1/4"-16	125	125	IFA35D-C100	9132014

Air-side connector included at no extra cost

ISO KF



No. of pins	Flange mount	End view figure	A	B	Thread	CA	CV	Reference	Part number
4	DN40KF	1	62	86	1 1/8"-18	109	133	IFA4D-K40	9133009
6	DN40KF	2	62	86	1 1/8"-18	109	133	IFA6D-K40	9133011
10	DN40KF	3	62	86	1 1/8"-18	109	133	IFA10D-K40	9133013

Air-side connector included at no extra cost

Weldable



No. of pins	Weld dia.	End view fig.	A	B	C	D	Thread	CA	CV	Reference	Part number
4	35	1	60	89	8	35	1 1/8"-18	106	135	IFA4D-35	9131005
6	35	2	60	89	8	35	1 1/8"-18	106	135	IFA6D-35	9131006
10	35	3	60	89	8	35	1 1/8"-18	106	135	IFA10D-35	9131007
20	64	4	71	89	10	63	1 3/4"-18	128	146	IFA20D-35	9131008
35	64	5	64	99	10	63	2 1/4"-18	123	158	IFA35D-35	9131009

Air-side connector included at no extra cost

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





## Section 6.1

# Multi-pin

700V / up to 23A

Multi-pin



### Features

- DN40CF Flange mounting
- For high-current applications requiring moderate pin density
- UHV-compatible materials
- 2 to 8 pins
- Air-side connector included
- Industry standard threaded connectors
- Custom feedthrough configurations available upon request

### Specifications

<b>Voltage<sup>1</sup></b>	700V DC maximum
<b>Current</b>	15A per nickel pin or 23A per copper pin

Maximum, all pins loaded:

Any number of pins	Not critical
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#### Material

Flanges	304ss
Shell	Stainless steel
Pins	Copper or nickel
Insulation	Alumina ceramic

<b>Vacuum range UHV</b>	$1 \times 10^{-10}$ mbar
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#### Temperature range<sup>2</sup>

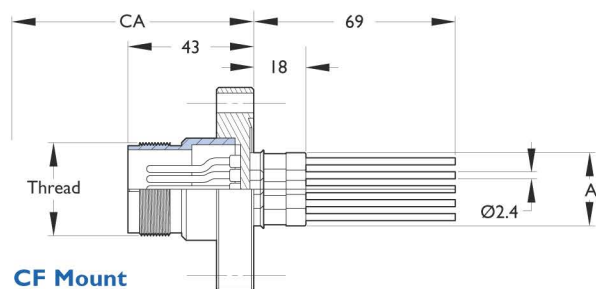
CF Flange mounted feedthrough	-55°C to 450°C
Air-side connector	-55°C to 125°C

<sup>1</sup> Electrical ratings are safe operating limits

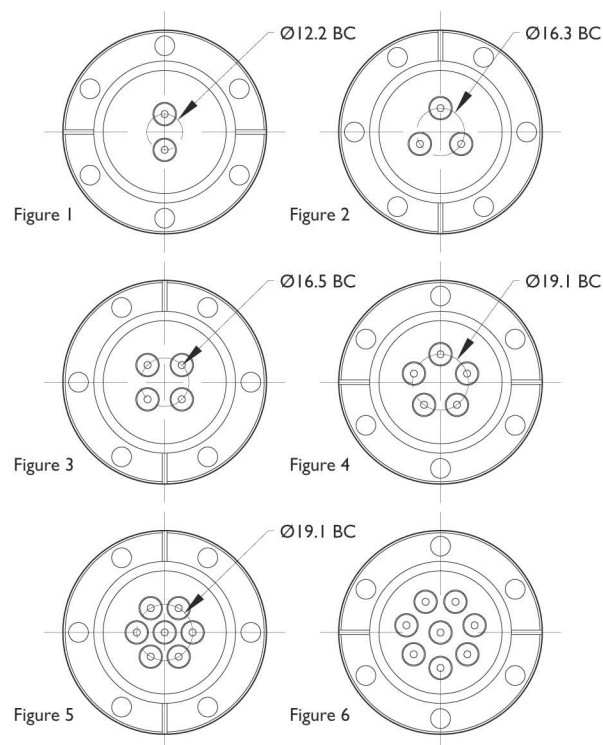
<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

## Feedthroughs – electrical and optical

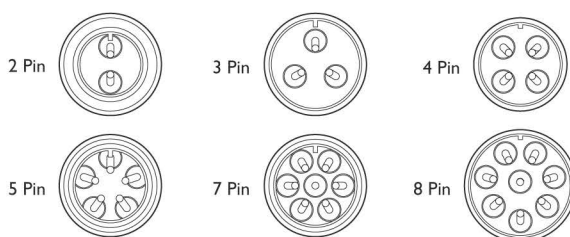
### UHV Series



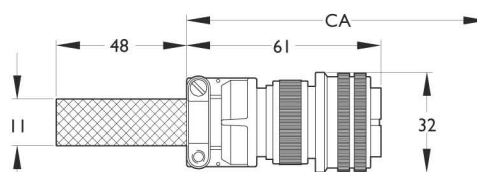
CF Mount



### Weldable



### End views Air side



### Air side connector

See intended operating parameters in introductory section

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CF



No. of pins	End view figure	A	Conductor material	Amps	Thread	CA	Reference	Part number
DN40CF Flange mount								
2	1	21	Nickel	15	1"-20	86	IFN2-C40	9142001
3	2	25	Nickel	15	13/8"-18	94	IFN3-C40	9142003
4	3	25	Nickel	15	11/4"-18	94	IFN4-C40	9142005
5	4	27	Nickel	15	11/8"-18	94	IFN5-C40	9142007
7	5	25	Nickel	15	11/4"-18	94	IFN7-C40	9142009
8	6	33	Nickel	15	11/2"-18	100	IFN8-C40	9142011

Air-side connector included at no extra cost

CF



No. of pins	End view figure	A	Conductor material	Amps	Thread	CA	Reference	Part number
DN40CF Flange mount								
2	1	21	Copper	23	1"-20	86	IFC2-C40	9142000
3	2	25	Copper	23	11/8"-18	94	IFC3-C40	9142002
4	3	25	Copper	23	11/4"-18	94	IFC4-C40	9142004
5	4	27	Copper	23	11/8"-18	90	IFC5-C40	9142006
7	5	25	Copper	23	11/4"-18	94	IFC7-C40	9142008
8	6	33	Copper	23	11/2"-18	100	IFC8-C40	9142010

Air-side connector included at no extra cost

Accessories



Description	Material	Quantity per pack	Reference	Part number
Power-push-on	BeCu	10	PPO-094	9924003
Power in line	BeCu	10	PIL-120	9924006
Ceramic bead	Alumina	56	CB102	9951003

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

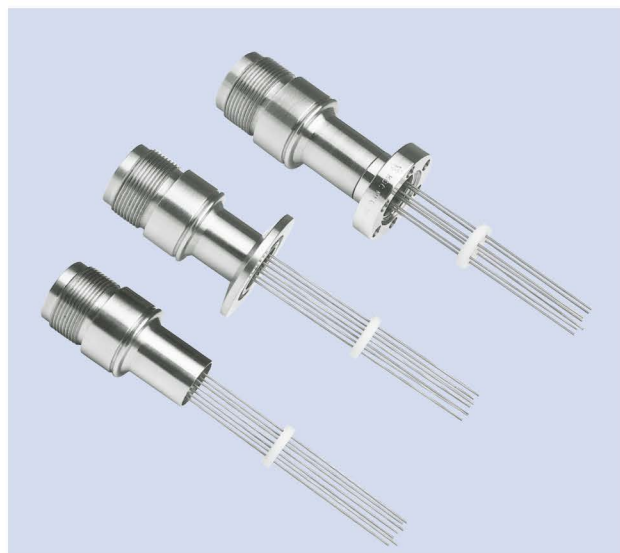


## Section 6.1

## Multi-pin

12,000V / 7.5A / 7 pins

## Feedthroughs – electrical and optical



## Features

- 7 pin configuration
- For high voltage applications requiring high density pin design
- Industry standard threaded connectors
- Air-side connector included
- 3 standard vacuum mounting styles available
- Custom feedthrough configurations available upon request
- 3 standard styles

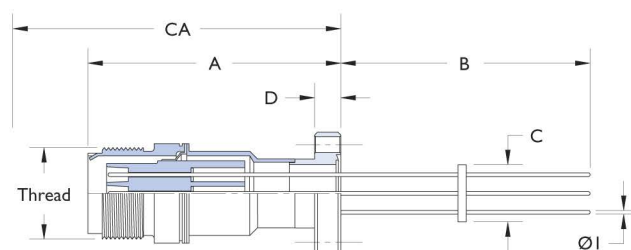
## Specifications

<b>Voltage<sup>1</sup></b>	12,000V DC
<b>Current</b>	7.5A/pin
Maximum, all pins loaded:	
7 pin	38A
<b>Material</b>	
Flanges	304ss
Adaptor	304ss
Conductor	Molybdenum
Insulation	Alumina ceramic
<b>Vacuum range</b> UHV/HV	$1 \times 10^{-10}$ mbar / $1 \times 10^{-8}$ mbar
<b>Temperature range<sup>2</sup></b>	
Feedthrough	-100°C to 450°C
CF Flange mounted feedthrough	-100°C to 450°C
ISO KF Flange mounted feedthrough	-20°C to 150°C
Weldable feedthrough	-100°C to 450°C
Air-side connector	-55°C to 125°C
<b>Dimensions</b>	Reference only, subject to change

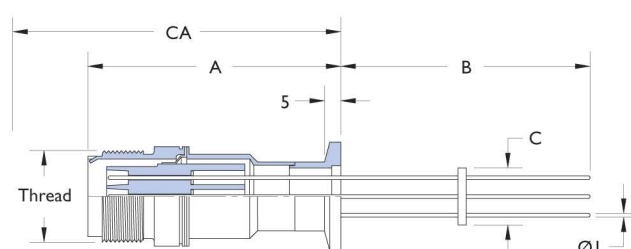
<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

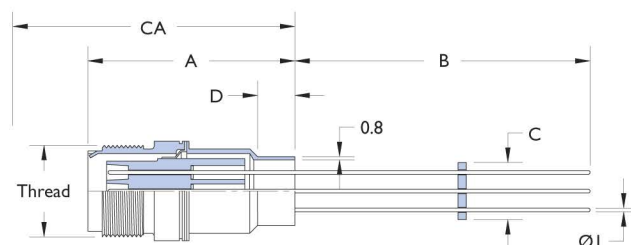
## UHV and HV series



CF Mount



ISO KF Mount



Weldable

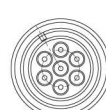


Figure 1

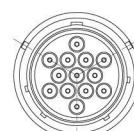
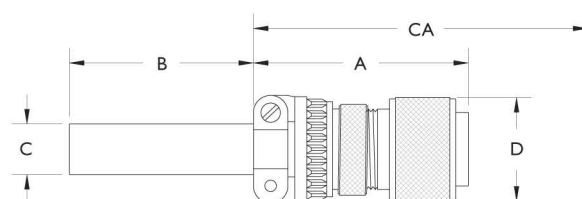


Figure 2

End view Air-side

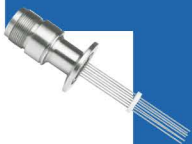


Connector Air-side

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

United Kingdom +44 (0) 1825 280 450 sales@mdcvacuum.co.uk  
 Germany +49 (0) 2305 947 508 sales@mdcvacuum.de  
 France +33 (0) 437 651 750 info@mdcvacuum.fr

MDC Vacuum Europe  
**MDC**  
 www.mdcvacuum.eu



CF



No. of pins	Flange mount	End view figure	A	B	C	D	Thread	CA	Reference	Part number
7	DN16CF	I	70	70	16	7	I-20	93	HVIFM7-C16	9152000
7	DN40CF	I	59	80	16	13	I-20	89	HVIFM7-C40	9152001

Air-side connectors included at no extra cost

ISO KF



No. of pins	Flange mount	End view figure	A	B	C	Thread	CA	Reference	Part number
7	DN16KF	I	68	71	16	I-20	98	HVIFM7-K16	9153000
7	DN40KF	I	58	85	16	I-20	87	HVIFM7-K40	9153001
7	DN50KF	I	58	85	16	I-20	87	HVIFM7-K50	9153002

Air-side connectors included at no extra cost

Weldable



No. of pins	End view figure	A	B	C	D	Thread	CA	Reference	Part number
7	I	57	82	16	12	I-20	93	HVIFM7	9151000

Air-side connectors included at no extra cost



# Subminiature-C

## 9, 23, 37 and 60 pins



Feedthrough, cables and connector kit C9  
KIT-C16 shown

### 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  $2 \times 10^{-10}$  std. cc/sec of helium
- Air and vacuum connectors available

### Specifications

#### Voltage / Current ratings <sup>1</sup>

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® <sup>3</sup>
Vacuum	PEEK® <sup>2</sup>

#### Vacuum range

UHV (CF)	$1 \times 10^{-10}$ mbar
HV (KF)	$1 \times 10^{-8}$ mbar

#### Temperature range <sup>4</sup>

Feedthrough – CF	250°C
Feedthrough – KF	200°C
Connector – Air	80°C
Connector – Vacuum	250°C
Thermal gradient	25°C per minute max.

<sup>1</sup> 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).

<sup>2</sup> PEEK® is a Polyether-Etherketone thermoplastic.

DELIN® is an Acetal Homopolymer.

<sup>3</sup> Overall assembly ratings must be adjusted to that of the lowest rated component.

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 KF16 flanges. 9 gold plated pins are hermetically sealed and electrically insulated in a stainless steel shell using the latest in glass-ceramic bonding technology.

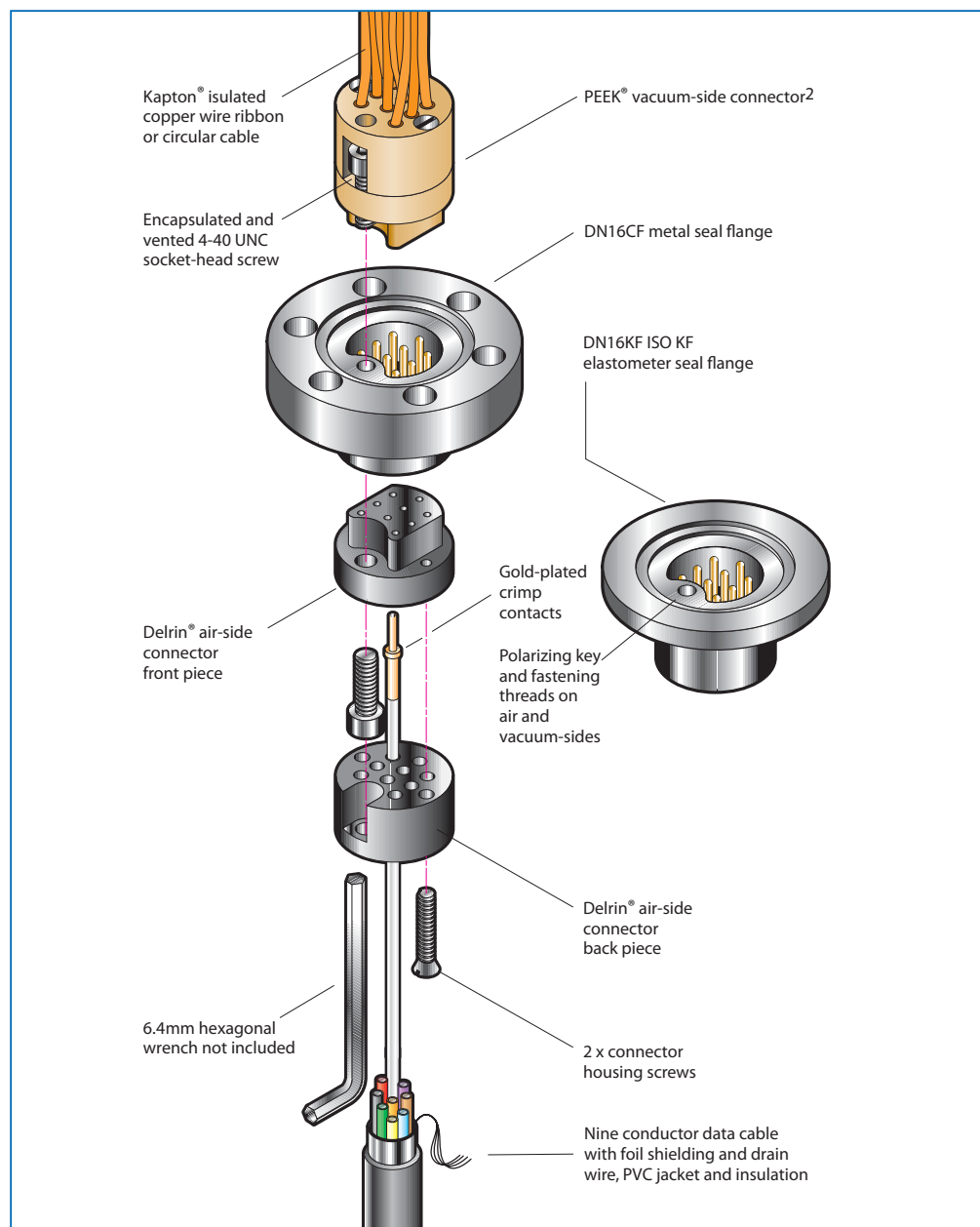
Each kit is supplied with both an air and vacuum-side cable assembly including connectors.

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.



All dimensions are nominal in millimetres unless specified.





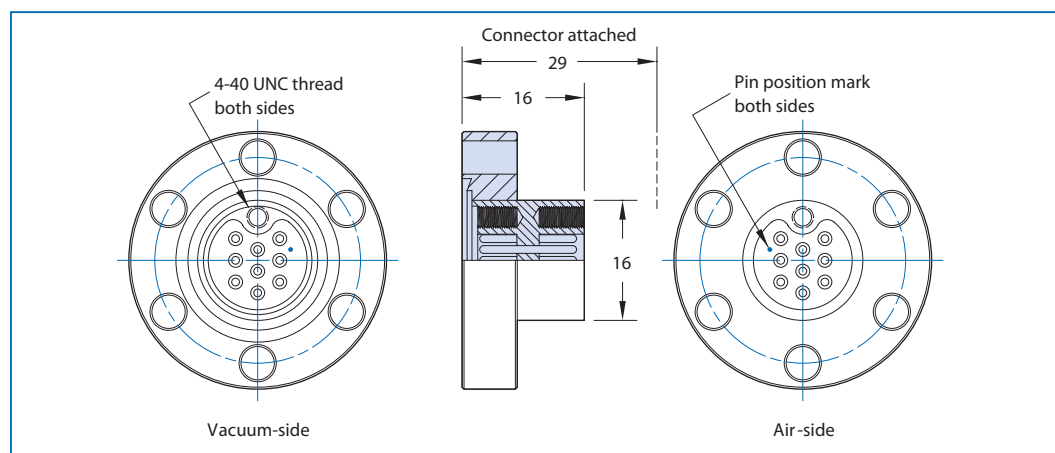
### UHV CF Flange with 9 pins

No. of pins	Flange	Description	Reference	Part number
9	DN16CF	Feedthrough, vacuum cable and air-side connector <sup>1</sup>	C9KIT-C16	<b>1512604</b>
9	DN16CF	Feedthrough only <sup>2</sup>	C9-C16	<b>1512600</b>
9	–	UHV Vacuum PEEK® Connector - male	C9-VCP	<b>1512606</b>
9	–	UHV Vacuum PEEK® Connector - female	C9-VCS	<b>1512603</b>
9	–	Air-side Delrin® Connector - female	C9-ACS	<b>1512602</b>
9	–	Male crimps (for C9-VCP) pack 10	DPINMC-10	<b>1510103</b>
9	–	Female crimps (for C9-VCS) pack 10	DPINFC-10	<b>1510102</b>

<sup>1</sup> Contains air and vacuum-side connectors with 96inch **2438mm** and 19inch **482mm** cable length respectively.

<sup>2</sup> 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.



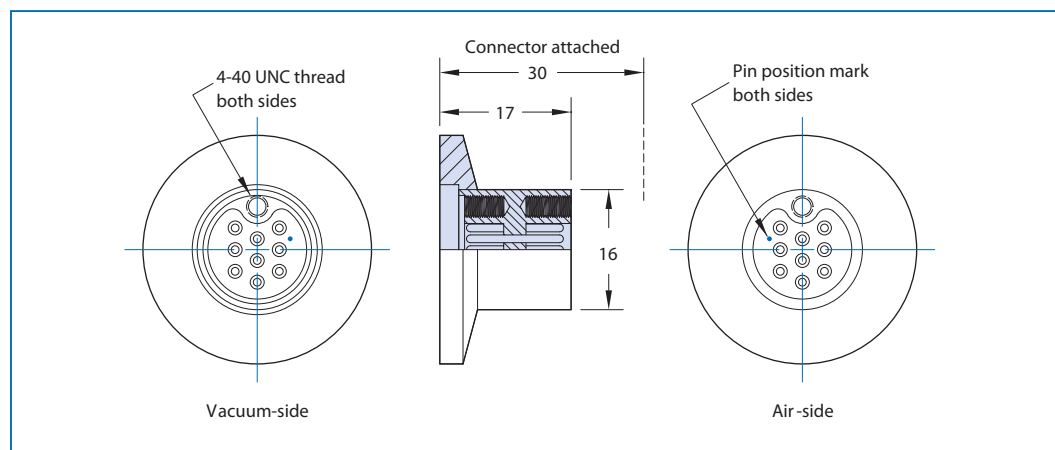
### HV KF Flange with 9 pins

No. of pins	Flange	Description	Reference	Part number
9	KF16	Feedthrough, vacuum cable and air-side connector <sup>1</sup>	C9KIT-K16	<b>1512605</b>
9	KF16	Feedthrough only <sup>2</sup>	C9-K16	<b>1512601</b>

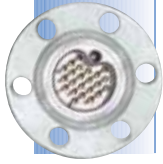
<sup>1</sup> Contains air and vacuum-side connectors with 96inch **2438mm** and 19inch **482mm** cable lengths respectively.

<sup>2</sup> 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

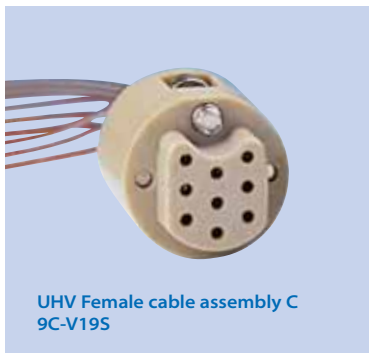
## Air-UHV Multipin accessories 9 pins



Air Female cable assembly C9-A48S



UHV Male cable assembly C9C-V19P



UHV Female cable assembly C9C-V19S



UHV Cable with female contacts C9C-V19CS



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

### Air-service cable assemblies

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

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 Cable assemblies Kapton® insulated

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

<sup>1</sup> 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.

<sup>2</sup> **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.**

<sup>3</sup> 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 250°C.

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

All dimensions are nominal in millimetres unless specified.

# Subminiature-C

## Air-UHV Multipin accessories 9 pins



### UHV Ribbon cable assemblies Kapton® insulated

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

<sup>1</sup> 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.

<sup>2</sup> **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 250°C.

### UHV Ribbon extension cables Kapton® insulated

Type	Cable length	Reference	Part number
<b>Connector fitted</b>			
UHV	500	SMCAB-C9UHV-500	<b>1608021</b>
UHV	1000	SMCAB-C9UHV-1000	<b>1608023</b>

<sup>1</sup> Each cable is fitted with male and female 9 way Subminiature-C connectors.

All UHV cable assemblies are bakeable to 250°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-VCP	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							
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-C

## 23 pins



### 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**<sup>1</sup>  
23 pin 300VDC maximum

**Current**<sup>1</sup>  
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  $1 \times 10^{-10}$  mbar  
HV  $1 \times 10^{-8}$  mbar

**Temperature range**<sup>2</sup>  
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

<sup>1</sup> See intended operating conditions in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

### UHV and HV series

#### CF Mount

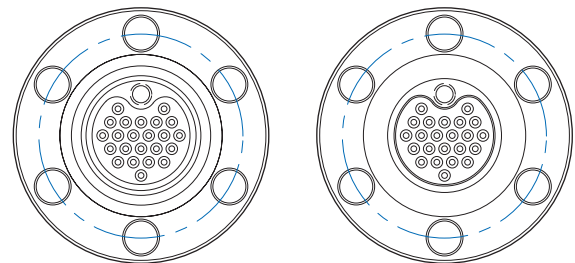
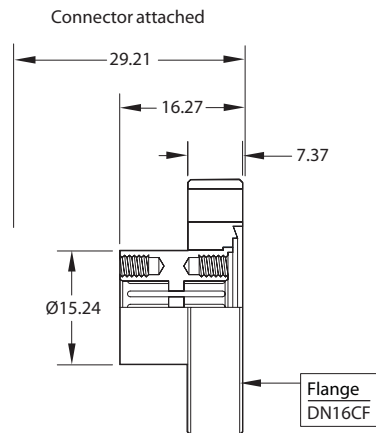


Fig 1

**End views** Air and vacuum-side

#### ISO KF Mount

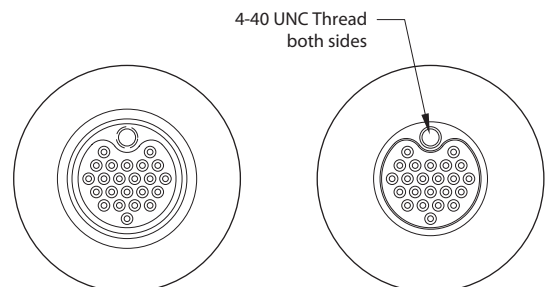
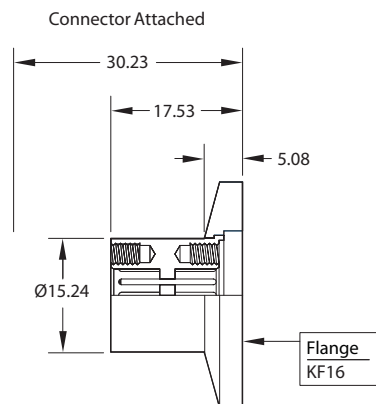


Fig 2

**End views** Air and vacuum-side



### CF



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

### ISO KF



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

### Accessories



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

Accessory type	Length ins mm	Reference	Part number
Vacuum-side connector and cable assembly	19" <b>482</b>	C23-VACCB19	<b>9924079</b>
Air-side connector and cable assembly	96" <b>2438</b>	C23-AIRCB96	<b>9324086</b>



All dimensions are nominal in millimetres unless specified.

# Subminiature-C

## 37 pins

### CF



DN40CF

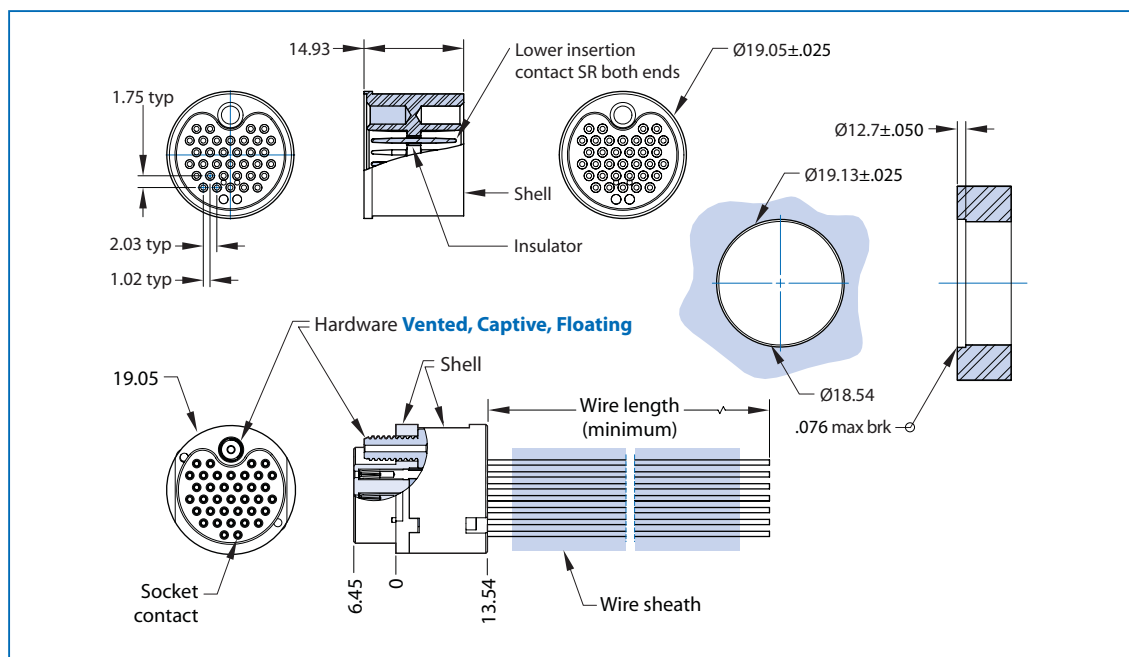


No. of pins	Flange	Description	Reference	Part number
37	DN40CF	Feedthrough, vacuum cable and air-side connector kit <sup>1</sup>	C37KIT-C40	<b>1520100</b>
37	DN40CF	Feedthrough only <sup>2</sup>	C37-C40	<b>1520110</b>

<sup>1</sup> Contains air and vacuum-side connectors with 96 inch **2438mm** and 19 inch **482mm** cable lengths respectively.

<sup>2</sup> 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



KF50

No. of pins	Flange	Description	Reference	Part number
37	KF40	Feedthrough, vacuum cable and air-side connector kit <sup>1</sup>	C37KIT-K40	<b>1520101</b>
37	KF40	Feedthrough only <sup>2</sup>	C37-K40	<b>1520111</b>

<sup>1</sup> Contains air and vacuum-side connectors with 96 inch **2438mm** and 19 inch **482mm** cable lengths respectively.

<sup>2</sup> 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	–	UHV Vacuum PEEK® Connector - female	C37-VCS	<b>1520104</b>
37	–	Air-side Delrin® Connector - female	C37-ACS	<b>1520103</b>
–	–	Female crimps pack 25	CPIN-FC-23	<b>1520002</b>

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

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





### CF



DN40CF

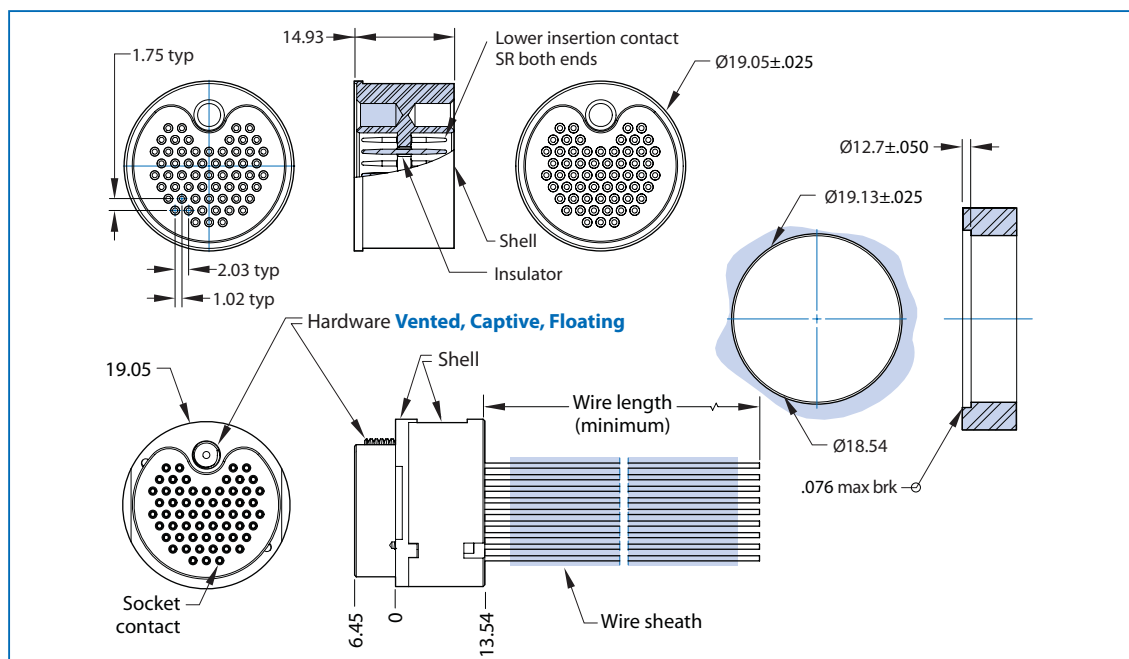


No. of pins	Flange	Description	Reference	Part number
60	DN40CF	Feedthrough, vacuum cable and air-side connector kit <sup>1</sup>	C60KIT-C40	<b>1520200</b>
60	DN40CF	Feedthrough only <sup>2</sup>	C60-C40	<b>1520210</b>

<sup>1</sup> Contains air and vacuum-side connectors with 96 inch **2438mm** and 19 inch **482mm** cable lengths respectively.

<sup>2</sup> 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



KF50

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

<sup>1</sup> Contains air and vacuum-side connectors with 96 inch **2438mm** and 19 inch **482mm** cable lengths respectively.

<sup>2</sup> 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	–	UHV Vacuum PEEK® Connector - female	C60-VCS	<b>1520204</b>
60	–	Air-side Delrin® Connector - female	C60-ACS	<b>1520203</b>
–	–	Female crimps pack 25	CPIN-FC-23	<b>1520002</b>

Accessory type	Length ins mm	Reference	Part number
Vacuum-side connector and cable assembly	19" <b>482</b>	C60-VACCAB19	<b>1520231</b>
Air-side connector and cable assembly	96" <b>2438</b>	C60-AIRCAB96	<b>1520230</b>

All dimensions are nominal in millimetres unless specified.



# Subminiature-D

## 9, 15, 25 and 50 pins

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.



Custom feedthrough

### 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** <sup>1</sup> 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 <sup>2</sup> Delrin®/PEEK®

#### Vacuum range

UHV/HV 1x10<sup>-10</sup> mbar/1x10<sup>-8</sup> mbar

#### Temperature range

<sup>3</sup>

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

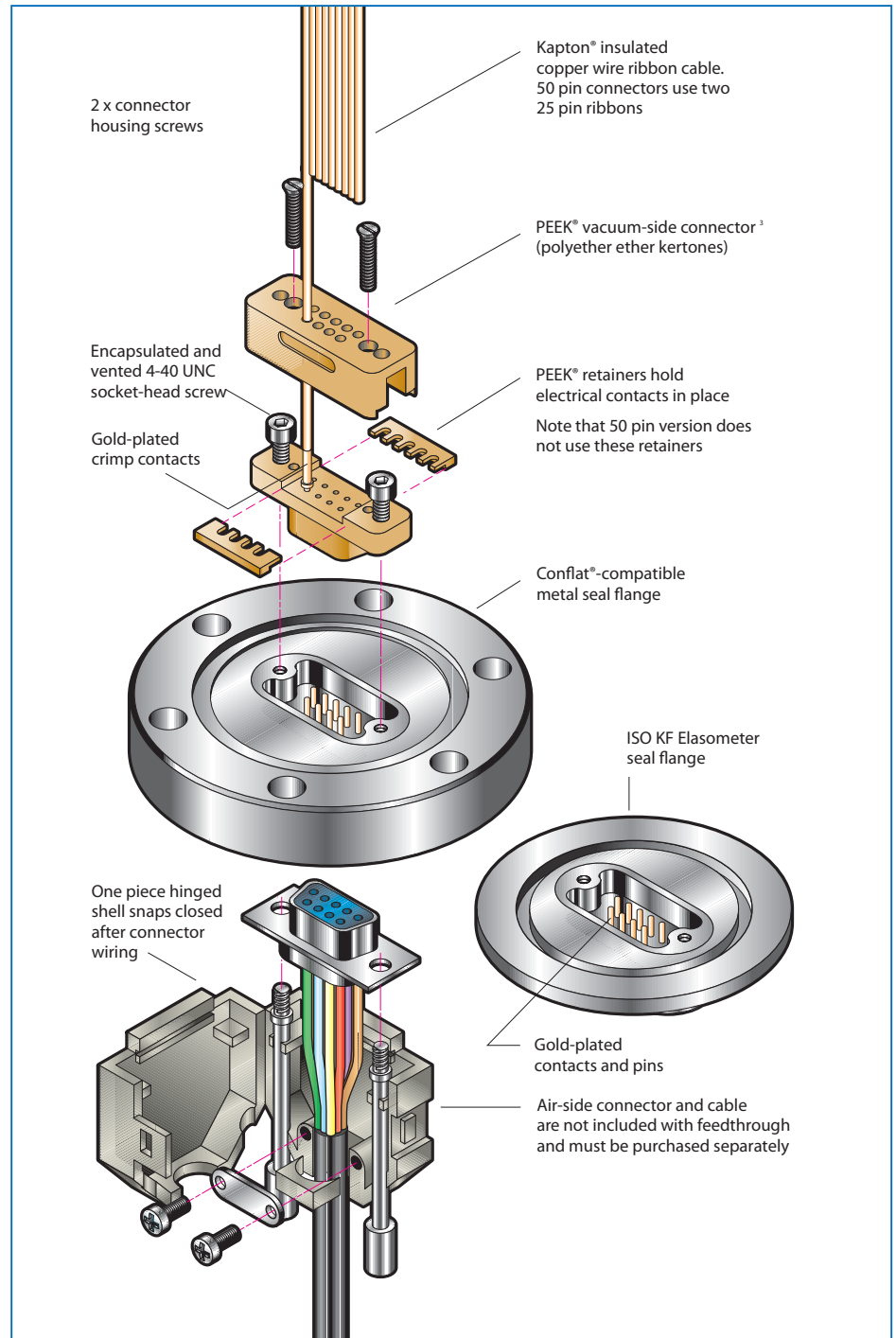
Vacuum-side connector -200°C to 250°C

**Dimensions** Reference only subject to change

<sup>1</sup> Electrical ratings are maximum test values  
Feedthroughs are intended for instrumentation applications carrying low level signal voltages and currents

<sup>2</sup> PEEK® is a Polyether ether ketone thermoplastic  
Delrin® is an acetyl homopolymer

<sup>3</sup> Overall assembly ratings must be adjusted to that of the lowest rated component



All dimensions are nominal in millimetres unless specified.

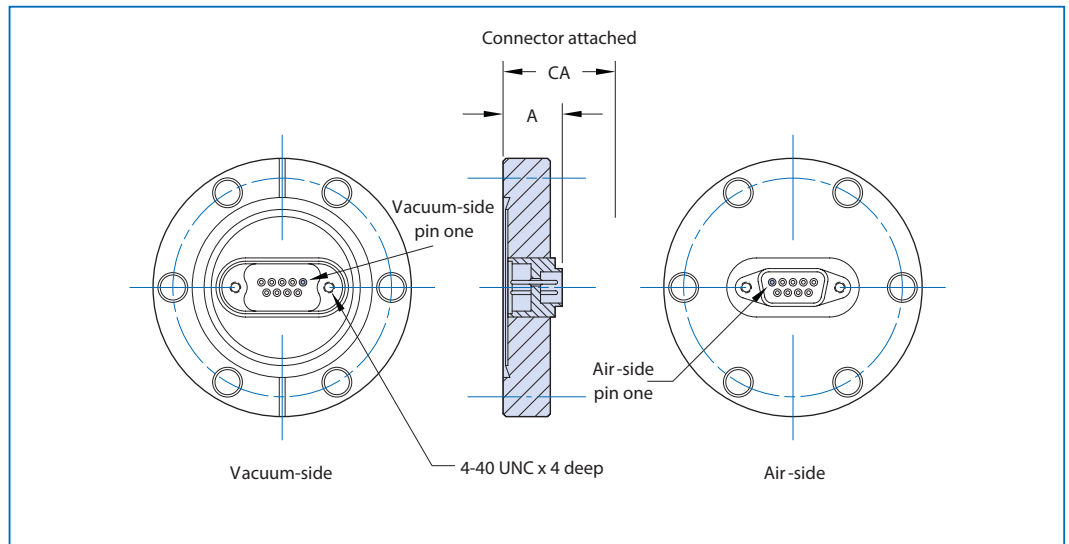
# Subminiature-D 9, 15, 25 and 50 pins



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

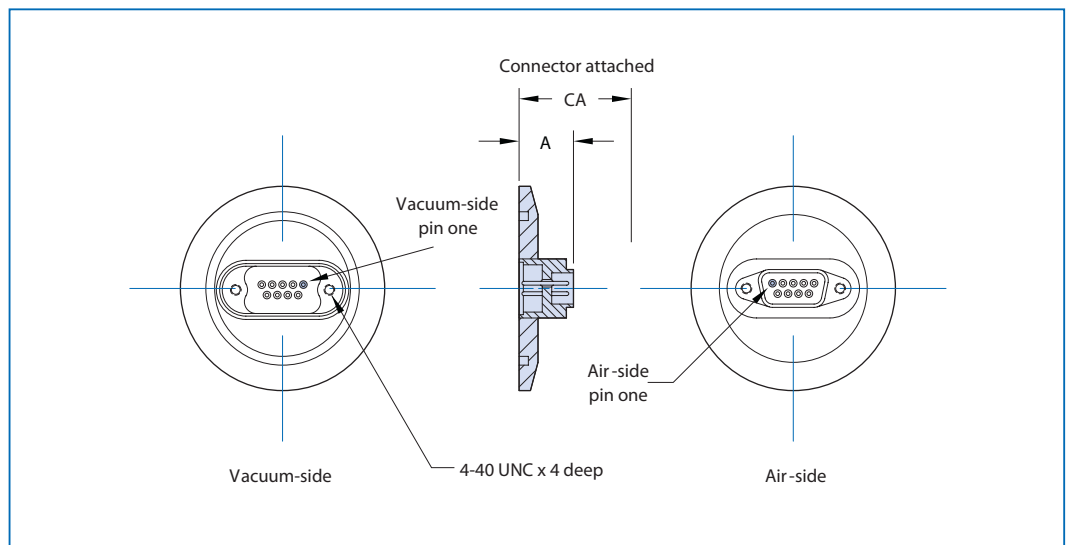
No. of pins	Flange	A	CA	Reference	Part number
9	DN40CF	15	65	D9-C40	1511000
15	DN63CF	15	69	D15-C63	1511001
25	DN63CF	15	69	D25-C63	1511002
50	DN100CF	20	69	D50-C100	1511007

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



## HV 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	KF50	15	64	D15-K50	1511021
25	ISO63	15	64	D25-L63	1511022
50	ISO100	15	64	D50-L100	1511008



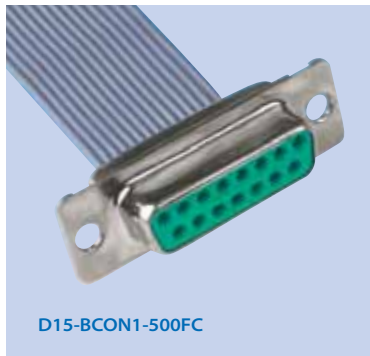
All dimensions are nominal in millimetres unless specified.





# Subminiature-D

## 9, 15, 25 and 50 pins



### HV PTFE Ribbon cable assemblies

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

Each wire is constructed of 7 each 0.3mm 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
<b>High vacuum connectors</b>							
9	Male	33	19	13	1510114	D9-BCON1M	<b>1510006</b>
15	Male	42	19	13	1510114	D15-BCON1M	<b>1510007</b>
25	Male	56	19	13	1510114	D25-BCON1M	<b>1510008</b>
50	Male	67	19	13	151011	D50-BCON1M	<b>1510009</b>
9	Female	33	19	13	1510113	D9-BCON1F	<b>1510000</b>
15	Female	42	19	13	1510113	D15-BCON1F	<b>1510001</b>
25	Female	56	19	13	1510113	D25-BCON1F	<b>1510002</b>
50	Female	67	19	13	1510113	D50-BCON1F	<b>1510003</b>
<b>Air service connectors</b>							
9	Female	33	19	13	Included	D9-AC	<b>1510990</b>
15	Female	42	19	13	Included	D15-AC	<b>1510991</b>
25	Female	56	19	13	Included	D25-AC	<b>1510992</b>
50	Female	67	19	13	Included	D50-AC	<b>1510993</b>
1 pack Contact Male contacts 25 pieces per pack						DPIN-MPOS	<b>1510114</b>
1 pack Contact Female contacts 25 pieces perpack						DPIN-FPOS	<b>1510113</b>
Crimping tool for male and female contacts						DCT-POS1	<b>1510115</b>

Vacuum connectors do not include contacts which must be purchased separately.

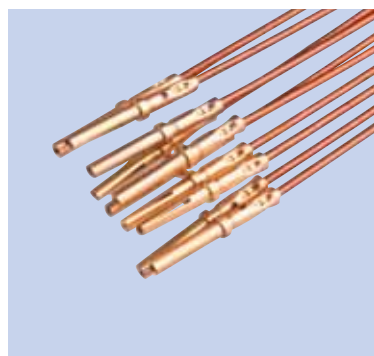
These connectors and contacts will mate with 1 mm pin diameters.

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



### UHV PEEK® Ribbon cable assemblies

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

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.

<sup>1</sup> **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, 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	<b>1510020</b>
15	Male	42	19	13	1510101	D15-BCON2M	<b>1510021</b>
25	Male	56	19	13	1510101	D25-BCON2M	<b>1510022</b>
50	Male	67	19	13	1510101	D50-BCON2M	<b>1510023</b>
9	Female	33	19	13	1510100	D9-BCON2F	<b>1510010</b>
15	Female	42	19	13	1510100	D15-BCON2F	<b>1510011</b>
25	Female	56	19	13	1510100	D25-BCON2F	<b>1510012</b>
50	Female	67	19	13	1510100	D50-BCON2F	<b>1510013</b>
1 pack Contact Male contacts						25 pieces per package	DPINMC <b>1510101</b>
1 pack Contact Female contacts						25 pieces per package	DPINFC <b>1510100</b>
Crimping tool for male and female contacts						DCT1	<b>1512056</b>

Connectors do not include contacts which must be purchased separately.

These connectors and contacts will mate with 0.04 inches **1 mm** pin diameters.



# Power Subminiature-D

## 3, 5 and 8 pins



### 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 feedthrough 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 <sup>1</sup>
--------	-------------------

#### Vacuum range

UHV (CF)	1 x 10 <sup>-10</sup> mbar
HV (KF)	1 x 10 <sup>-8</sup> mbar

#### Temperature range<sup>2</sup>

Feedthrough – CF	-200°C to +250°C
Feedthrough – KF	-20°C to +160°C
Connector – Air	-20°C to +60°C
Connector – Vacuum	-200°C to +250°C
Thermal gradient	25°C per minute max.

<sup>1</sup> PEEK<sup>®</sup> is a Polyether-Etherketone thermoplastic.

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component.

### UHV and HV series

#### CF Mount

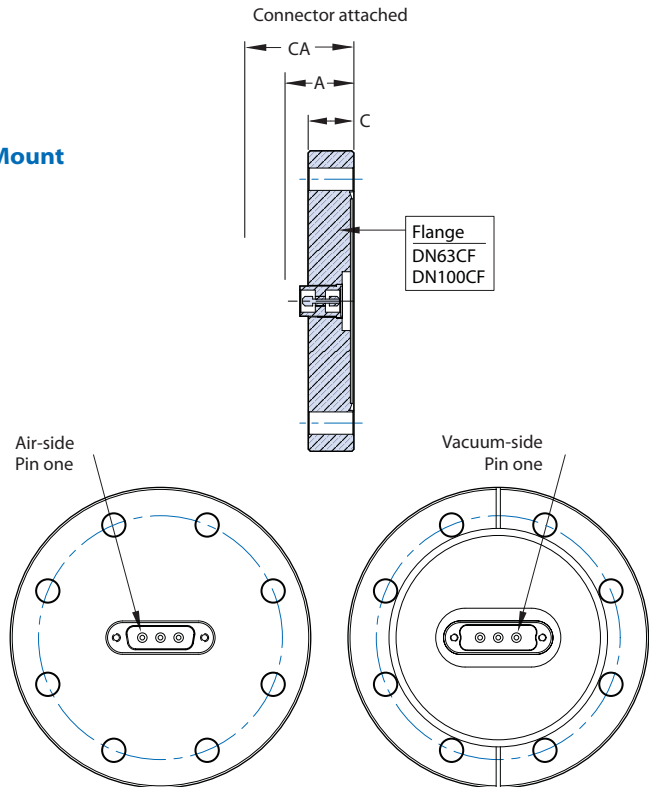
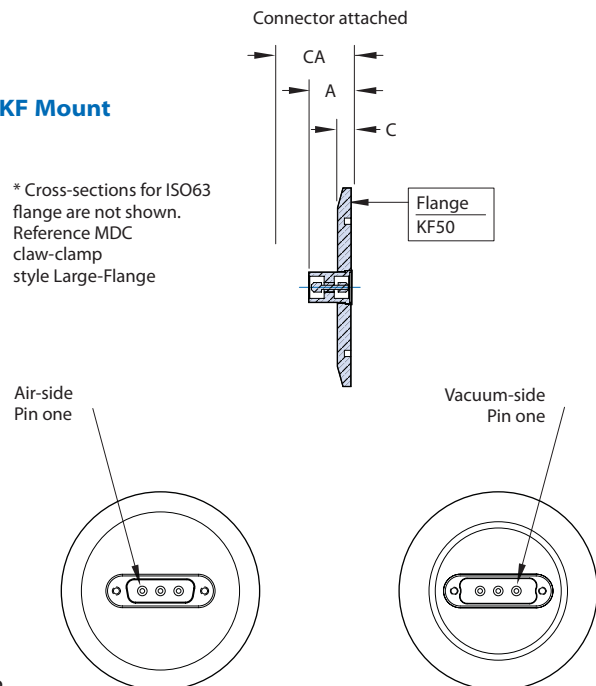


Fig 1

End views Air and vacuum-side

#### ISO KF Mount



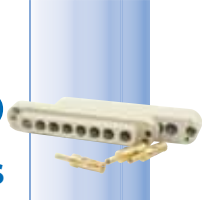
\* Cross-sections for ISO63 flange are not shown. Reference MDC claw-clamp style Large-Flange

Fig 2

End views Air and vacuum-side

# 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	<b>9132020</b>
5	DN63CF	1	17.5	20.3	70	PD5-C63	<b>9132021</b>
8	DN100CF	1	19.8	221.1	70	PD8-C100	<b>9132022</b>

### 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	<b>9133020</b>
5	ISO63	-	16	12	65	PD5-L63	<b>9133021</b>
8	ISO100	-	16	12	65	PD8-L100	<b>9133022</b>

### Accessories



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



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

All dimensions are nominal in millimetres unless specified.



# Double Density Subminiature-D

## UHV and HV series



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 feedthrough configurations available on request

### Specifications

<b>Voltage</b>	1000 VDC maximum <sup>1</sup>
<b>Current</b>	10 Amperes maximum at 20°C
Per pin amperage	10 Amps per pin <sup>1</sup>
Shell	Stainless Steel
Pins	BeCu gold plated
Seal/Insulation	Ceramic/PEEK <sup>2</sup>
<b>Vacuum range</b>	
UHV (CF)	1 x10 <sup>-10</sup> mbar
HV (KF)	1 x10 <sup>-8</sup> mbar
<b>Temperature range</b> <sup>3</sup>	
UHV	-200°C to +250°C
HV	-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.

<sup>1</sup> 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).

<sup>2</sup> PEEK® is a Polyether-Etherketone thermoplastic.

<sup>3</sup> Overall assembly ratings must be adjusted to that of the lowest rated component.

### CF Mount

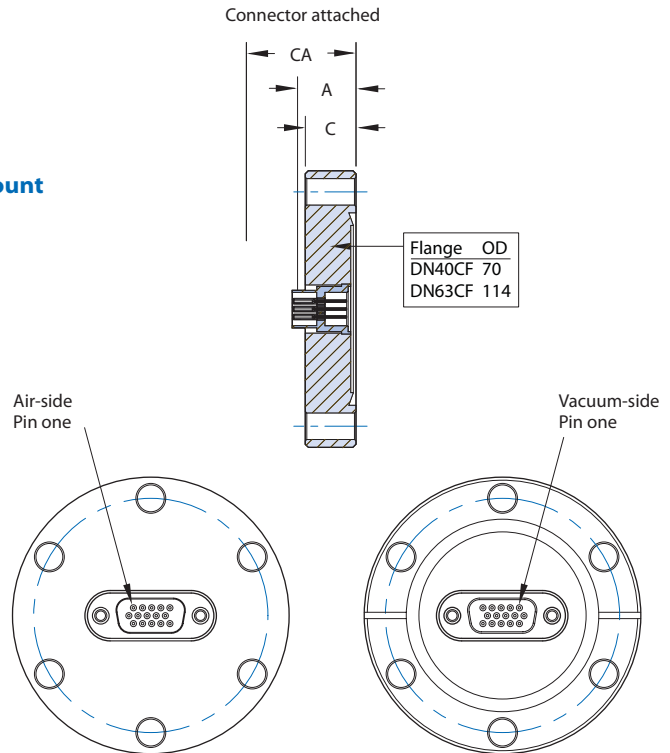


Fig 1

End views Air and vacuum-side

### ISO KF Mount

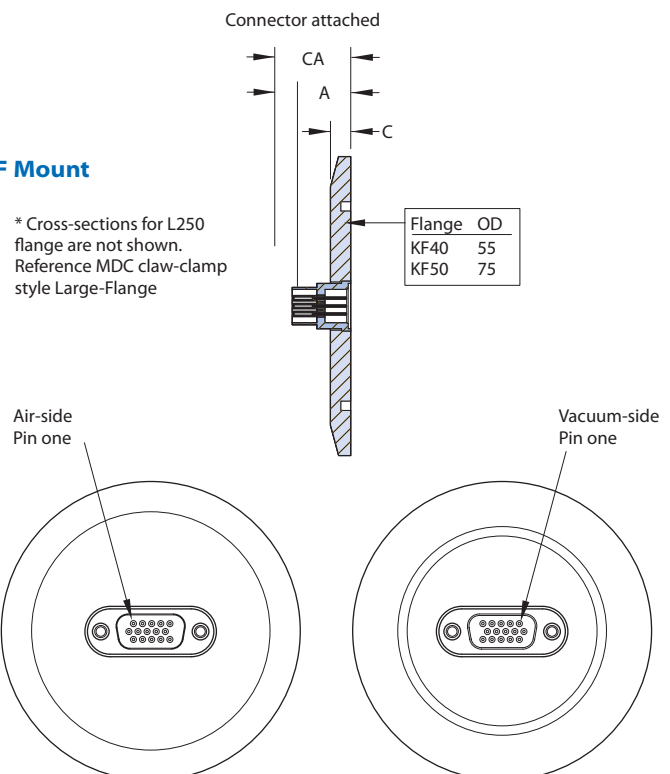


Fig 2

End views Air and vacuum-side

All dimensions are nominal in millimetres unless specified.



## CF



No. of pins	CF Flange	Fig.	Dim A	Dim C	Dim CA	Reference	Part number
15	DN40CF	1	16	12.7	22.3	DD15-C40	<b>9162006</b>
26	DN63CF	1	17.5	17.2	23.6	DD26-C63	<b>9162007</b>
44	DN63CF	1	17.5	17.2	23.6	DD44-C63	<b>9162008</b>

## ISO KF/LF



No. of pins	KF/ISO Flange	Fig.	Dim A	Dim C	Dim CA	Reference	Part number
15	KF40	2	14.7	5.1	22.3	DD15-K40	<b>9163006</b>
26	KF50	2	14.7	5.1	23.6	DD26-K50	<b>9163007</b>
44	ISO63	-	14.7	5.1	23.6	DD44-L63	<b>9163008</b>

## Accessories



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

All dimensions are nominal in millimetres unless specified.



# Micro-D Instrumentation

9, 15, 25, 51 and 100 pins



## 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 feedthrough configurations available on request

## Specifications

<b>Voltage</b> <sup>1</sup>	300V DC maximum
<b>Current</b> <sup>2</sup>	3A max per pin
<b>Material</b>	
Shell	Stainless Steel
Pins	BeCu gold plated
Seal/Insulation	Ceramic
<b>Connector</b>	
Vacuum	PEEK® <sup>2</sup>
<b>Vacuum range</b>	
UHV (CF)	1 x10 <sup>-10</sup> mbar
HV (KF)	1 x10 <sup>-8</sup> mbar
<b>Temperature range</b> <sup>3</sup>	
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.

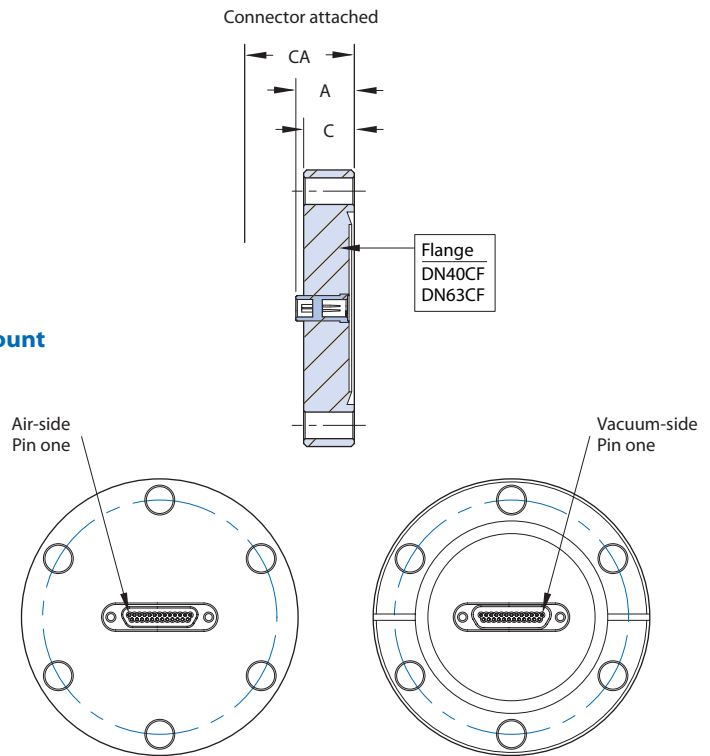
<sup>1</sup> Electrical ratings are maximum test values. Feedthroughs are intended for instrumentation applications carrying low level signal voltages and currents. Current ratings shown are maximum per pin (and maximum per feedthrough).

<sup>2</sup> PEEK® is a Polyether-Etherketone thermoplastic.

<sup>3</sup> Overall assembly ratings must be adjusted to that of the lowest rated component.

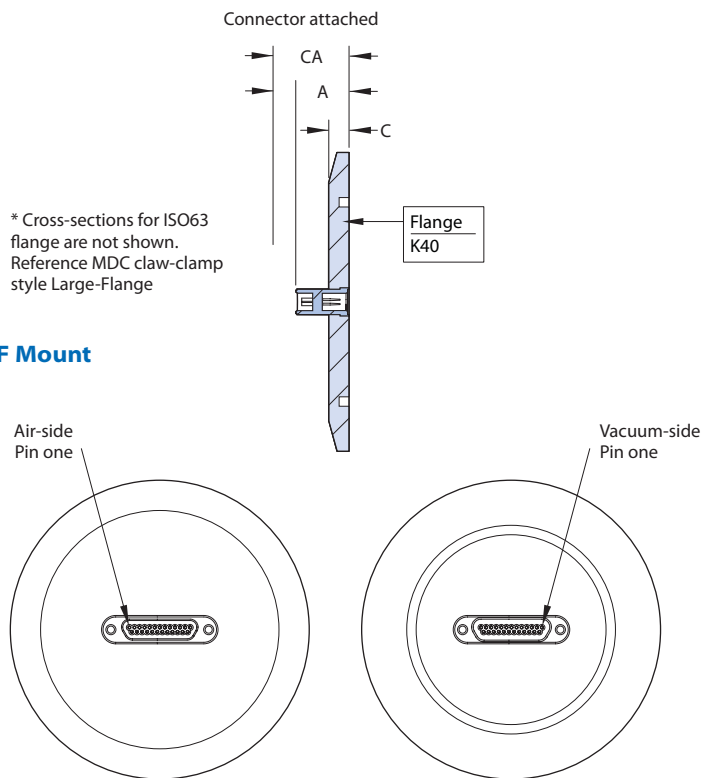
## UHV and HV series

### CF Mount



### End views Air and vacuum-side

### ISO KF Mount



### 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	<b>9162001</b>
15	DN40CF	1	14.7	12.7	20.5	MD15-C40	<b>9162002</b>
25	DN40CF	1	14.7	12.7	20.5	MD25-C40	<b>9162003</b>
51	DN40CF	1	14.7	12.7	20.5	MD51-C40	<b>9162004</b>
100	DN63CF	1	17.5	17.4	23.6	MD100-C63	<b>9162005</b>

### 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	<b>9163001</b>
15	KF40	2	13.5	5	19.1	MD15-K40	<b>9163002</b>
25	KF40	2	13.5	5	19.1	MD25-K40	<b>9163003</b>
51	KF40	2	13.5	5	19.1	MD51-K40	<b>9163004</b>
100	ISO63	-	13.5	12	19.1	MD100-L63	<b>9163005</b>

### Accessories – air + side connector kits



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

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





# USB Instrumentation

4 pins



## Features

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

## Specifications

<b>Voltage</b>	Instrumentation
<b>Material</b>	
Shell	Stainless Steel 304
Pins	BeCu gold plated
Seal/Insulation	Ceramic/PBT
<b>Connector</b>	
Vacuum	SS/PEEK <sup>1</sup>
<b>Vacuum range</b>	
UHV (CF)	1 x 10 <sup>-10</sup> mbar
HV (KF)	1 x 10 <sup>-8</sup> mbar
<b>Temperature range</b>	
Feedthrough – CF	-200°C to +160°C
Feedthrough – KF	-20°C to +160°C
Connector vacuum	-200°C to +250°C

<sup>1</sup> PEEK® is a Polyether-Etherketone thermoplastic.

## UHV and HV series

### CF Mount

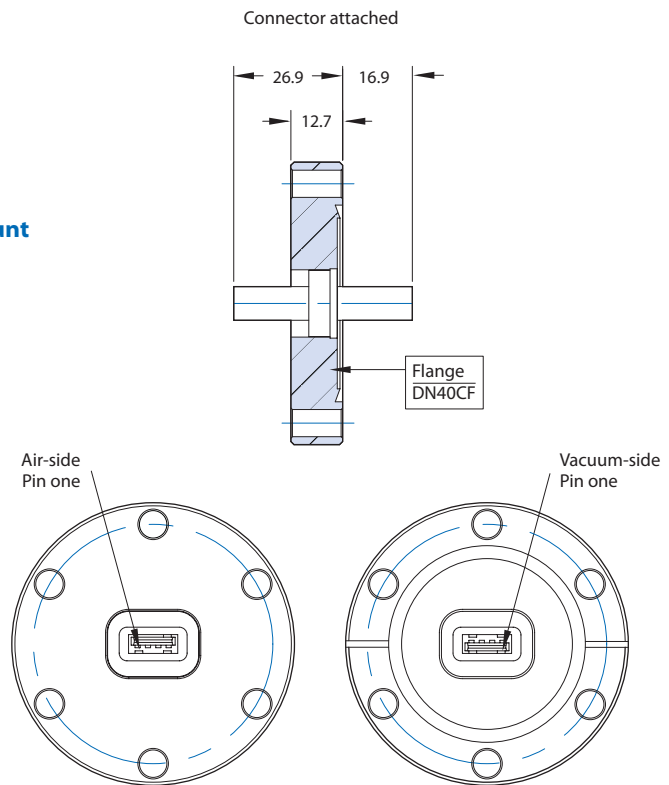


Fig 1

**End views** Air and vacuum-side

### ISO KF Mount

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

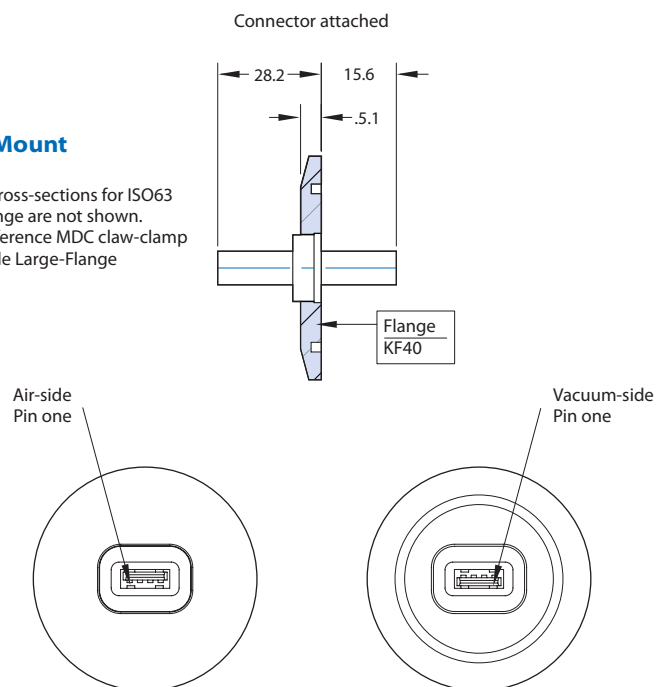


Fig 2

**End views** Air and vacuum-side

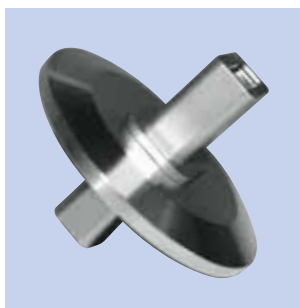


## CF



Number of pins	Flange	Description	Reference	Part number
4	DN40CF	USB 2.0 Feedthrough	USB-C40	<b>9172001</b>

## ISO KF



Number of pins	Flange	Description	Reference	Part number
4	KF40	USB 2.0 Feedthrough	USB-K40	<b>9173001</b>

## Accessories



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



## Section 6.2

# BNC Coaxial

Grounded shield / single ended



### Features

- Noise shield for instrumentation transmission
- Bayonet-style threadless connection
- Air-side connector included
- In-vacuum cables available
- Three standard vacuum mounting styles
- Custom feedthrough configurations available upon request

### Specifications

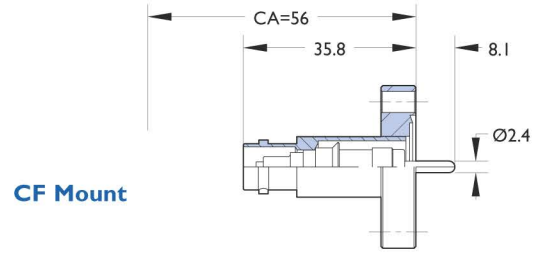
<b>Voltage<sup>1</sup></b>	500V DC maximum
<b>Current</b>	3A
<b>Impedance rating</b>	Non constant
<b>Material</b>	
Flanges	304ss
Shell	304ss
Pins	304ss
Insulation	Alumina ceramic
<b>Vacuum range UHV/HV</b>	$1 \times 10^{-10}$ mbar / $1 \times 10^{-8}$ mbar
<b>Temperature range<sup>2</sup></b>	
CF Mounted feedthrough	-200°C to 450°C
ISO KF Mounted feedthrough	-20°C to 150°C
Weldable feedthrough	-200°C to 450°C
Air-side connector	-65°C to 165°C
<b>Dimensions</b>	Reference only, subject to change

<sup>1</sup> See intended operating parameters in introductory section.

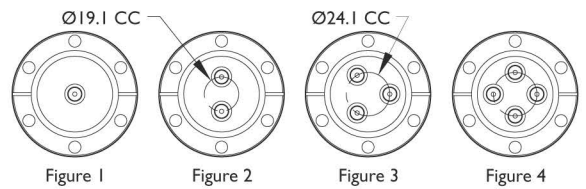
<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component.

## Feedthroughs – electrical and optical

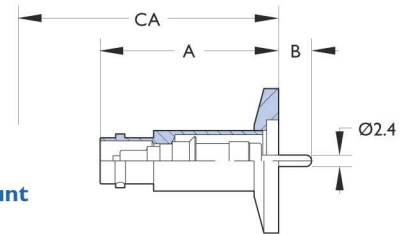
### UHV and HV series



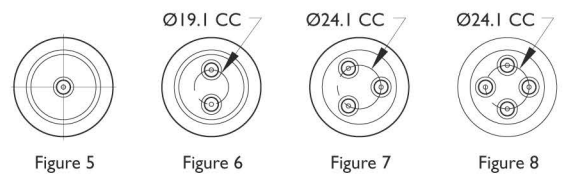
CF Mount



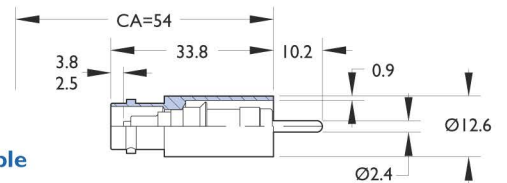
End views Vacuum-side



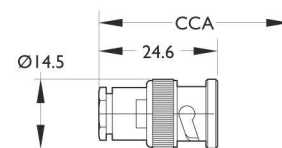
ISO KF Mount



End views Vacuum-side



Weldable



Air-side connector

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

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CF



No. of pins	Flange mount	End view	Reference	Part number
1	DN16CF	1	BNC-C16	9212000
1	DN40CF	1	BNC-C40	9212001
2	DN40CF	2	BNC-2-C40	9212002
3	DN40CF	3	BNC-3-C40	9212003
4	DN40CF	4	BNC-4-C40	9212004

Air-side connector included at no extra cost

ISO KF



No. of pins	Flange mount	End view	A	B	CA	Reference	Part number
1	DN16KF	5	37.1	6.9	57	BNC-K16	9213000
1	DN40KF	5	34.5	9.4	54	BNC-K40	9213001
2	DN40KF	6	34.5	9.4	54	BNC-2-K40	9213002
3	DN50KF	7	34.5	9.4	54	BNC-3-K50	9213003
4	DN50KF	8	34.5	9.4	54	BNC-4-K50	9213004

Air-side connector included at no extra cost

Weldable



Mount type	Mount diameter	CA	Reference	Part number
Single ended	–	–	BNC	9211000

Air-side connector included at no extra cost

 Part numbers printed in light blue indicate products that are suitable for -200°C cryogenic applications

Accessories



Description	Termination type	Cable length	Reference	Part number
Coaxial cable assembly	Grounded	500	KAP50-GS-500	1512507
Coaxial cable assembly	Grounded	1000	KAP50-GS-1000	1512508
Coaxial cable assembly	Floating	500	KAP50-FS-500	1512505
Coaxial cable assembly	Floating	1000	KAP50-FS-1000	1512506

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





## Section 6.2

# BNC Coaxial

Grounded shield / double ended



## Features

- Noise shield for instrumentation transmission
- Bayonet-style threadless connection
- Air-side connector included
- In-vacuum cables available
- Three standard vacuum mounting styles
- Custom feedthrough configurations available upon request

## Specifications

**Voltage<sup>1</sup>** 500V DC maximum

**Current** 3A

**Impedance rating** Non constant

### Material

Flanges 304ss

Shell 304ss

Pins 304ss

Insulation Alumina ceramic

**Vacuum range** UHV/HV  $1 \times 10^{-10}$  mbar /  $1 \times 10^{-8}$  mbar

### Temperature range<sup>2</sup>

CF Mounted feedthrough -200°C to 450°C

ISO KF Mounted feedthrough -20°C to 150°C

Weldable feedthrough -200°C to 450°C

Air-side connector -65°C to 165°C

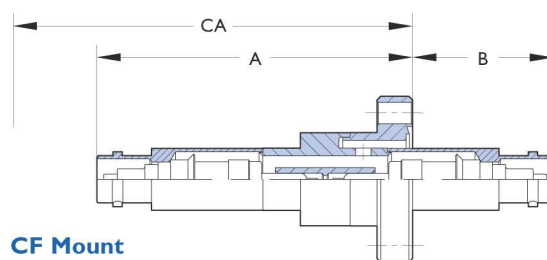
**Dimensions** Reference only, subject to change

<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

## Feedthroughs – electrical and optical

## UHV and HV series



CF Mount

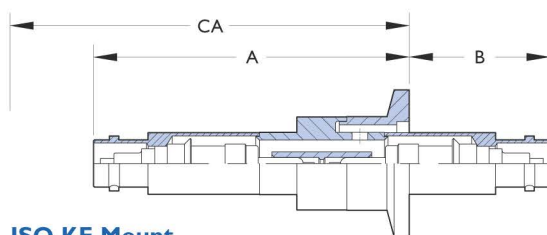


Figure 1



Figure 2

**End views** Vacuum-side



ISO KF Mount



Figure 3

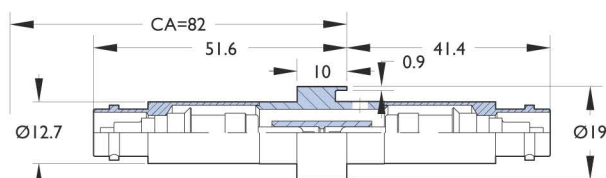


Figure 4

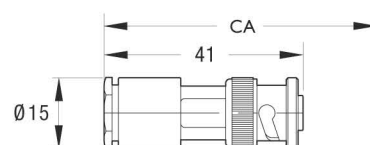


Figure 5

**End views** Vacuum-side



**Weldable**



**Air-side connector**

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BNC Coaxial

Grounded shield / double ended



BNC Coaxial

CF



No. of pins	Flange mount	End view	A	B	CA	Reference	Part number
1	DN16CF	1	64	29	84	BNCD-C16	9212005
1	DN40CF	1	54	39	74	BNCD-C40	9212006
2	DN40CF	2	54	39	74	BNCD-2-C40	9212007

Air-side connector included at no extra cost

ISO KF



No. of pins	Flange mount	End view	A	B	CA	Reference	Part number
1	DN16KF	3	64	29	84	BNCD-K16	9213005
1	DN40KF	3	52	41	72	BNCD-K40	9213006
2	DN50KF	4	52	41	72	BNCD-2-K50	9213007
3	DN50KF	5	52	41	72	BNCD-3-K50	9213008

Air-side connector included at no extra cost

Weldable



Mount type	Reference	Part number
Double ended	BNCD	9211001

Air-side connector included at no extra cost

 Part numbers printed in light blue indicate products that are suitable for -200°C cryogenic applications

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



## Section 6.2

# BNC Coaxial

Floating shield / single and double ended

Feedthroughs – electrical and optical



## Features

- Noise shield for instrumentation transmission
- Bayonet-style threadless connection
- Air-side connector included
- In-vacuum cables available
- Three standard vacuum mounting styles
- Custom feedthrough configurations available upon request

## Specifications

**Voltage<sup>1</sup>** 500V DC maximum

**Current** 3A

**Impedance rating** Non constant

### Material

Flanges 304ss

Shell 304ss

Pins 304ss

Insulation Alumina ceramic

**Vacuum range UHV/HV**  $1 \times 10^{-10}$  mbar /  $1 \times 10^{-8}$  mbar

### Temperature range<sup>2</sup>

CF Mounted feedthrough -200°C to 450°C

ISO KF Mounted feedthrough -20°C to 150°C

Weldable feedthrough -100°C to 450°C

Air-side connector -65°C to 165°C

**Dimensions** Reference only, subject to change

<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

## UHV and HV series

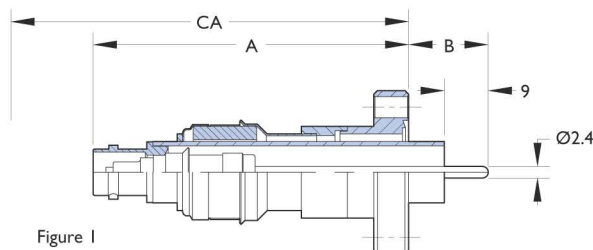


Figure 1

### CF Mount Single ended

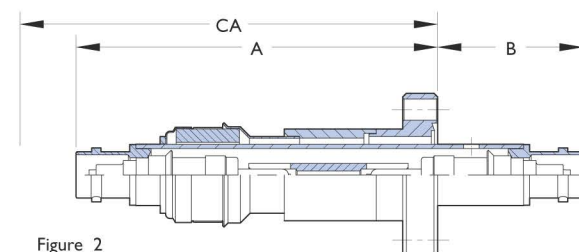


Figure 2

### CF Mount Double ended

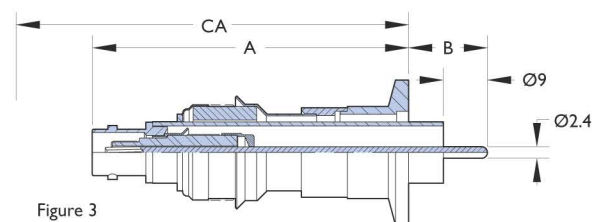


Figure 3

### ISO KF Mount Single ended

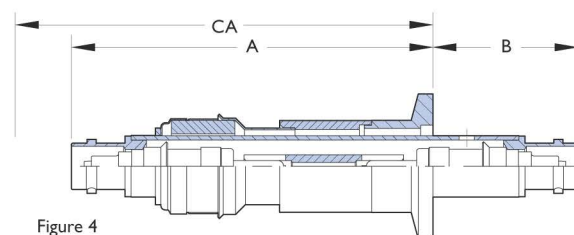


Figure 4

### ISO KF Mount Double ended

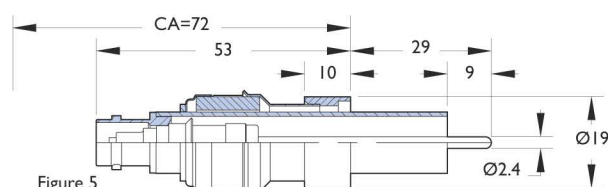


Figure 5

### Weldable Single ended

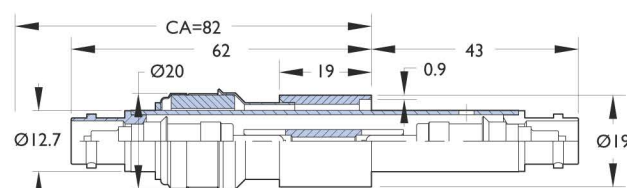


Figure 5

### Weldable Double ended

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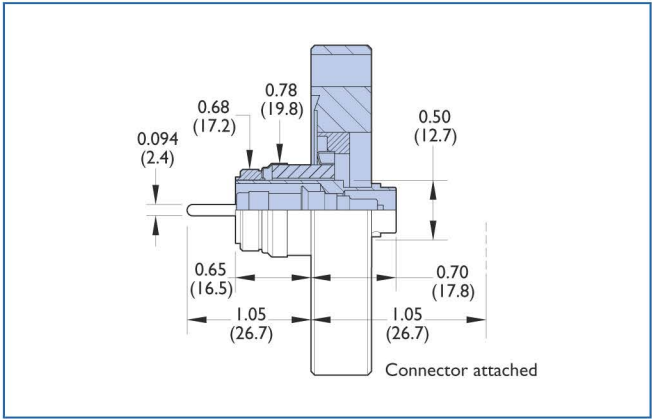
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Floating shield / single and double ended



No. of pins	Flange mount	End view	A	B	CA	Reference	Part number
Single	DN16CF	1	32	17	85	FBNC-C16	9212009
Single	DN40CF	1	55	27	75	FBNC-C40	9212010
Double	DN16CF	2	75	30	95	FBNCD-C16	9212011
Double	DN40CF	2	64	40	84	FBNCD-C40	9212012



Air-side connector included at no extra cost.

**Note** The DN16CF feedthrough is not suitable for use with standard floating shield cable assembly use the grounded shield cable assembly. Instead (electrically the cable is the same).



No. of pins	Flange mount	End view	A	B	CA	Reference	Part number
Single	DN16KF	3	63	17	85	FBNC-K16	9213009
Single	DN40KF	3	54	19	23	FBNC-K40	9213010
Double	DN16KF	4	75	30	95	FBNCD-K16	9213011
Double	DN40KF	4	63	42	83	FBNCD-K40	9213012

Air-side connector included at no extra cost

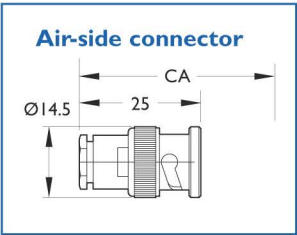


Mount type	Reference	Part number
Single ended	FBNC	9211006
Double ended	FBNCD	9211003

Air-side connector included at no extra cost



Description	Quantity per pack	Reference	Part number
Power push-on	10	PPO-094	9924003
Power in-line	10	PIL-120	9924006



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## Section 6.2

# MHV Coaxial

Grounded shield / single ended

Feedthroughs – electrical and optical



## Features

- Medium power transmission with high-voltage requirements
- Bayonet-style threadless connection
- Air-side connector included
- In-vacuum cables available
- Three standard vacuum mounting styles
- Custom feedthrough configurations available upon request

## Specifications

**Voltage<sup>1</sup>** 5,000V DC maximum

**Current** 3A

**Impedance rating** Non constant

### Material

Flanges 304ss

Shell 304ss

Pins 304ss

Insulation Alumina ceramic

**Vacuum range** UHV/HV  $1 \times 10^{-10}$  mbar /  $1 \times 10^{-8}$  mbar

### Temperature range<sup>2</sup>

CF Mounted feedthrough -200°C to 450°C

ISO KF Mounted feedthrough -20°C to 150°C

Weldable feedthrough -200°C to 450°C

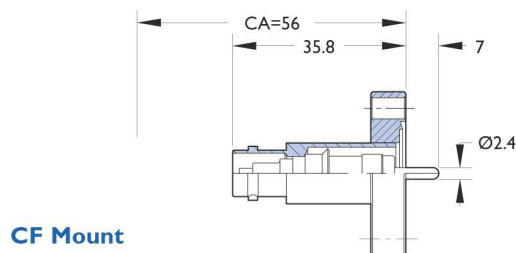
Air-side connector -65°C to 165°C

**Dimensions** Reference only, subject to change

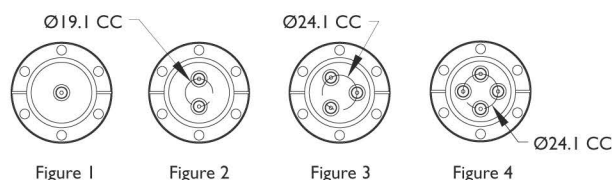
<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

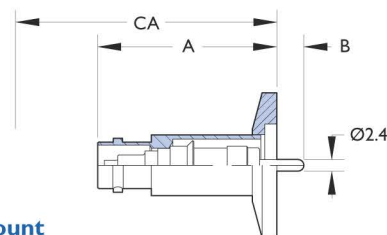
## UHV and HV series



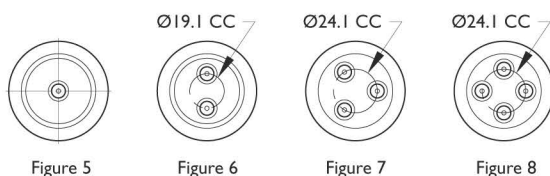
CF Mount



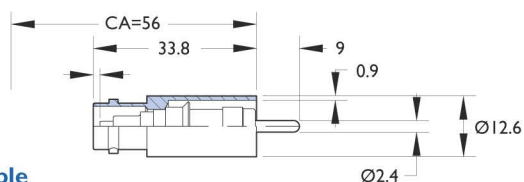
End views Vacuum-side



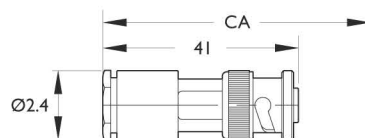
ISO KF Mount



End views Vacuum-side



Weldable



Air-side connector

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

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CF



No. of pins	Flange mount	End view	Reference	Part number
1	DN16CF	1	MHV-C16	9222000
1	DN40CF	1	MHV-C40	9222001
2	DN40CF	2	MHV-2-C40	9222002
3	DN40CF	3	MHV-3-C40	9222003
4	DN40CF	4	MHV-4-C40	9222004

Air-side connector included at no extra cost

ISO KF



No. of pins	Flange mount	End view	A	B	CA	Reference	Part number
1	DN16KF	5	37.1	5.6	67	MHV-K16	9223000
1	DN40KF	5	34.5	8.1	64	MHV-K40	9223001
2	DN40KF	6	34.5	8.1	64	MHV-2-K40	9223002
3	DN50KF	7	34.5	8.1	64	MHV-3-K50	9223003
4	DN50KF	8	34.5	8.1	64	MHV-4-K50	9223004

Air-side connector included at no extra cost

Weldable



Mount type	Reference	Part number
Single ended	MHV	9221000

Air-side connector included at no extra cost

 Part numbers printed in light blue indicate products that are suitable for -200°C cryogenic applications

Accessories



Description	Quantity per pack	Reference	Part number
Power push-on	10	PPO-094	9924003
Power in-line	10	PIL-120	9924006

Description	Termination type	Cable length	Reference	Part number
Coaxial cable assembly	Grounded	500	KAP50-GS-500	1512507
Coaxial cable assembly	Grounded	1000	KAP50-GS-1000	1512508
Coaxial cable assembly	Floating	500	KAP50-FS-500	1512505
Coaxial cable assembly	Floating	1000	KAP50-FS-1000	1512506

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



## Section 6.2

# MHV Coaxial

Grounded shield / double ended

Feedthroughs – electrical and optical



## Features

- Medium power transmission with high-voltage requirements
- Bayonet-style threadless connection
- Air-side connector included
- In-vacuum cables available
- Three standard vacuum mounting styles
- Custom feedthrough configurations available upon request

## Specifications

**Voltage<sup>1</sup>** 5,000V DC maximum

**Current** 3A

**Impedance rating** Non constant

### Material

Flanges 304ss

Shell 304ss

Pins 304ss

Insulation Alumina ceramic

**Vacuum range** UHV/HV  $1 \times 10^{-10}$  mbar /  $1 \times 10^{-8}$  mbar

### Temperature range<sup>2</sup>

CF Mounted feedthrough -200°C to 450°C

ISO KF Mounted feedthrough -20°C to 150°C

Weldable feedthrough -200°C to 450°C

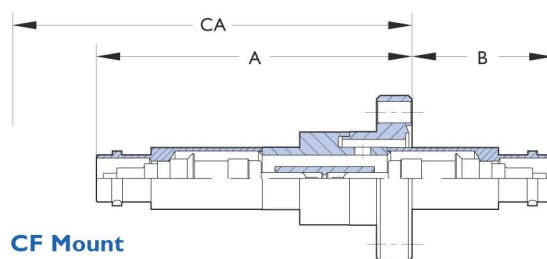
Air-side connector -65°C to 165°C

**Dimensions** Reference only, subject to change

<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

## UHV and HV series



CF Mount

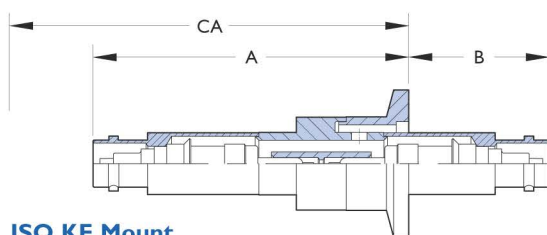


Figure 1



Figure 2

End views Vacuum-side



ISO KF Mount



Figure 3

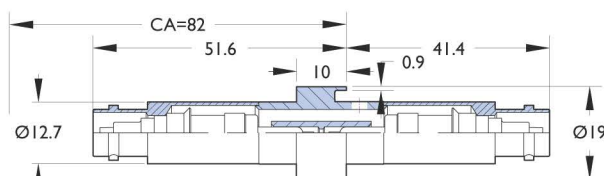


Figure 4

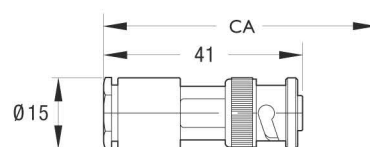


Figure 5

End views Vacuum-side



Weldable



Air-side connector

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CF



No. of pins	Flange mount	End view	A	B	CA	Reference	Part number
1	DN16CF	1	64	29	94	MHVD-C16	9222005
1	DN40CF	1	54	39	83	MHVD-C40	9222006
2	DN40CF	2	54	39	83	MHVD-2-C40	9222007

Air-side connector included at no extra cost

ISO KF



No. of pins	Flange mount	End view	A	B	CA	Reference	Part number
1	DN16KF	3	64	29	94	MHVD-K16	9223005
1	DN40KF	3	52	41	82	MHVD-K40	9223006
2	DN50KF	4	52	41	82	MHVD-2-K50	9223007
3	DN50KF	5	52	41	82	MHVD-3-K50	9223008

Air-side connector included at no extra cost

Weldable



Mount type	Reference	Part number
Double ended	MHVD	9221001

Air-side connector included at no extra cost

 Part numbers printed in light blue indicate products that are suitable for -200°C cryogenic applications





## Features

- Medium power transmission with high-voltage requirements
- Bayonet-style threadless connection
- Air-side connector included
- In-vacuum cables available
- Three standard vacuum mounting styles
- Custom feedthrough configurations available upon request

## Specifications

**Voltage<sup>1</sup>** 5,000V DC maximum

**Current** 3A

**Impedance rating** Non constant

### Material

Flanges 304ss

Shell 304ss

Pins 304ss

Insulation Alumina ceramic

**Vacuum range** UHV/HV  $1 \times 10^{-10}$  mbar /  $1 \times 10^{-8}$  mbar

### Temperature range<sup>2</sup>

CF Mounted feedthrough -100°C to 450°C

ISO KF Mounted feedthrough -20°C to 150°C

Weldable feedthrough -100°C to 450°C

Air-side connector -65°C to 165°C

**Dimensions** Reference only, subject to change

<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

## UHV and HV series

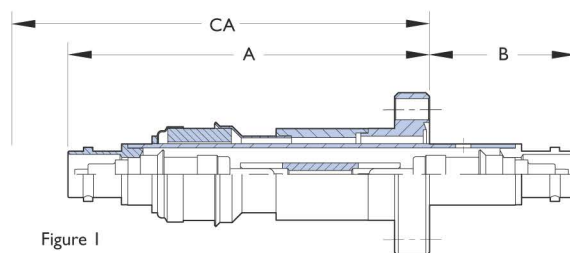


Figure 1

### CF Mount Double ended

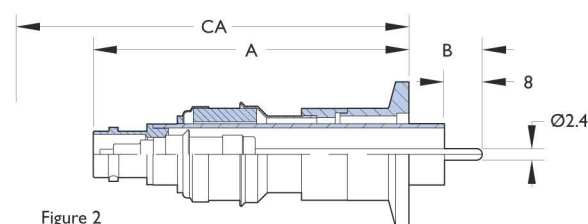


Figure 2

### ISO KF Mount Single ended

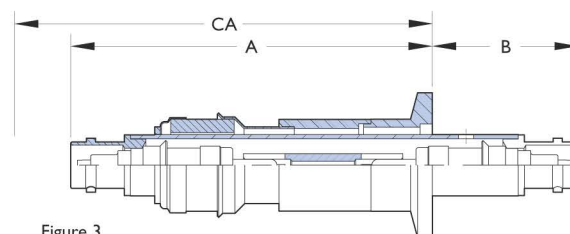


Figure 3

### ISO KF Mount Double ended

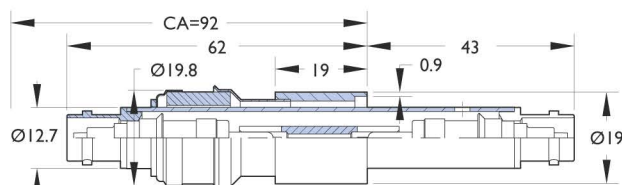


Figure 4

### Weldable Double ended

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

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Floating shield / single and double ended

MHV Coaxial

CF



End type	Flange mount	Figure	A	B	C	CA	Reference	Part number
Single	DN16CF	1	66	16	7	95	FMHV-C16	9922013
Single	DN40CF	1	55	26	13	85	FMHV-C40	9922014
Double	DN16CF	2	75	30	7	105	FMHVD-C16	9222011
Double	DN40CF	2	64	41	13	94	FMHVD-C40	9222012

Air-side connector included at no extra cost

ISO KF



End type	Flange mount	Figure	A	B	CA	Reference	Part number
Single	DN16KF	2	66	16	95	FMHV-K16	9223009
Single	DN40KF	2	54	19	83	FMHV-K40	9223010
Double	DN16KF	3	75	30	105	FMHVD-K16	9223011
Double	DN40KF	3	63	42	93	FMHVD-K40	9223012

Air-side connector included at no extra cost

Weldable



Mount type	Figure	CA	Reference	Part number
Single ended	5	82	FMHV	9221006
Double ended	4	92	FMHVD	9221003

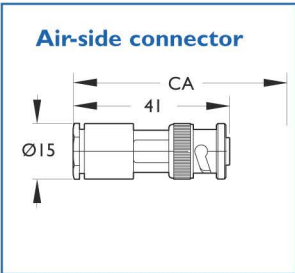
Air-side connector included at no extra cost

 Part numbers printed in light blue indicate products that are suitable for -200°C cryogenic applications

Accessories



Description	Quantity per pack	Reference	Part number
Power push-on	10	PPO-094	9924003
Power in-line	10	PIL-120	9924006



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## Section 6.2

## SHV-5 Coaxial

Exposed



## Features

- Recessed contact design for safe high-voltage connection
- Bayonet-style threadless connection
- Air-side connector included
- Three standard vacuum mounting styles
- Custom feedthrough configurations available upon request

## Specifications

**Voltage<sup>1</sup>** 5,000V DC maximum

**Current** 5A

**Impedance rating** Non constant

## Material

Flanges 304ss

Shell 304ss

Pins Nickel

Insulation Alumina ceramic

**Vacuum range UHV/HV**  $1 \times 10^{-10}$  mbar /  $1 \times 10^{-8}$  mbar

Temperature range<sup>2</sup>

CF Mounted feedthrough -200°C to 450°C

ISO KF Mounted feedthrough -20°C to 150°C

Weldable feedthrough -200°C to 450°C

Air-side connector -65°C to 165°C

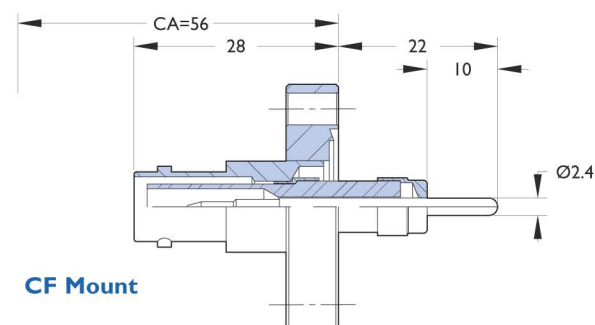
**Dimensions** Reference only, subject to change

<sup>1</sup> See intended operating parameters in introductory section

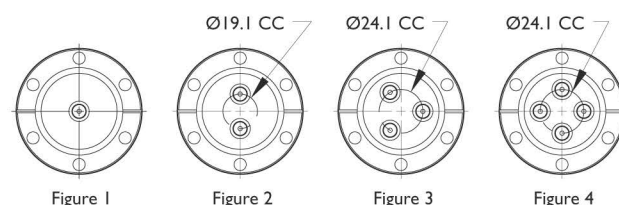
<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

## Feedthroughs – electrical and optical

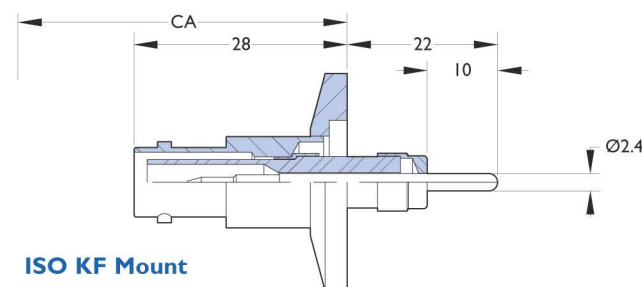
## UHV and HV series



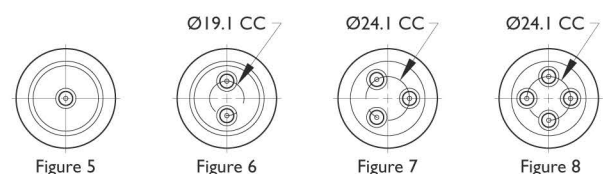
CF Mount



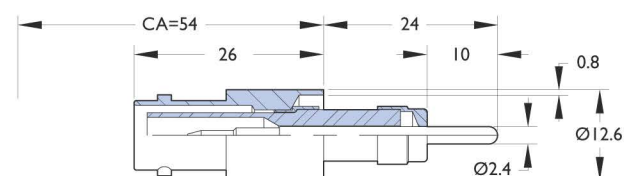
## End views Vacuum-side



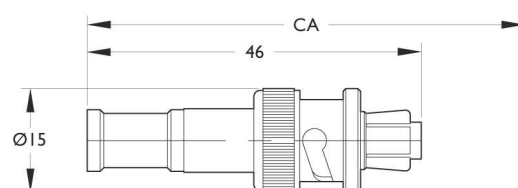
ISO KF Mount



## End views Vacuum-side



Weldable



Air-side connector

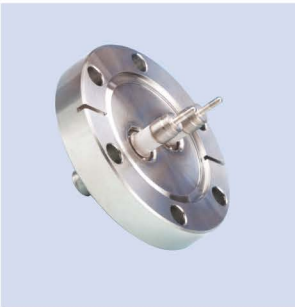
All dimensions are nominal in millimetres unless specified - Weights given are approximate

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CF



No. of pins	Flange mount	End view	Reference	Part number
1	DN16CF	1	SHVE-C16	9232005
1	DN40CF	1	SHVE-C40	9232006
2	DN40CF	2	SHVE-2-C40	9232007
3	DN40CF	3	SHVE-3-C40	9232008
4	DN40CF	4	SHVE-4-C40	9232009

Air-side connector included at no extra cost

 Part numbers printed in light blue indicate products that are suitable for -200°C cryogenic applications

ISO KF



No. of pins	Flange mount	End view	A	B	CA	Reference	Part number
1	DN16KF	5	30	20.8	58	SHVE-K16	9233005
1	DN40KF	5	30	23.4	55	SHVE-1-K40	9233006
2	DN40KF	6	30	23.4	55	SHVE-2-K40	9233007
3	DN50KF	7	30	23.4	55	SHVE-3-K50	9233008
4	DN50KF	8	30	23.4	55	SHVE-4-K50	9233009

Air-side connector included at no extra cost

Weldable



Mount type	Reference	Part number
Single ended	SHVE	9231001

Air-side connector included at no extra cost

 Part numbers printed in light blue indicate products that are suitable for -200°C cryogenic applications

Accessories



Accessory type	Material	Quantity per pack	Reference	Part number
Power push-on	BeCU	10	PPO-094	9924003
Power in-line	BeCU	10	PIL-120	9924006

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





## Section 6.2

## SHV-5 Coaxial

Recessed



## Features

- Recessed contact design for safe high-voltage connection
- Bayonet-style threadless connection
- Air-side connector included
- Three standard vacuum mounting styles
- Custom feedthrough configurations available upon request

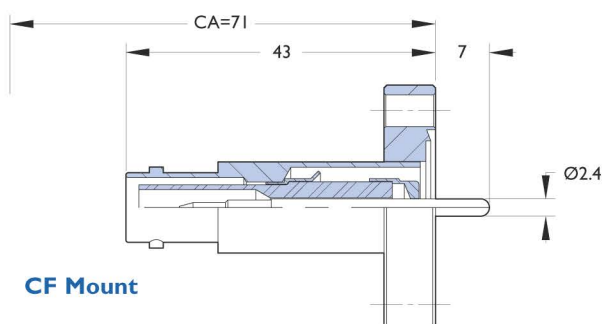
## Specifications

<b>Voltage</b> <sup>1</sup>	5,000V DC maximum
<b>Current</b>	5A
<b>Impedance rating</b>	Non constant
<b>Material</b>	
Flanges	304ss
Shell	304ss
Pins	Nickel
Insulation	Alumina ceramic
<b>Vacuum range</b> UHV/HV	$1 \times 10^{-10}$ mbar / $1 \times 10^{-8}$ mbar
<b>Temperature range</b> <sup>2</sup>	
CF Mounted feedthrough	-200°C to 450°C
ISO KF Mounted feedthrough	-20°C to 150°C
Weldable feedthrough	-200°C to 450°C
Air-side connector	-65°C to 165°C
<b>Dimensions</b>	Reference only, subject to change

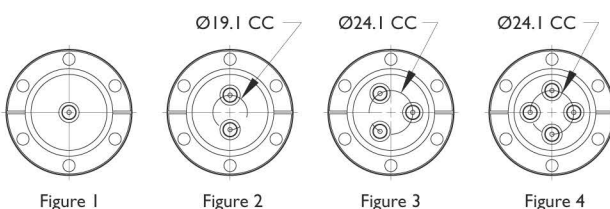
<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

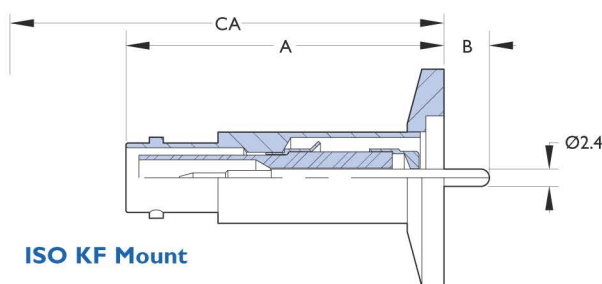
## UHV and HV series



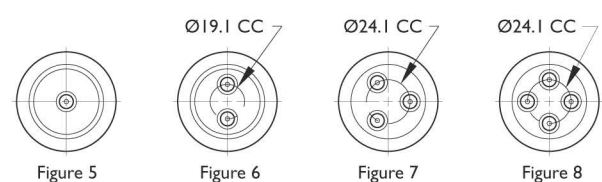
CF Mount



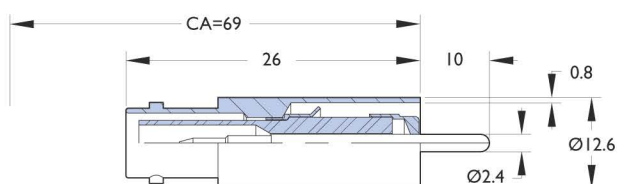
End views Vacuum-side



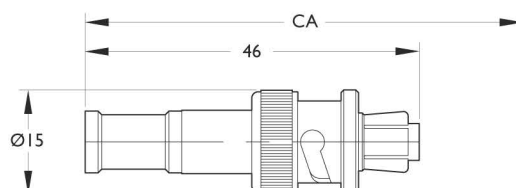
ISO KF Mount



End views Vacuum-side



Weldable



Air-side connector

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

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CF



No. of pins	Flange mount	End view	Reference	Part number
1	DN16CF	1	SHV-C16	9232000
1	DN40CF	1	SHV-C40	9232001
2	DN40CF	2	SHV-2-C40	9232002
3	DN40CF	3	SHV-3-C40	9232003
4	DN40CF	4	SHV-4-C40	9232004

Air-side connector included at no extra cost

Part numbers printed in light blue indicate products that are suitable for -200°C cryogenic applications

ISO KF



No. of pins	Flange mount	End view	A	B	CA	Reference	Part number
1	DN16KF	5	44	6	72	SHV-K16	9233000
1	DN40KF	5	41	9	69	SHV-K40	9233001
2	DN40KF	6	41	9	69	SHV-2-K40	9233002
3	DN50KF	7	41	9	69	SHV-3-K50	9233003
4	DN50KF	8	41	9	69	SHV-4-K50	9233004

Air-side connector included at no extra cost

Weldable



Mount type	Reference	Part number
Single ended	SHV	9231000

Air-side connector included at no extra cost

Part numbers printed in light blue indicate products that are suitable for -200°C cryogenic applications

Accessories



Accessory type	Material	Quantity per pack	Reference	Part number
Power push-on	BeCU	10	PPO-094	9924003
Power in-line	BeCU	10	PIL-I20	9924006

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



## Section 6.2

## SHV-10 Coaxial

Exposed

## Feedthroughs – electrical and optical



## Features

- Recessed contact design for safe high-voltage connection
- Bayonet-style threadless connection
- Air-side connector included
- Three standard vacuum mounting styles
- Custom feedthrough configurations available upon request

## Specifications

**Voltage<sup>1</sup>** 10,000V DC maximum

**Current** 5A

**Impedance rating** Non constant

## Material

Flanges 304ss

Shell 304ss

Pins Nickel

Insulation Alumina ceramic

**Vacuum range** UHV/HV  $1 \times 10^{-10}$  mbar /  $1 \times 10^{-8}$  mbar

Temperature range<sup>2</sup>

CF Mounted feedthrough -100°C to 450°C

ISO KF Mounted feedthrough -20°C to 150°C

Weldable feedthrough -100°C to 450°C

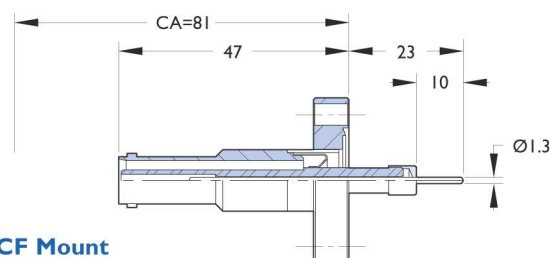
Air-side connector -65°C to 165°C

**Dimensions** Reference only, subject to change

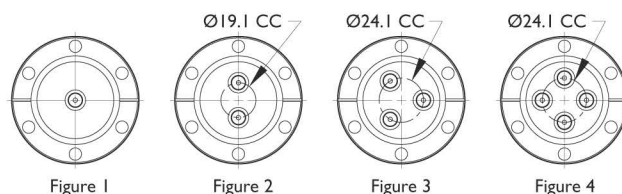
<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

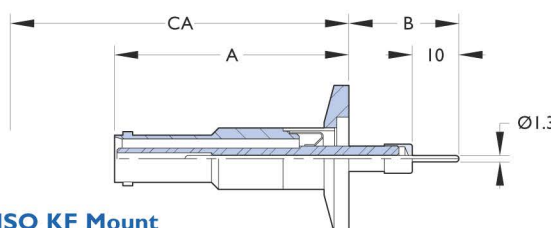
## UHV and HV series



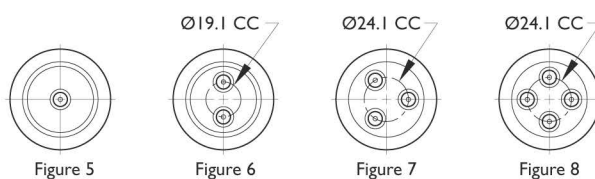
CF Mount



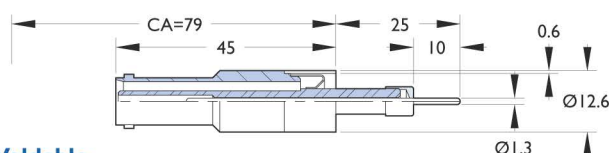
## End views Air-side



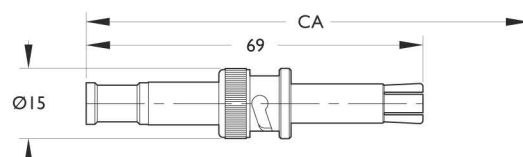
ISO KF Mount



## End views Air-side



Weldable



Air-side connector

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

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CF



No. of pins	Flange mount	End view	Reference	Part number
1	DN16CF	1	SHVEI0-1-C16	9232017
1	DN40CF	1	SHVEI0-1-C40	9232018
2	DN40CF	2	SHVEI0-2-C40	9232019
3	DN40CF	3	SHVEI0-3-C40	9232020
4	DN40CF	4	SHVEI0-4-C40	9232021

Air-side connector included at no extra cost

Part numbers printed in light blue indicate products that are suitable for -200°C cryogenic applications

ISO KF



No. of pins	Flange mount	End view	A	B	CA	Reference	Part number
1	DN16KF	5	48	23	82	SHVEI0-1-K16	9233017
1	DN40KF	5	46	25	79	SHVEI0-1-K40	9233018
2	DN40KF	6	46	25	79	SHVEI0-2-K40	9233019
3	DN50KF	7	46	25	79	SHVEI0-3-K50	9233020
4	DN50KF	8	46	25	79	SHVEI0-4-K50	9233021

Air-side connector included at no extra cost

Weldable



Mount type	Reference	Part number
Single ended	SHVEI0-1-W	9231005

Air-side connector included at no extra cost

Part numbers printed in light blue indicate products that are suitable for -200°C cryogenic applications

Accessories



Accessory type	Material	Quantity per pack	Reference	Part number
Power push-on	BeCU	10	PPO-050	9924001
Power in-line	BeCU	10	PIL-059	9924004

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





## Section 6.2

# SHV-10 Coaxial

### Recessed



### Features

- Recessed contact design for safe high-voltage connection
- Bayonet-style threadless connection
- Air-side connector included
- Three standard vacuum mounting styles
- Custom feedthrough configurations available upon request

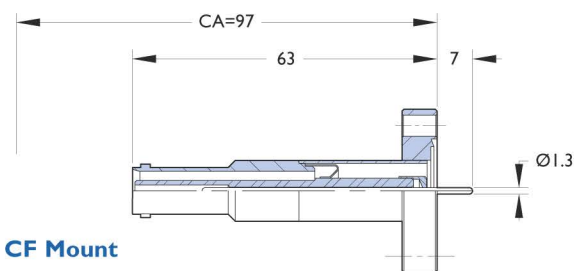
### Specifications

<b>Voltage<sup>1</sup></b>	10,000V DC maximum
<b>Current</b>	5A
<b>Impedance rating</b>	Non constant
<b>Material</b>	
Flanges	304ss
Shell	304ss
Pins	Nickel
Insulation	Alumina ceramic
<b>Vacuum range UHV/HV</b>	$1 \times 10^{-10}$ mbar / $1 \times 10^{-8}$ mbar
<b>Temperature range<sup>2</sup></b>	
CF Mounted feedthrough	-100°C to 450°C
ISO KF Mounted feedthrough	-20°C to 150°C
Weldable feedthrough	-100°C to 450°C
Air-side connector	-65°C to 165°C
<b>Dimensions</b>	Reference only, subject to change

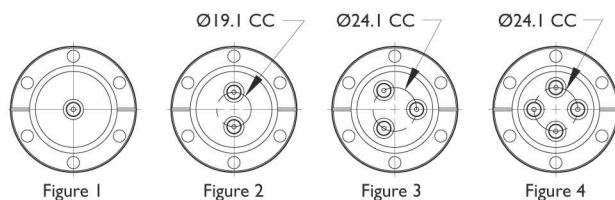
<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

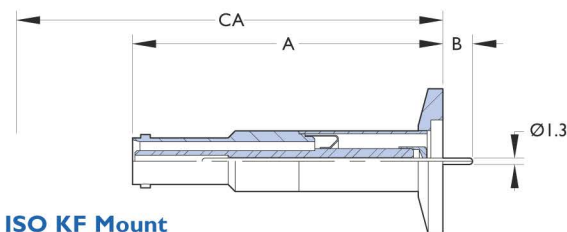
### UHV and HV series



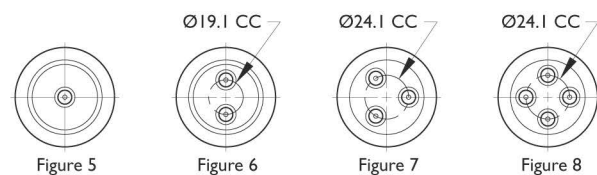
CF Mount



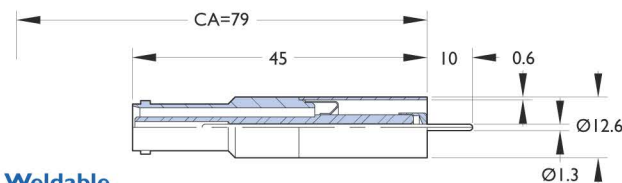
End views Air-side



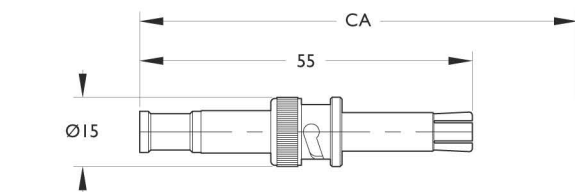
ISO KF Mount



End views Air-side



Weldable



Air-side connector



CF



No. of pins	Flange mount	End view	Reference	Part number
1	DN16CF	1	SHVR10-1-C16	9232012
1	DN40CF	1	SHVR10-1-C40	9232013
2	DN40CF	2	SHVR10-2-C40	9232014
3	DN40CF	3	SHVR10-3-C40	9232015
4	DN40CF	4	SHVR10-4-C40	9232016

Air-side connector included at no extra cost

ISO KF



No. of pins	Flange mount	End view	A	B	CA	Reference	Part number
1	DN16KF	5	64	6	98	SHVR10-1-K16	9233012
1	DN40KF	5	62	9	96	SHVR10-1-K40	9233013
2	DN40KF	6	62	9	96	SHVR10-2-K40	9233014
3	DN50KF	7	62	9	96	SHVR10-3-K50	9233015
4	DN50KF	8	62	9	96	SHVR10-4-K50	9233016

Air-side connector included at no extra cost

Weldable



Mount type	Reference	Part number
Single ended	SHVR10-1-W	9231004

Air-side connector included at no extra cost

Accessories



Accessory type	Material	Quantity per pack	Reference	Part number
Power push-on	BeCU	10	PPO-050	9924001
Power in-line	BeCU	10	PIL-059	9924004

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

## SHV-20 Coaxial

Exposed



## Features

- Recessed contact design for safe high-voltage connection
- Bayonet-style threadless connection
- Air-side connector included
- Three standard vacuum mounting styles
- Custom feedthrough configurations available upon request

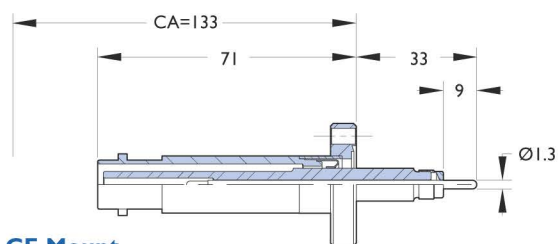
## Specifications

<b>Voltage<sup>1</sup></b>	20,000V DC maximum
<b>Current</b>	15A
<b>Impedance rating</b>	Non constant
<b>Material</b>	
Flanges	304ss
Shell	304ss
Pins	Nickel
Insulation	Alumina ceramic
<b>Vacuum range UHV/HV</b>	$1 \times 10^{-10}$ mbar / $1 \times 10^{-8}$ mbar
<b>Temperature range<sup>2</sup></b>	
CF Mounted feedthrough	-200°C to 450°C
ISO KF Mounted feedthrough	-20°C to 150°C
Weldable feedthrough	-200°C to 450°C
Air-side connector	-65°C to 165°C
<b>Dimensions</b>	Reference only, subject to change

<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

## UHV and HV series



CF Mount

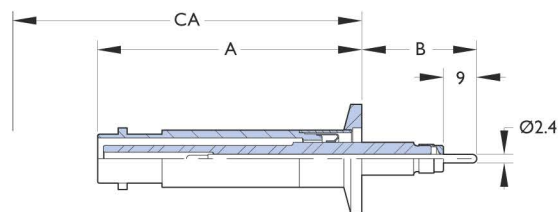


Figure 1



Figure 2

End views Vacuum-side



ISO KF Mount

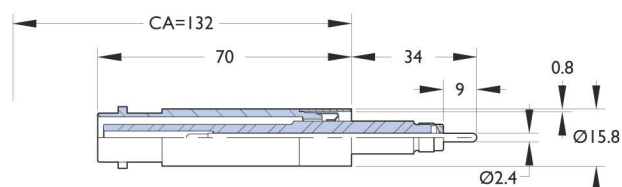


Figure 1

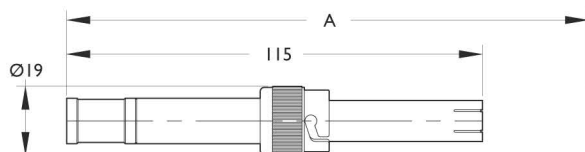


Figure 2

End views Vacuum-side



Weldable



Air-side connector

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

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CF



No. of pins	Flange mount	End view	Reference	Part number
1	DN16CF	1	SHVE20-1-C16	9272006
1	DN40CF	1	SHVE20-1-C40	9272007
2	DN40CF	2	SHVE20-2-C40	9272008

Air-side connector included at no extra cost

 Part numbers printed in light blue indicate products that are suitable for -200°C cryogenic applications

ISO KF



No. of pins	Flange mount	End view	A	B	CA	Reference	Part number
1	DN16KF	3	73	32	134	SHVE20-1-K16	9273006
1	DN40KF	3	70	35	132	SHVE20-1-K40	9273007
2	DN50KF	4	70	35	132	SHVE20-2-K50	9273008

Air-side connector included at no extra cost

Weldable



Mount type	Reference	Part number
Single ended	SHVE20-1-W	9271002

Air-side connector included at no extra cost

 Part numbers printed in light blue indicate products that are suitable for -200°C cryogenic applications

Accessories



Accessory type	Material	Quantity per pack	Reference	Part number
Power push-on	BeCU	10	PPO-094	9924003
Power in-line	BeCU	10	PIL-120	9924006

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



# SHV-20 Coaxial

Recessed



## Features

- Recessed contact design for safe high-voltage connection
- Bayonet-style threadless connection
- Air-side connector included
- Three standard vacuum mounting styles
- Custom feedthrough configurations available upon request

## Specifications

**Voltage<sup>1</sup>** 20,000V DC maximum

**Current** 15A

**Impedance rating** Non constant

### Material

Flanges 304ss

Shell 304ss

Pins Nickel

Insulation Alumina ceramic

**Vacuum range** UHV/HV  $1 \times 10^{-10}$  mbar /  $1 \times 10^{-8}$  mbar

### Temperature range<sup>2</sup>

CF Mounted feedthrough -200°C to 450°C

ISO KF Mounted feedthrough -20°C to 150°C

Weldable feedthrough -200°C to 450°C

Air-side connector -65°C to 165°C

**Dimensions** Reference only, subject to change

<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

## UHV and HV series

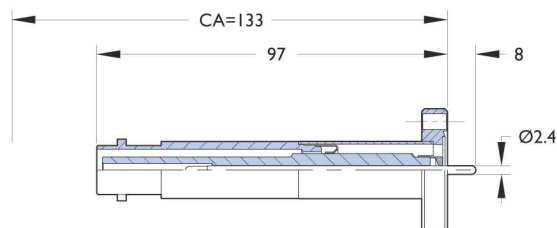
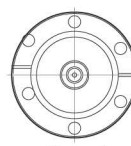
**CF Mount**

Figure 1



Figure 2

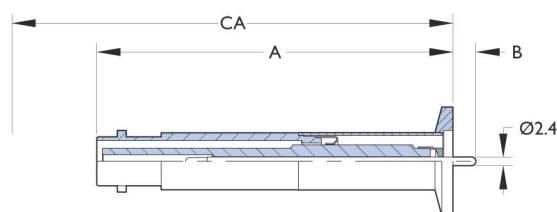
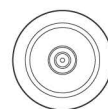
**End views** Vacuum-side**ISO KF Mount**

Figure 3

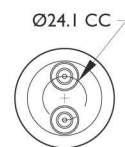
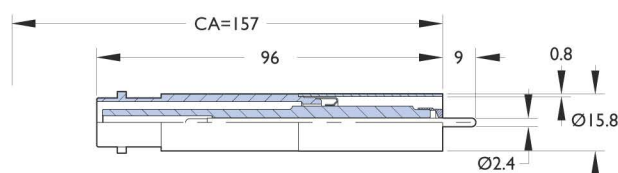
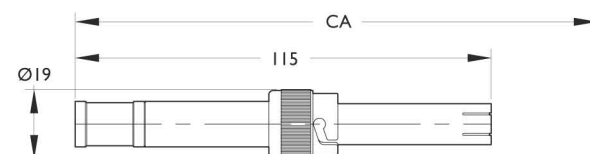


Figure 4

**End views** Vacuum-side**Weldable****Air-side connector**

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

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CF



No. of pins	Flange mount	End view	Reference	Part number
1	DN16CF	1	SHVR20-1-C16	9272009
1	DN40CF	1	SHVR20-1-C40	9272010
2	DN40CF	2	SHVR20-2-C40	9272011

Air-side connector included at no extra cost

 Part numbers printed in light blue indicate products that are suitable for -200°C cryogenic applications

ISO KF



No. of pins	Flange mount	End view	A	B	CA	Reference	Part number
1	DN16KF	3	98	7	160	SHVR20-1-K16	9273009
1	DN40KF	3	96	9	157	SHVR20-1-K40	9273010
2	DN50KF	4	96	9	157	SHVR20-2-K50	9273011

Air-side connector included at no extra cost

Weldable



Mount type	Reference	Part number
Single ended	SHVR20-1-W	9271003

Air-side connector included at no extra cost

 Part numbers printed in light blue indicate products that are suitable for -200°C cryogenic applications

Accessories



Accessory type	Material	Quantity per pack	Reference	Part number
Power push-on	BeCU	10	PPO-094	9924003
Power in-line	BeCU	10	PIL-120	9924006

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

**SHV-B Coaxial**

7,500V / 3A

**Features**

- Recessed contact design for safe high-voltage connection
- Air-side connector included
- Three standard vacuum mounting styles
- Custom feedthrough configurations available upon request

**Specifications**

**Voltage<sup>1</sup>** 7,500V DC maximum

**Current** 3A

**Impedance rating** Non constant

**Material**

Flanges 304ss

Shell 304ss

Pins 304ss

Insulation Alumina ceramic

**Vacuum range** UHV/HV  $1 \times 10^{-10}$  mbar /  $1 \times 10^{-8}$  mbar

**Temperature range<sup>2</sup>**

CF Mounted feedthrough -200°C to 450°C

ISO KF Mounted feedthrough -20°C to 150°C

Weldable feedthrough -200°C to 450°C

Air-side connector -200°C to 350°C

**Dimensions** Reference only, subject to change

<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

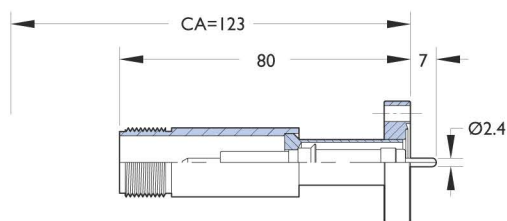
**UHV and HV series****CF Mount**

Figure 1



Figure 2

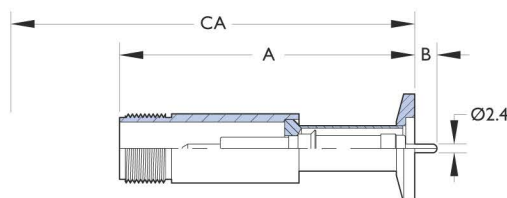
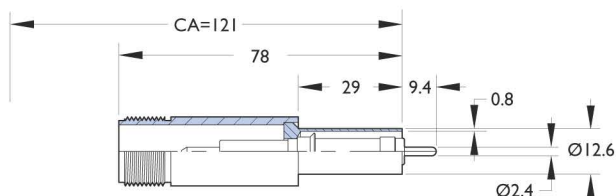
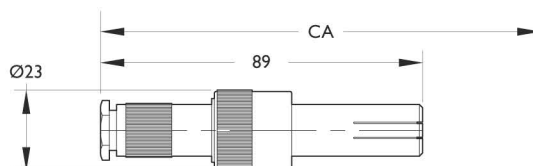
**End views Air-side****ISO KF Mount**

Figure 3



Figure 4

**End views Air-side****Weldable****Air-side connector**

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

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CF



No. of pins	Flange mount	End view	Reference	Part number
1	DN16CF	1	BSHV-C16	9262000
1	DN40CF	1	BSHV-C40	9262001
2	DN40CF	2	BSHV-2-C40	9262002

Air-side connector included at no extra cost

 Part numbers printed in light blue indicate products that are suitable for -200°C cryogenic applications

ISO KF



No. of pins	Flange mount	End view	A	B	CA	Reference	Part number
1	DN16KF	3	82	6	125	BSHV-K16	9263000
1	DN40KF	3	79	9	123	BSHV-K40	9263001
2	DN50KF	4	79	9	123	BSHV-2-K40	9263002

Air-side connector included at no extra cost

Weldable



Mount type	Reference	Part number
Single ended	BSHV	9261000

Air-side connector included at no extra cost

 Part numbers printed in light blue indicate products that are suitable for -200°C cryogenic applications

Accessories



Accessory type	Material	Quantity per pack	Reference	Part number
Power, push-on	BeCU	10	PPO-094	9924003
Power in-line	BeCU	10	PIL-120	9924006

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



# Type-N Coaxial

Single and double ended



## Features

- High-frequency signal transmission to 1GHz
- Air-side connector included
- Three standard vacuum mounting styles
- Custom feedthrough configurations available upon request

## Specifications

**Voltage<sup>1</sup>** 500V DC maximum

**Current** 3A

**Impedance rating** Non constant

### Material

Flanges 304ss

Shell 304ss

Pins Nickel

Insulation Alumina ceramic

**Vacuum range** UHV/HV  $1 \times 10^{-10}$  mbar /  $1 \times 10^{-8}$  mbar

### Temperature range<sup>2</sup>

CF Mounted feedthrough -200°C to 450°C

ISO KF Mounted feedthrough -20°C to 150°C

Weldable feedthrough -200°C to 450°C

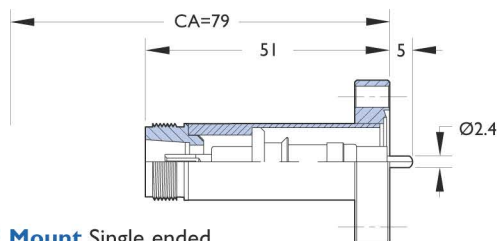
Air-side connector -65°C to 165°C

**Dimensions** Reference only, subject to change

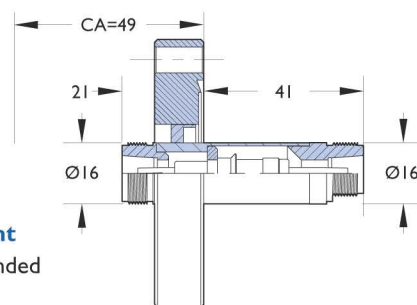
<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

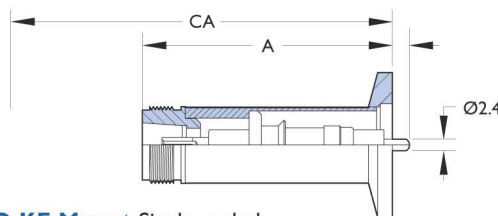
## UHV and HV series



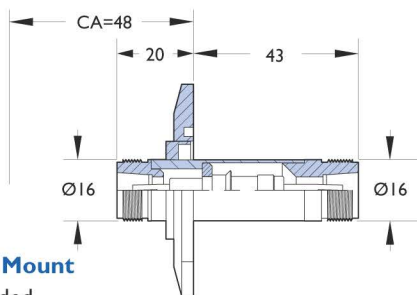
**CF Mount** Single ended



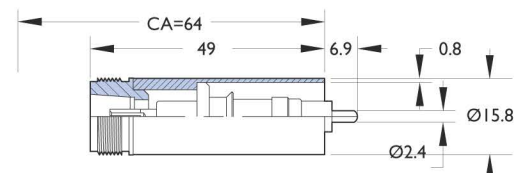
**CF Mount**  
Double ended



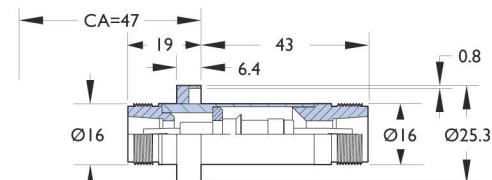
**ISO KF Mount** Single ended



**ISO KF Mount**  
Single ended



**Weldable** Single ended



**Weldable** Double ended

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Type-N Coaxial

Single and double ended



Type-N Coaxial

CF



No. of pins	End type	Flange mount	Bolt circle	Reference	Part number
1	Single ended	DN16CF	–	N-C16	9242000
1	Single ended	DN40CF	–	N-C40	9242001
2	Single ended	DN40CF	24.1	N-2-C40	9242002
1	Double ended	DN40CF	–	ND-C40	9242003

Air-side connector included at no extra cost

Part numbers printed in light blue indicate products that are suitable for -200°C cryogenic applications

ISO KF



No. of pins	End type	Flange mount	Bolt circle	A	B	CA	Reference	Part number
1	Single ended	DN16KF	–	52	3.6	80	N-K16	9243000
1	Single ended	DN40KF	–	49	6.1	77	N-K40	9243001
2	Single ended	DN50KF	24.1	97	6.1	77	N-2-K50	9243002
1	Double ended	DN40KF	–	–	–	–	ND-K40	9243003

Air-side connector included at no extra cost

Weldable



Mount type	Reference	Part number
Single ended	N	9241000
Double ended	ND	9241001

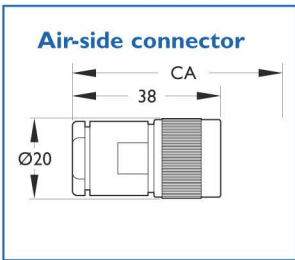
Air-side connector included at no extra cost

Part numbers printed in light blue indicate products that are suitable for -200°C cryogenic applications

Accessories



Accessory type	Material	Quantity per pack	Reference	Part number
Power push-on	BeCU	10	PPO-094	9924003
Power in-line	BeCU	10	PIL-120	9924006



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## Section 6.2

## SMA Coaxial

Single and double ended



## Features

- High-frequency signal transmission to 1GHz
- Air-side connector included
- Three standard vacuum mounting styles
- Custom feedthrough configurations available upon request

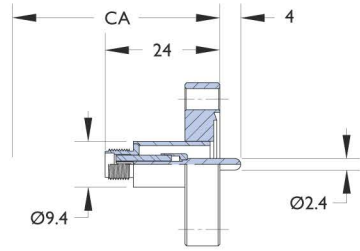
## Specifications

<b>Voltage<sup>1</sup></b>	700V DC maximum
<b>Current</b>	1A
<b>Impedance rating</b>	Non constant
<b>Material</b>	
Flanges	304ss
Shell	304ss
Pins	304ss
Insulation	Alumina ceramic
<b>Vacuum range</b> UHV/HV	$1 \times 10^{-10}$ mbar / $1 \times 10^{-8}$ mbar
<b>Temperature range<sup>2</sup></b>	
CF Mounted feedthrough	-200°C to 450°C
ISO KF Mounted feedthrough	-20°C to 150°C
Weldable feedthrough	-200°C to 450°C
Air-side connector	-65°C to 165°C

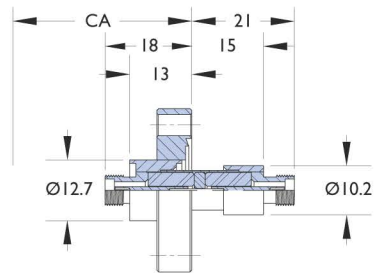
**Dimensions** Reference only, subject to change<sup>1</sup> See intended operating parameters in introductory section<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

## Feedthroughs – electrical and optical

## UHV and HV series

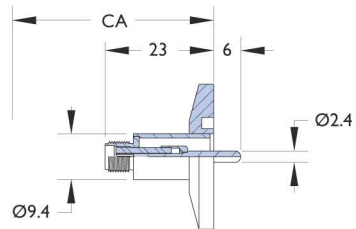


CF Mount Single ended

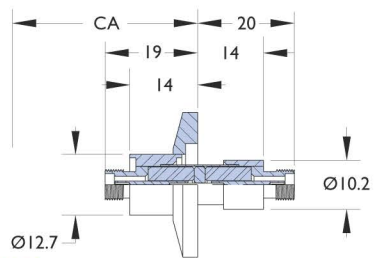


CF Mount

Double ended

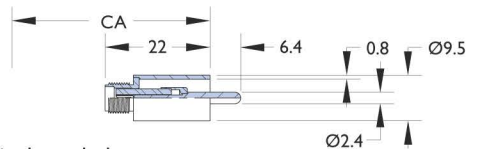


ISO KF Mount Single ended

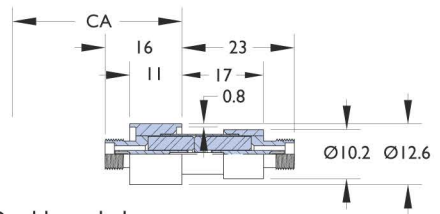


ISO KF Mount

Double ended



Weldable Single ended



Weldable Double ended

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CF



End type	Flange mount	CA	Reference	Part number
Single ended	DNI6CF	43	SMA-CI6	9252000
Double ended	DNI6CF	37	SMAD-CI6	9252001

Air-side connector included at no extra cost

 Part numbers printed in light blue indicate products that are suitable for -200°C cryogenic applications

ISO KF



End type	Flange mount	CA	Reference	Part number
Single ended	DNI6KF	43	SMA-KI6	9253000
Double ended	DNI6KF	37	SMAD-KI6	9253001

Air-side connector included at no extra cost

Weldable



Mount type	CA	Reference	Part number
Single ended	41	SMA	9251000
Double ended	35	SMAD	9251001

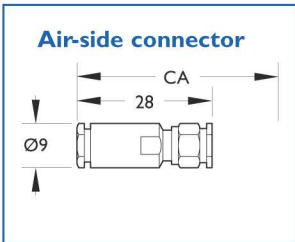
Air-side connector included at no extra cost

 Part numbers printed in light blue indicate products that are suitable for -200°C cryogenic applications

Accessories



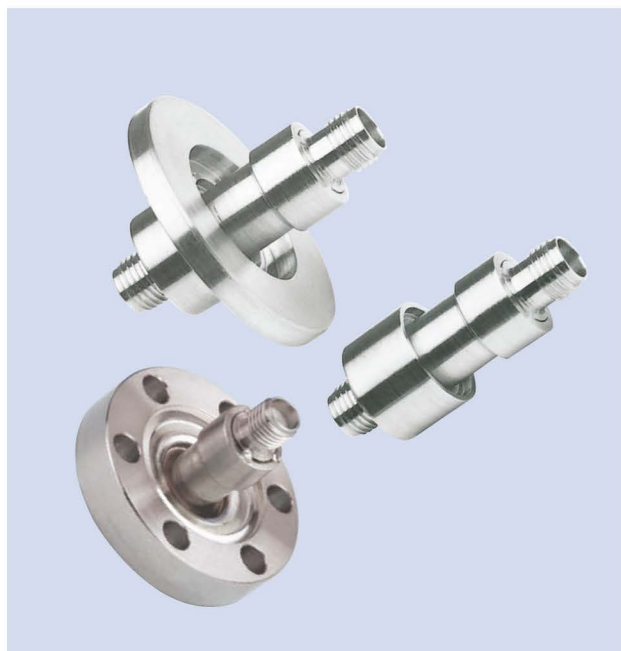
Accessory type	Material	Quantity per pack	Reference	Part number
Power push-on	BeCU	10	PPO-094	9924003
Power in-line	BeCU	10	PIL-120	9924006



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## Features

- High-frequency signal transmission to 8GHz
- Air-side connector included
- Three standard vacuum mounting styles
- Custom feedthrough configurations available upon request

## Specifications

<b>Voltage<sup>1</sup></b>	700V DC maximum
<b>Current</b>	3A
Impedance rating	50Ω Matched

## Material

Flanges	304ss
Shell	304ss
Pins	304ss
Insulation	Alumina ceramic

<b>Vacuum range</b> UHV/HV	$1 \times 10^{-10}$ mbar/ $1 \times 10^{-8}$ mbar
----------------------------	---

### Temperature range<sup>2</sup>

CF Mounted feedthrough	-200°C to 200°C
ISO KF Mounted feedthrough	-20°C to 150°C
Weldable feedthrough	-200°C to 200°C
Air-side connector	-65°C to 165°C

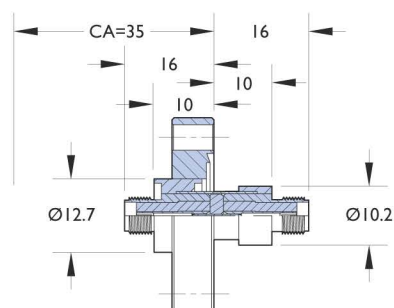
**Dimensions** Reference only, subject to change

See intended operating parameters in introductory section

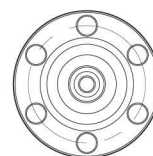
<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest

rated component

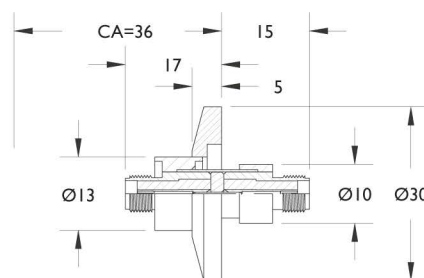
## UHV and HV series



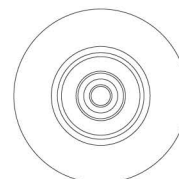
### CF Mount



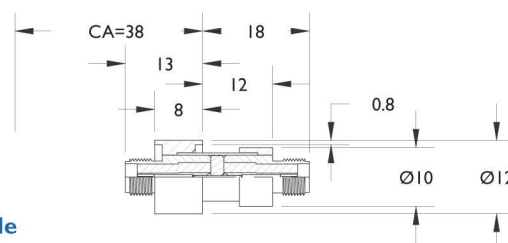
**End view** Vacuum-side Figure 1



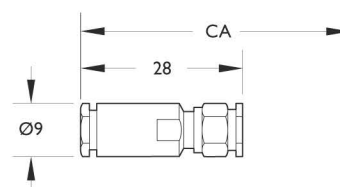
**ISO KF Mount**



**End view** Vacuum-side



Weldable



### Air-side connector

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CF



No. of pins	Flange mount	Reference	Part number
I	DN16CF	SMA50-CI6	9252004

Air-side connector included at no extra cost

ISO KF



No. of pins	Flange mount	End view	Reference	Part number
I	K16	2	SMAD-K16	9253004

Air-side connector included at no extra cost

Weldable



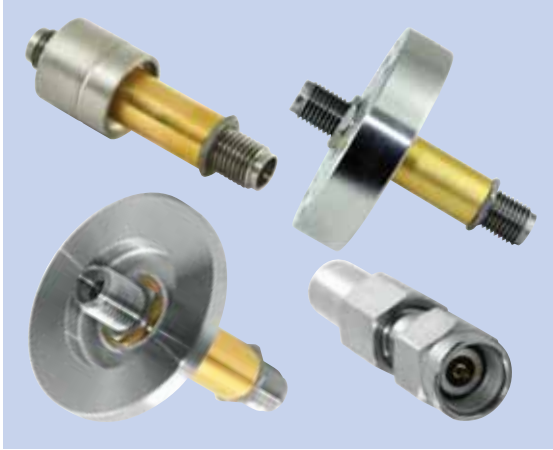
Mount type	Reference	Part number
Double ended	SMAD-50	9251004

Air-side connector included at no extra cost



# 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 <sup>1</sup>** 300V/3A

#### Material

Shell	Stainless Steel
Pins	Stainless Steel
Seal/Insulation	Aluminium Oxide

#### Vacuum range

UHV (CF)	1 x10 <sup>-9</sup> mbar
HV (KF)	1 x10 <sup>-8</sup> mbar

#### Temperature range <sup>2</sup>

Feedthrough – CF	-200°C to +250°C
Feedthrough – KF	-20°C to +160°C
Thermal gradient	25°C per minute max.

**Uses <sup>3</sup>** 2.92mm SMA Interface

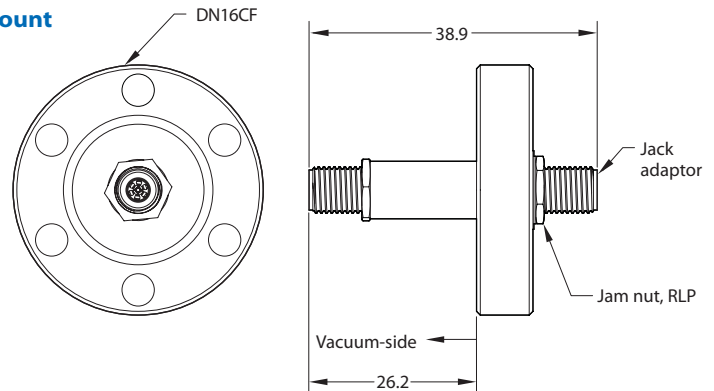
<sup>1</sup> Electrical ratings are maximum test values. Feedthroughs are intended for instrumentation applications carrying low level signal voltages and currents. Current ratings shown are maximum per pin (and maximum per feedthrough).

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component.

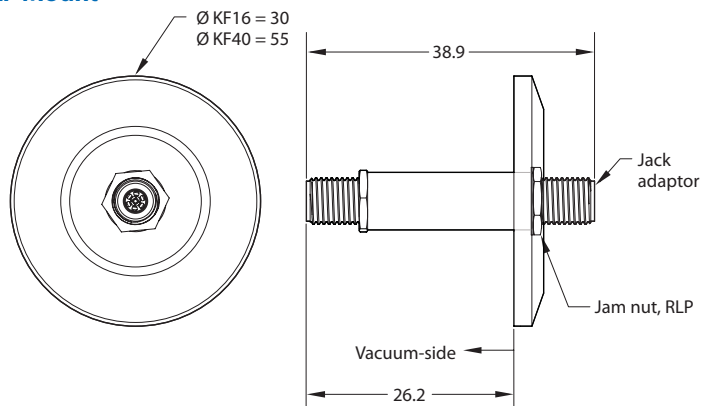
<sup>3</sup> Air-side and vacuum-side connectors are not included with feedthroughs.

### UHV and HV series

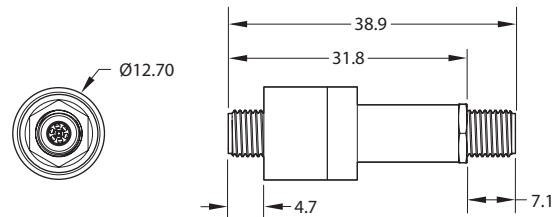
#### CF Mount



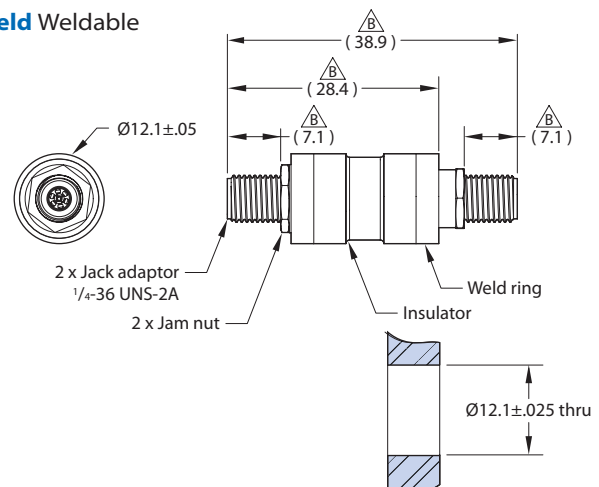
#### ISO KF Mount



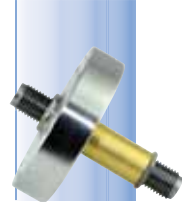
#### Grounded shield Weldable



#### Floating shield Weldable



All dimensions are nominal in millimetres unless specified.

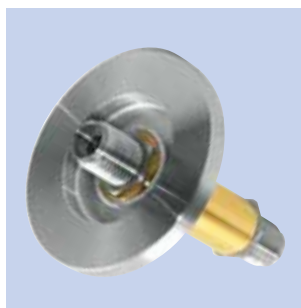


### CF



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

### ISO KF



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

### Weldable



Mount type	Reference	Part number
Double ended, floating shield <sup>1</sup>	SMA45-FS-WELD	<b>1518004</b>
Double ended, grounded shield <sup>1</sup>	SMA45-GS-WELD	<b>1518006</b>

### Connectors



Description	Reference	Part number
Air-side connector	SMA45-CON	<b>1518005</b>

<sup>1</sup> **NB** Air-side and vacuum-side connectors are not included with feedthroughs

All dimensions are nominal in millimetres unless specified.



## Section 6.2

**Microdot® Coaxial**

Grounded shield / single ended

**Features**

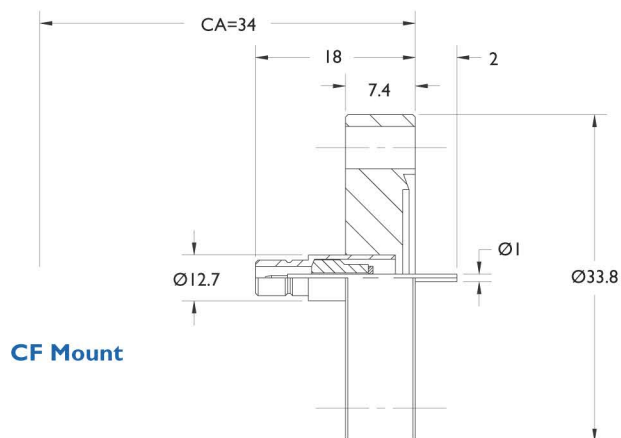
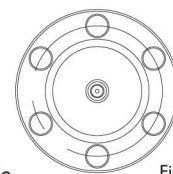
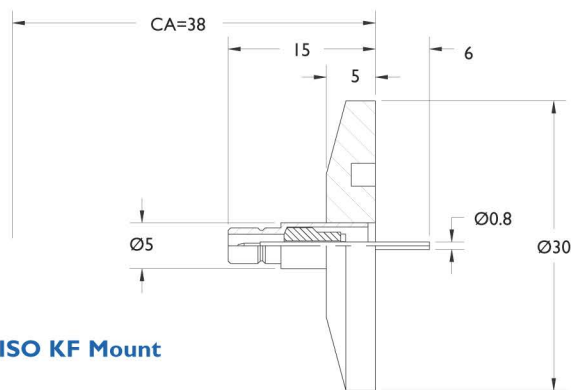
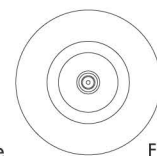
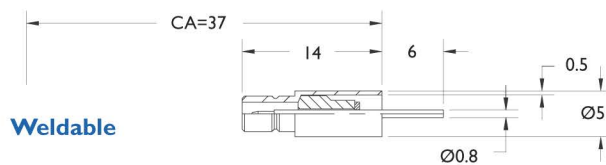
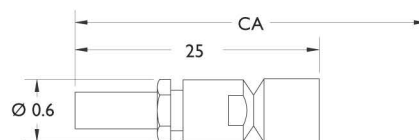
- Noise shield for instrumentation transmission
- Air-side connector included
- Standard vacuum mounting styles
- Custom feedthrough configurations available upon request
- 3 standard vacuum mount styles

**Specifications**

<b>Voltage<sup>1</sup></b>	500V DC maximum
<b>Current</b>	2A
<b>Impedance rating</b>	Non constant
<b>Material</b>	
Flanges	304ss
Shell	304ss
Pins	Molybdenum
Insulation	Alumina ceramic
<b>Vacuum range UHV/HV</b>	$1 \times 10^{-10}$ mbar / $1 \times 10^{-8}$ mbar
<b>Temperature range<sup>2</sup></b>	
CF Mounted feedthrough	-100°C to 400°C
ISO KF Mounted feedthrough	-20°C to 150°C
Weldable feedthrough	-100°C to 400°C
Air-side connector	-65°C to 165°C
<b>Dimensions</b>	Reference only, subject to change

<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

**Feedthroughs – electrical and optical****UHV Series****CF Mount****End view Vacuum-side****Figure 1****ISO KF Mount****End view Vacuum-side****Figure 1****Weldable****Air-side connector**

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

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CF



No. of pins	Flange mount	Reference	Part number
1	DN16CF	SMB0-C16	9252100

Air-side connector included at no extra cost

ISO KF



No. of pins	Flange mount	End view	Reference	Part number
1	K075	2	SMB-K16	9253100

Air-side connector included at no extra cost

Weldable



Mount type	Mount dia.	Reference	Part number
Single ended	25.4	SMB	9251100

Air-side connector included at no extra cost

Accessories



Accessory type	Material	Quantity per pack	Reference	Part number
In-vacuum female contact	Ni-Fe Gold plated	10	DPINFC-10	1510102
In-vacuum male contact	Ni-Fe Gold plated	10	DPINMC-10	1510103
Power, in-line	Be-Cu	10	PIL-059	9924004

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# Tri-ax



## 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 <sup>1</sup>

#### Material

Shell	Stainless Steel 304
Pins	Ni/Gold plated BeCu
Seal/Insulation	Aluminium Oxide/PEEK®

#### Vacuum range

UHV (CF)	1 x 10 <sup>-9</sup> mbar
HV (KF)	1 x 10 <sup>-8</sup> mbar

#### Temperature range <sup>2</sup>

Feedthrough – CF	-200°C to +250°C
Feedthrough – KF	-20°C to +160°C
Thermal gradient	25°C per minute max.

<sup>1</sup> 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).

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component.

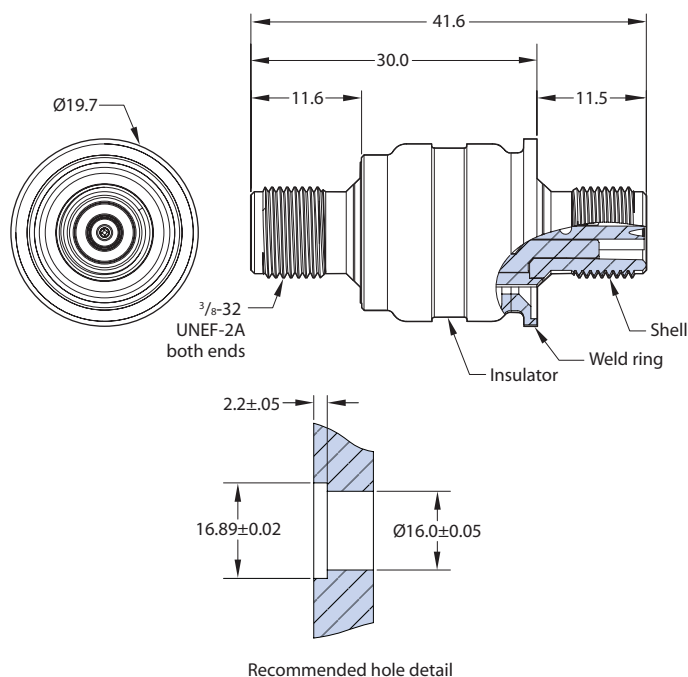
Air-side and vacuum-side connectors are not included with feedthroughs.

## Description

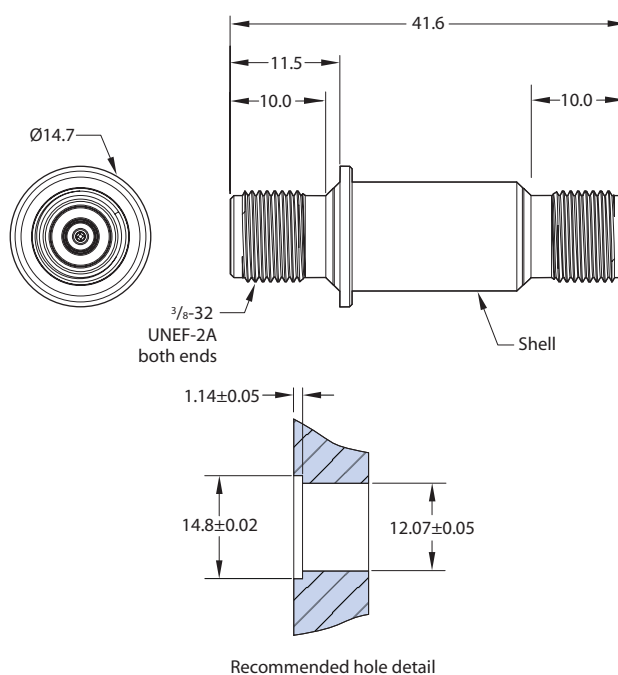
This MDC feedthrough is true tri-axial, all three contact points are electrically isolated from one another. All ceramic construction without any glass in a very low profile design, which allows it to be mounted on both KF16 and DN16CF flanges upwards.

## Weldable feedthroughs

### Floating shield



### Grounded shield





## CF



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

**Note** Connectors not included

## ISO KF



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

**Note** Connectors not included

## Weldable



No. of pins	Description	Reference	Part number
1	Double ended, floating shield, weldable <sup>1</sup>	TRIAX-FS-WELD	<b>1519008</b>
1	Double ended, grounded shield, weldable <sup>1</sup>	TRIAX-GS-WELD	<b>1519009</b>

**Note** Connectors are not included

## Connectors



Description	Reference	Part number
Air-side connector <sup>1</sup>	TRIAX-CON-AIR	<b>1519010</b>
Vacuum-side connector	TRIAX-CON-VAC	<b>1519011</b>

<sup>1</sup> **NB** Air-side and vacuum-side connectors are not included with feedthroughs



## Between series

BNC-Microdot® / crystal sensor feedthrough



## Features

- Noise shield for instrumentation transmission
- Bayonet-style threadless connection for air-side
- Air-side connector included
- In-vacuum cables available [See Section 6.7](#)
- Standard vacuum mounting styles
- Custom feedthrough configurations available upon request

## Specifications

Voltage<sup>1</sup> 500V DC maximum

Current 1A

Impedance rating Non constant

## Material

Flanges 304ss

Shell 304ss

Pins 304ss

Insulation Alumina ceramic

Vacuum range UHV/HV  $1 \times 10^{-10}$  mbar /  $1 \times 10^{-8}$  mbarTemperature range<sup>2</sup>

CF Mounted feedthrough -100°C to 400°C

ISO KF Mounted feedthrough -20°C to 150°C

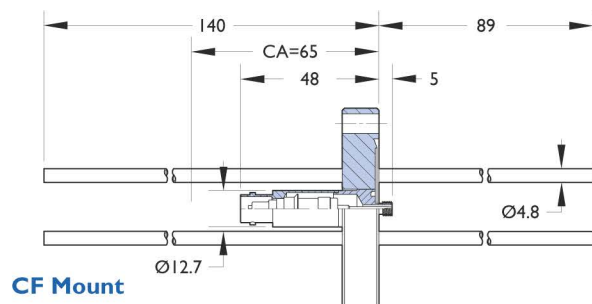
Weldable feedthrough -100°C to 400°C

Air-side connector -65°C to 165°C

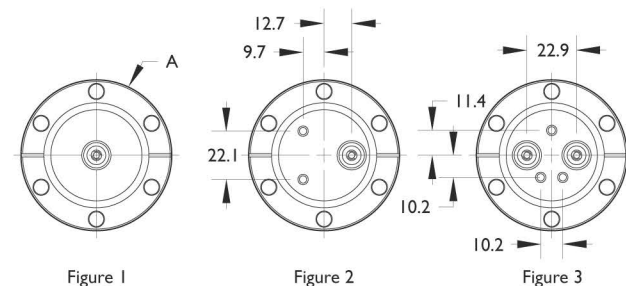
Dimensions Reference only, subject to change

<sup>1</sup> See intended operating parameters in introductory section<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

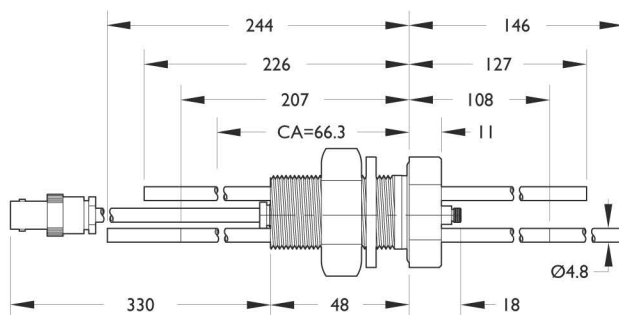
## UHV and HV series



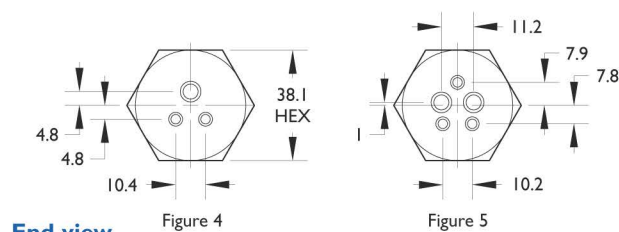
CF Mount



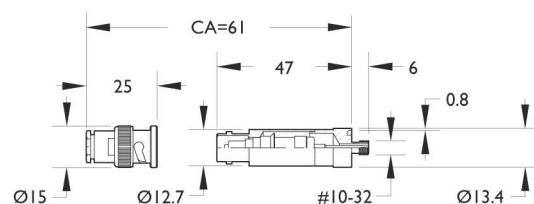
End view



Baseplate mount



End view



BNC to Microdot®

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

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Between series

BNC-Microdot® / crystal sensor feedthrough



Between series

CF



Flange mount	End view figure	Coaxial quantity	Cooling lines quantity	Reference	Part number
DN16CF	1	1	–	BBNCMI-1X-C16	9292194
DN40CF	1	1	–	BBNCMI-1X-C40	9292195
DN40CF	2	1	2	BBNCMI-1X-2L-C40	9292192
DN40CF	3	2	3	BBNCMI-2X-3L-C40	9292193

Baseplate



Flange mount	End view figure	Coaxial quantity	Cooling lines quantity	Reference	Part number
1" Baseplate	4	1	2	BBNCMI-1X-2L-B1	9294190
1" Baseplate	5	2	3	BBNCMI-3X-3L-B1	9294191

Weldable



End type	Reference	Part number
BNC-Microdot®	BBNCMI	9291190

Accessories



Accessory type	Quantity per pack	Reference	Part number
Microdot® – Microdot® cable	1	VCR8-MIMI-36	9931313



## Section 6.2

## Between series

BNC / MHV-A



## Features

- Noise shield for instrumentation transmission
- Bayonet-style threadless connection for air-side
- Air-side connector included
- In-vacuum cables available See Section 6.7
- Two standard vacuum mounting styles
- Custom feedthrough configurations available upon request

## Specifications

**Voltage<sup>1</sup>** 500V DC maximum

**Current** 3A

**Impedance rating** Non constant

**Material**

Flanges 304ss

Shell 304ss

Pins 304ss

Insulation Alumina ceramic

**Vacuum range** UHV/HV  $1 \times 10^{-10}$  mbar /  $1 \times 10^{-8}$  mbar

**Temperature range<sup>2</sup>**

CF Mounted feedthrough -200°C to 450°C

Weldable feedthrough -200°C to 450°C

Air-side connector -65°C to 165°C

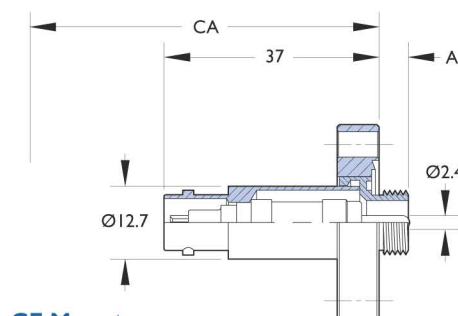
**Dimensions** Reference only, subject to change

<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

## Feedthroughs – electrical and optical

## UHV Series



CF Mount

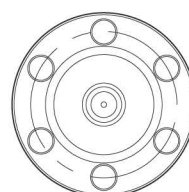


Figure 1

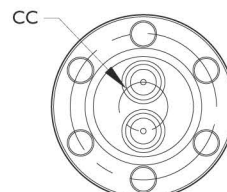
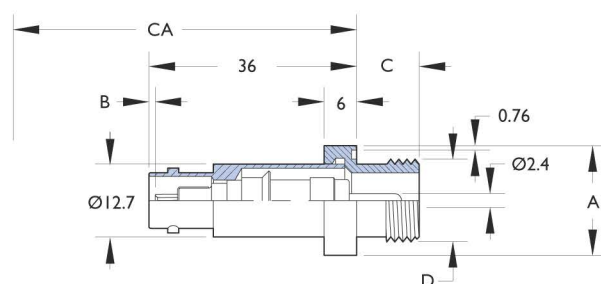
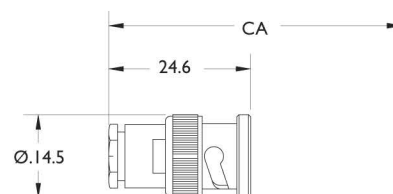


Figure 2

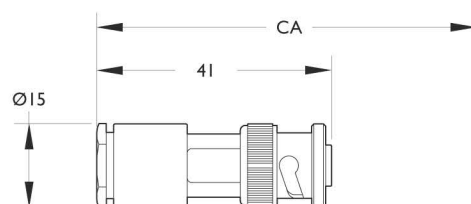
## End views Vacuum-side



Weldable



## Air-side connector



## Air-side connector

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

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CF



Flange mount	End view figure	No. of pins	A	CA	CC	Reference	Part number
DN16CF	I	I	4.8	53	–	MHV-A8-C16	9292200
DN40CF	2	2	4.8	53	20	MHV-A8-2-C40	9292202
DN40CF	I	I	9.7	68	–	MHV-A4-C40	9292201
DN40CF	2	2	9.7	68	20	MHV-A4-2-C40	9292203

Air-side connector included at no extra cost

Weldable



Flange mount	Cable	A	B	C	CA	D	Reference	Part number
16 dia.	3.9	15.8	3.8/2.5	6.4	51	7/16"-20	BNC-A8	9291100
19 dia.	6.4	18.9	2.2/1.1	11	66	9/16"-18	BNC-A4	9291201

Air-side connector included at no extra cost

Accessories



Accessory type	Terminal	Quantity per pack	Reference	Part number
BNC in-vacuum cable	A-BNC	I	VCR8-ABNC-36	9931305
MVH in-vacuum cable	A-MVH	I	VCR8-AMHV-36	9932312

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



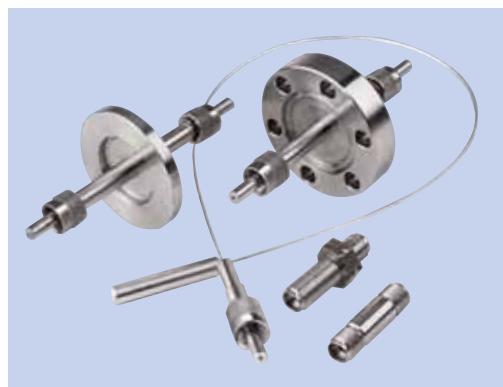
# Fibre optics Feedthroughs

## 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/cm<sup>2</sup> in continuous wave mode and 500kW/cm<sup>2</sup> 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. The single feedthrough transmits both UV and IR wavelengths.



## 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 laser	<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

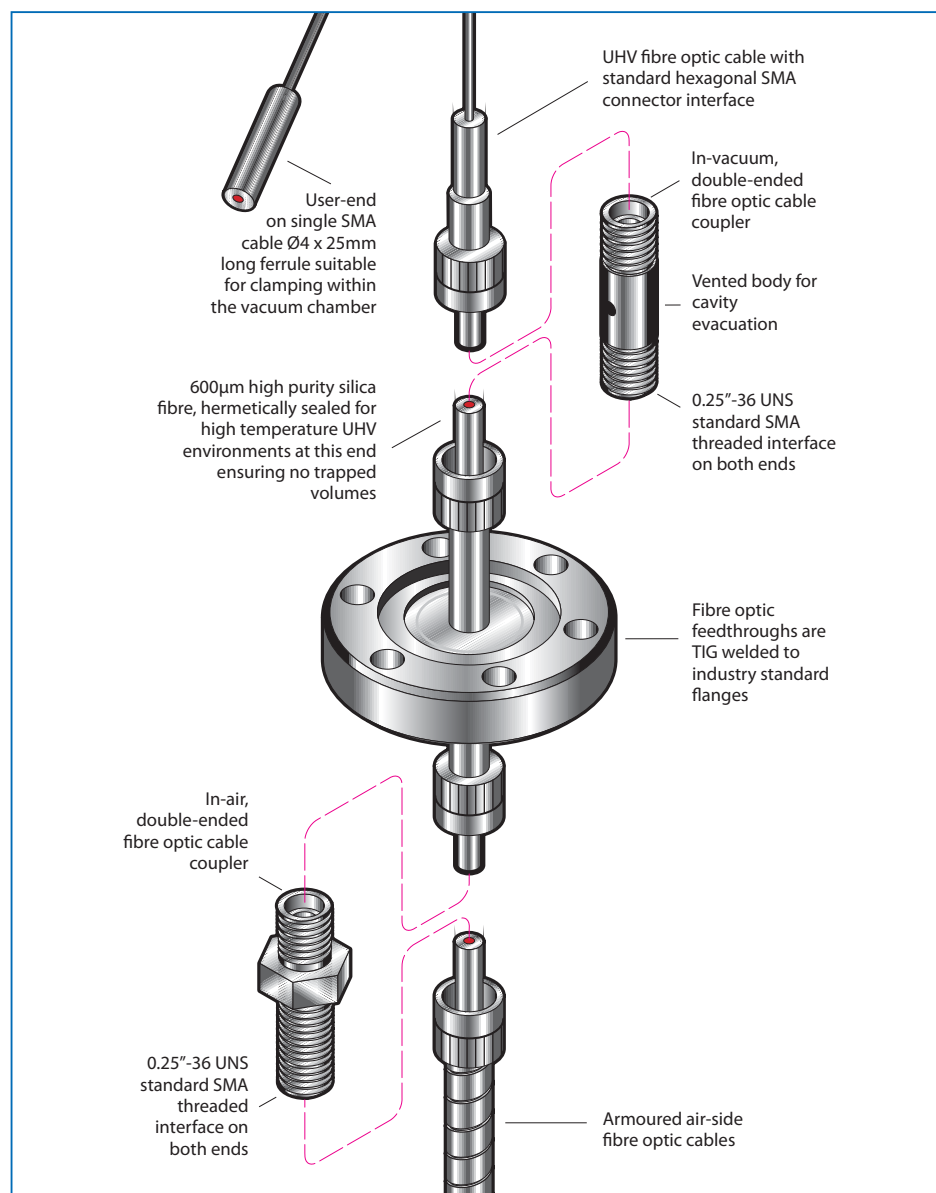
### Vacuum range

UHV / HV	1x10 <sup>-10</sup> / 1x10 <sup>-8</sup> mbar
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### Temperature range <sup>1</sup>

Feedthrough	200°C
Cable	Copper coated -196°C to 200°C

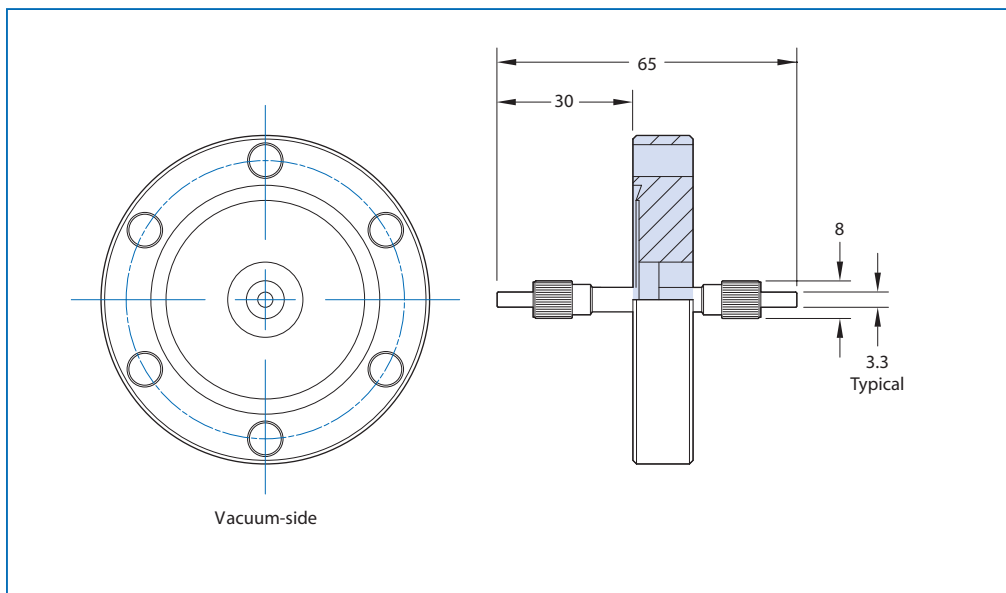
<sup>1</sup> Overall assembly ratings must be adjusted to that of the lowest rated component.





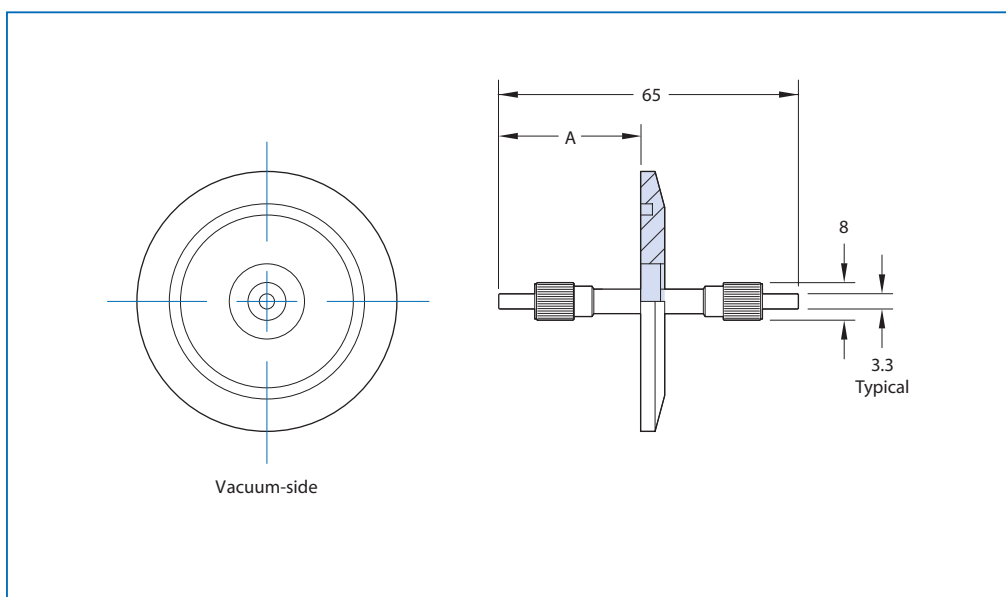
### UHV, UV and IR Fibre optic feedthrough

Feedthrough type	Flange	Reference	Part number
UV + IR	DN16CF	FFT-600-C16	<b>1513411</b>
UV + IR	DN40CF	FFT-600-C40	<b>1513412</b>



### HV, UV and IR Fibre optic feedthrough

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



All dimensions are nominal in millimetres unless specified.

# Fibre optics

## Cables and couplers

### UHV, UV and IR Fibre optic feedthrough

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

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
<b>Ultraviolet</b>							
UV	Dual SMA	5000	5	8	15	CP-UV600-5	<b>1513300</b>
UV	Dual SMA	10000	5	8	15	CP-UV600-10	<b>1513301</b>
<b>Infrared</b>							
IR	Dual SMA	5000	5	8	15	CP-IR600-5	<b>1513200</b>
IR	Dual SMA	10000	5	8	15	CP-IR600-10	<b>1513201</b>

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	<b>1513400</b>
Air	Dual SMA	1/4"-36	25.4	9.5	ADAS	<b>1513401</b>

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

FO-UV600-300S Single SMA

FO-IR600-300D Dual SMA

CP-IR600-5

ADVS

ADAS

All dimensions are nominal in millimetres unless specified.

# Thermocouple

Miniature connectors – 1 pairs



## Features

- TC design is compatible with standard miniature connectors
- TC types C, E, J and K are standard – type N available upon request
- Air-side connector included
- In-vacuum accessories available – see section 6.7
- Three standard vacuum mounting styles
- Custom feedthrough configurations available upon request

## Specifications

**Voltage<sup>1</sup>** mV

**Current** mA

### Material

Flanges 304ss

Shell 304ss

Pins See TC options

Insulation Alumina ceramic

**Vacuum range** UHV/HV  $1 \times 10^{-10}$  mbar /  $1 \times 10^{-8}$  mbar

### Temperature range<sup>2</sup>

CF Mounted feedthrough -100°C to 450°C

ISO KF Mounted feedthrough -20°C to 150°C

Weldable feedthrough -100°C to 450°C

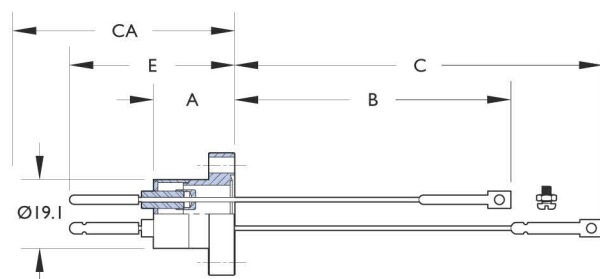
Air-side connector -65°C to 165°C

**Dimensions** Reference only, subject to change

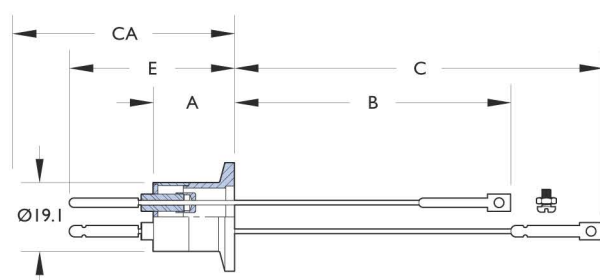
<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

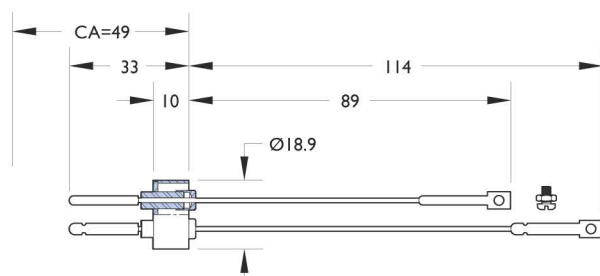
## UHV and HV series



CF Mount



ISO KF Mount



Weldable

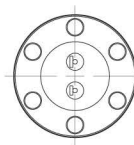


Figure 1

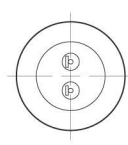


Figure 2

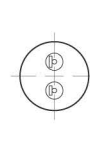
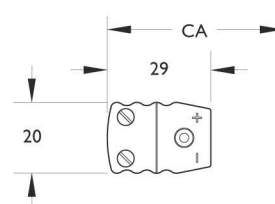


Figure 3

### End view Air-side



Air-side connector

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

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Thermocouple

Miniature connectors – I pair



Thermocouple

CF



No. of pairs	Flange mount	End view figure	TC type	A	B	C	E	CA	Reference	Part number
I	DN16CF	I	C	23	76	102	46	62	TCC-C16	9312000
I	DN40CF	I	C	–	87	112	35	51	TCC-C40	9312027
I	DN16CF	I	E	23	76	102	46	62	TCE-C16	9312001
I	DN16CF	I	J	23	76	102	46	62	TCJ-C16	9312002
I	DN16CF	I	K	23	76	102	46	62	TCK-C16	9312003
I	DN40CF	I	K	–	87	112	35	51	TCK-C40	9312028

Air-side connector included at no extra cost

ISO KF



No. of pairs	Flange mount	End view figure	TC type	A	B	C	E	CA	Reference	Part number
I	DN16KF	2	C	23	76	102	46	62	TCC-K16	9313000
I	DN40KF	2	C	11	88	113	35	50	TCC-K40	9313027
I	DN16KF	2	E	23	76	102	46	62	TCE-K16	9313001
I	DN16KF	2	J	23	76	102	46	62	TCJ-K16	9313002
I	DN16KF	2	K	23	76	102	46	62	TCK-K16	9313003
I	DN40KF	2	K	11	88	113	35	50	TCK-K40	9313028

Air-side connector included at no extra cost

Weldable



No. of pairs	End view figure	TC type	Reference	Part number
I	3	C	TCC	9311000
I	3	E	TCE	9311001
I	3	J	TCJ	9311002
I	3	K	TCK	9311003

Air-side connector included at no extra cost

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

# Thermocouple

Miniature connectors – 2 pairs



## Features

- TC design is compatible with standard miniature connectors
- TC types C, E, J and K are standard – type N available upon request
- Air-side connector included
- In-vacuum accessories available – see section 6.7
- Three standard vacuum mounting styles
- Custom feedthrough configurations available upon request

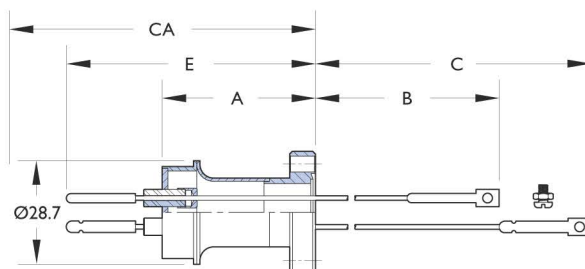
## Specifications

<b>Voltage<sup>1</sup></b>	mV
<b>Current</b>	mA
<b>Material</b>	
Flanges	304ss
Shell	304ss
Pins	See TC options
Insulation	Alumina ceramic
<b>Vacuum range</b> UHV/HV	$1 \times 10^{-10}$ mbar / $1 \times 10^{-8}$ mbar
<b>Temperature range<sup>2</sup></b>	
CF Mounted feedthrough	-100°C to 450°C
ISO KF Mounted feedthrough	-20°C to 150°C
Weldable feedthrough	-100°C to 450°C
Air-side connector	-65°C to 165°C
<b>Dimensions</b>	Reference only, subject to change

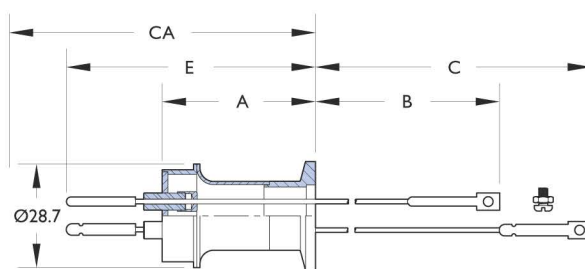
<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

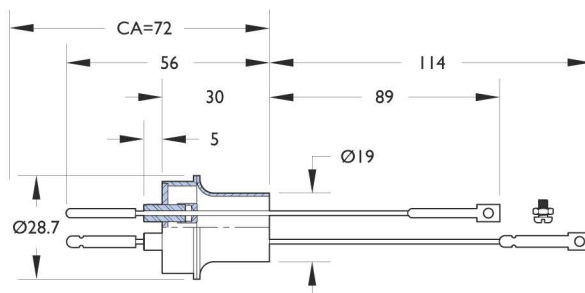
## UHV and HV series



CF Mount



ISO KF Mount



Weldable

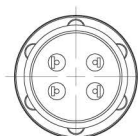


Figure 1

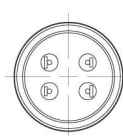


Figure 2

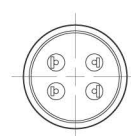
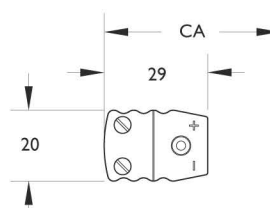


Figure 3

End view Air-side



Air-side connector

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

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Thermocouple

Miniature connectors – 2 pairs



Thermocouple

CF



No. of pairs	Flange mount	End view figure	TC type	A	B	C	E	CA	Reference	Part number
2	DN16CF	I	C	42	76	102	69	84	TCC-2-C16	9312006
2	DN40CF	I	C	32	87	112	58	74	TCC-2-C40	9312029
2	DN16CF	I	E	42	76	102	69	84	TCE-2-C16	9312007
2	DN16CF	I	J	42	76	102	69	84	TCJ-2-C16	9312008
2	DN16CF	I	K	42	76	102	69	84	TCK-2-C16	9312009
2	DN40CF	I	K	32	87	112	58	74	TCK-2-C40	9312030

Air-side connector included at no extra cost

ISO KF



No. of pairs	Flange mount	End view figure	TC type	A	B	C	E	CA	Reference	Part number
2	DN16KF	2	C	42	76	102	69	84	TCC-2-K16	9313006
2	DN40KF	2	C	30	88	113	57	73	TCC-2-K40	9313029
2	DN16KF	2	E	42	76	102	69	84	TCE-2-K16	9313007
2	DN16KF	2	J	42	76	102	69	84	TCJ-2-K16	9313008
2	DN16KF	2	K	42	76	102	69	84	TCK-2-K16	9313009
2	DN40KF	2	K	30	88	113	57	73	TCK-2-K40	9313030

Air-side connector included at no extra cost

Weldable



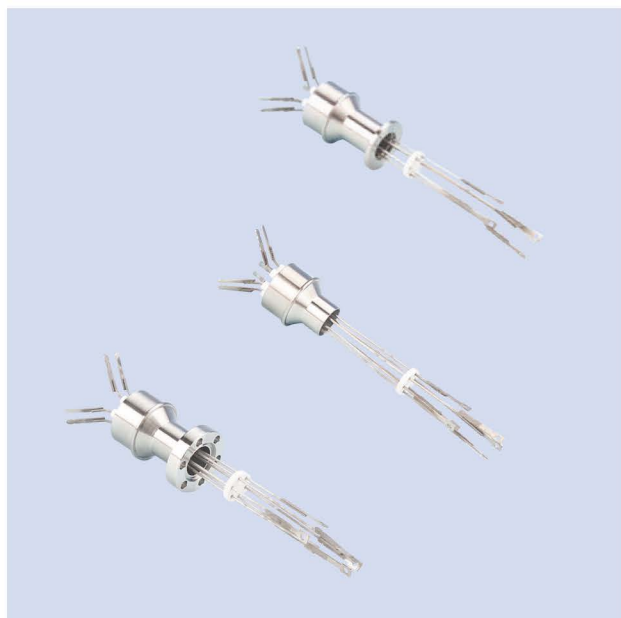
No. of pairs	End view figure	TC type	Reference	Part number
2	3	C	TCC-2	9311006
2	3	E	TCE-2	9311007
2	3	J	TCJ-2	9311008
2	3	K	TCK-2	9311009

Air-side connector included at no extra cost

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

# Thermocouple

Miniature connectors – 3 pairs



## Features

- TC design is compatible with standard miniature connectors
- TC types C, E, J and K are standard – type N available upon request
- Air-side connector included
- In-vacuum accessories available – see section 6.7
- Three standard vacuum mounting styles
- Custom feedthrough configurations available upon request

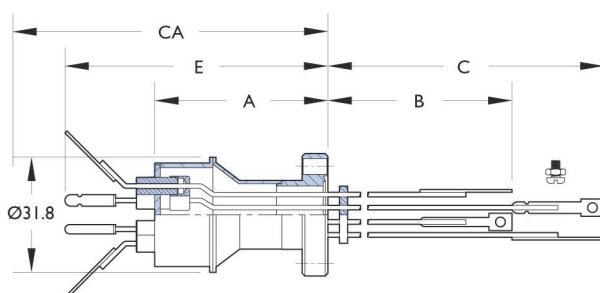
## Specifications

<b>Voltage<sup>1</sup></b>	mV
<b>Current</b>	mA
<b>Material</b>	
Flanges	304ss
Shell	304ss
Pins	See TC options
Insulation	Alumina ceramic
<b>Vacuum range UHV/HV</b>	$1 \times 10^{-10}$ mbar / $1 \times 10^{-8}$ mbar
<b>Temperature range<sup>2</sup></b>	
CF Mounted feedthrough	-100°C to 450°C
ISO KF Mounted feedthrough	-20°C to 150°C
Weldable feedthrough	-100°C to 450°C
Air-side connector	-65°C to 165°C
<b>Dimensions</b>	Reference only, subject to change

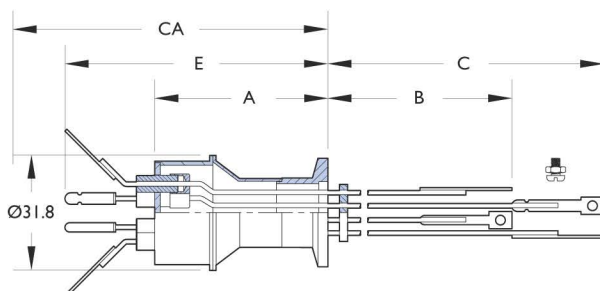
<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

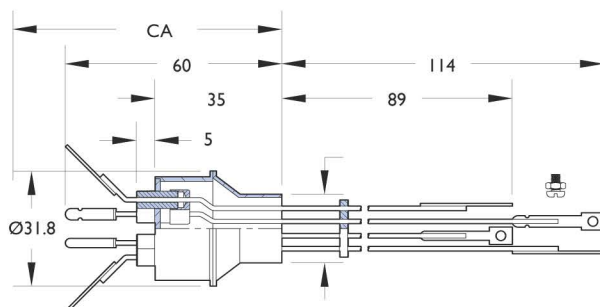
## UHV and HV series



CF Mount



ISO KF Mount



Weldable

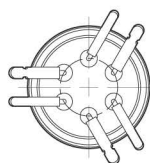


Figure 1

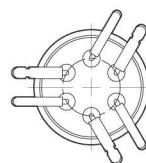


Figure 2

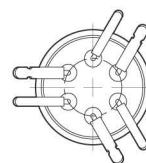
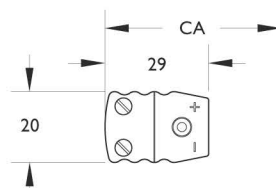


Figure 3

End view Air-side



Air-side connector

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

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France + 33 (0) 437 651 750 [info@mdcvacuum.fr](mailto:info@mdcvacuum.fr)



Thermocouple

Miniature connectors – 3 pairs



Thermocouple

CF



No. of pairs	Flange mount	End view figure	TC type	A	B	C	E	CA	Reference	Part number
3	DN16CF	I	C	48	76	102	73	87	TCC-3-C16	9312010
3	DN40CF	I	C	37	87	112	62	76	TCC-3-C40	9312031
3	DN16CF	I	E	48	76	102	73	87	TCE-3-C16	9312011
3	DN16CF	I	J	48	76	102	73	87	TCJ-3-C16	9312012
3	DN16CF	I	K	48	76	102	73	87	TCK-3-C16	9312013
3	DN40CF	I	K	37	87	112	62	76	TCK-3-C40	9312032

Air-side connector included at no extra cost

ISO KF



No. of pairs	Flange mount	End view figure	TC type	A	B	C	E	CA	Reference	Part number
3	DN16KF	2	C	48	76	102	73	87	TCC-3-K16	9313010
3	DN40CF	2	C	36	88	113	61	59	TCC-3-K40	9313031
3	DN16KF	2	E	48	76	102	73	87	TCE-3-K16	9313011
3	DN16KF	2	J	48	76	102	73	87	TCJ-3-K16	9313012
3	DN16KF	2	K	48	76	102	73	87	TCK-3-K16	9313013
3	DN40CF	2	K	36	88	113	61	59	TCK-3-K40	9313032

Air-side connector included at no extra cost

Weldable



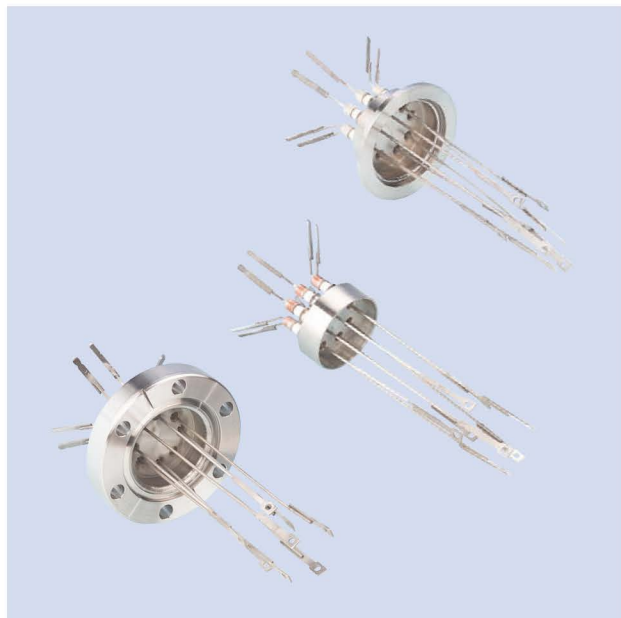
No. of pairs	End view figure	TC type	Reference	Part number
3	3	C	TCC-3	9311010
3	3	E	TCE-3	9311011
3	3	J	TCJ-3	9311012
3	3	K	TCK-3	9311013

Air-side connector included at no extra cost

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

# Thermocouple

Miniature connectors – 4 pairs



## Features

- TC design is compatible with standard miniature connectors
- TC types C, E, J and K are standard – type N available upon request
- Air-side connector included
- In-vacuum accessories available – see section 6.7
- Three standard vacuum mounting styles
- Custom feedthrough configurations available upon request

## Specifications

**Voltage<sup>1</sup>** mV

**Current** mA

### Material

Flanges 304ss

Shell 304ss

Pins See TC options

Insulation Alumina ceramic

**Vacuum range** UHV/HV  $1 \times 10^{-10}$  mbar /  $1 \times 10^{-8}$  mbar

### Temperature range<sup>2</sup>

CF Mounted feedthrough -100°C to 450°C

ISO KF Mounted feedthrough -20°C to 150°C

Weldable feedthrough -100°C to 450°C

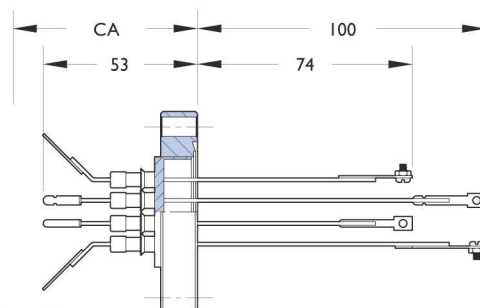
Air-side connector -65°C to 165°C

**Dimensions** Reference only, subject to change

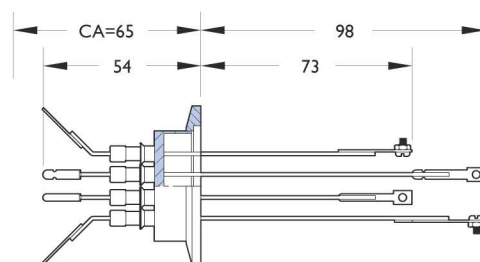
<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

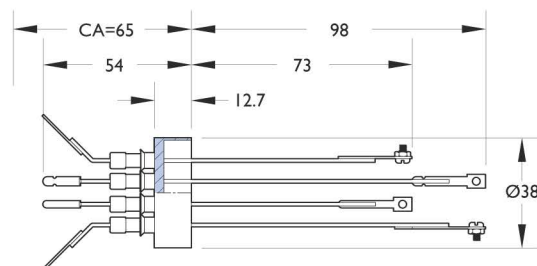
## UHV and HV series



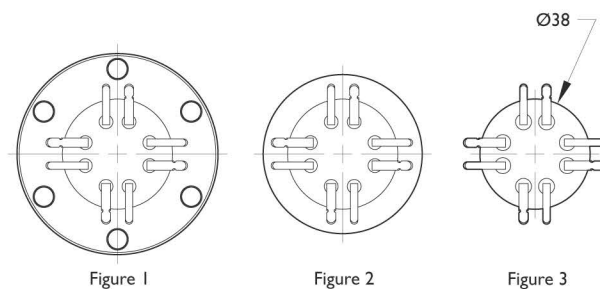
CF Mount



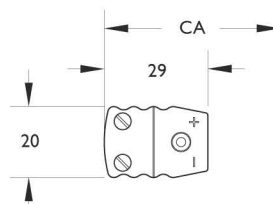
ISO KF Mount



Weldable



End view Air-side



Air-side connector

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

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Thermocouple

Miniature connectors – 4 pairs



Thermocouple

CF



Number of pairs	Flange mount	End view figure	TC type	Reference	Part number
4	DN40CF	I	C	TCC-4-C40	9312014
4	DN40CF	I	E	TCE-4-C40	9312015
4	DN40CF	I	J	TCJ-4-C40	9312016
4	DN40CF	I	K	TCK-4-C40	9312017

Air-side connector included at no extra cost

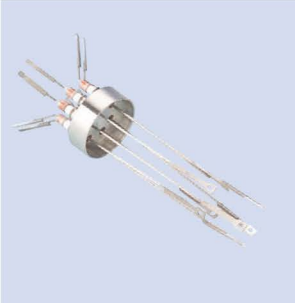
ISO KF



Number of pairs	Flange mount	End view figure	TC type	Reference	Part number
4	DN40KF	2	C	TCC-4-K40	9313014
4	DN40KF	2	E	TCE-4-K40	9313015
4	DN40KF	2	J	TCJ-4-K40	9313016
4	DN40KF	2	K	TCK-4-K40	9313017

Air-side connector included at no extra cost

Weldable



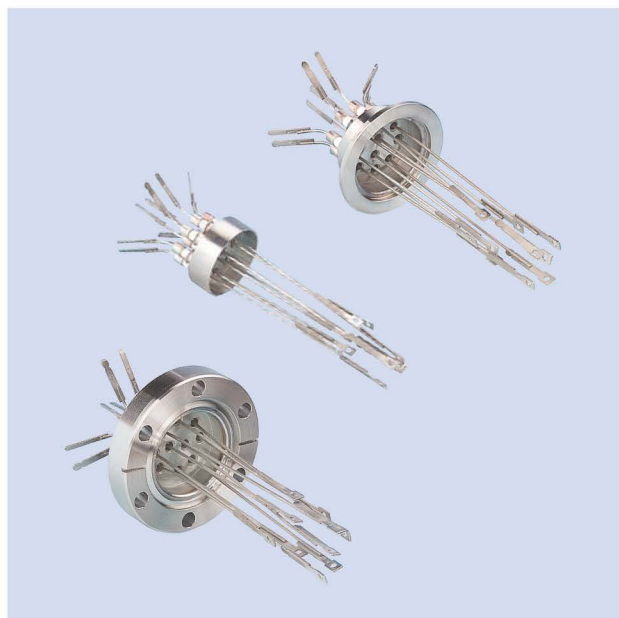
Number of pairs	End view figure	TC type	Reference	Part number
4	3	C	TCC-4	9311014
4	3	E	TCE-4	9311015
4	3	J	TCJ-4	9311016
4	3	K	TCK-4	9311017

Air-side connector included at no extra cost

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

# Thermocouple

Miniature connectors – 5 pairs



## Features

- TC design is compatible with standard miniature connectors
- TC types C, E, J and K are standard – type N available upon request
- Air-side connector included
- In-vacuum accessories available – see section 6.7
- Three standard vacuum mounting styles
- Custom feedthrough configurations available upon request

## Specifications

**Voltage<sup>1</sup>** mV

**Current** mA

### Material

Flanges 304ss

Shell 304ss

Pins See TC options

Insulation Alumina ceramic

**Vacuum range** UHV/HV  $1 \times 10^{-10}$  mbar /  $1 \times 10^{-8}$  mbar

### Temperature range<sup>2</sup>

CF Mounted feedthrough -100°C to 450°C

ISO KF Mounted feedthrough -20°C to 150°C

Weldable feedthrough -100°C to 450°C

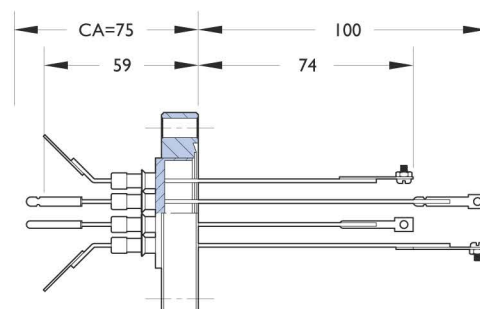
Air-side connector -65°C to 165°C

**Dimensions** Reference only, subject to change

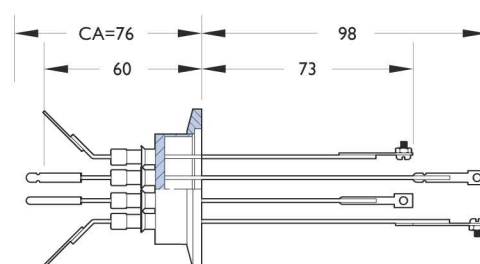
<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

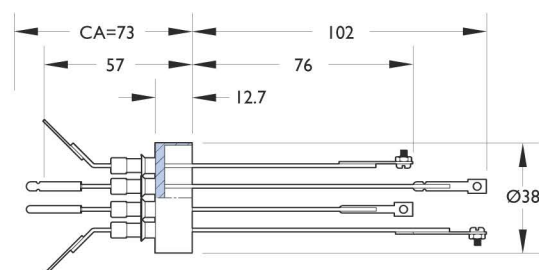
## UHV and HV series



CF Mount



ISO KF Mount



Weldable

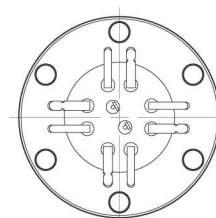


Figure 1

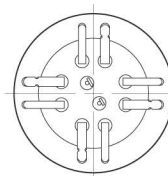


Figure 2

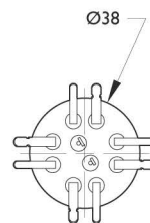
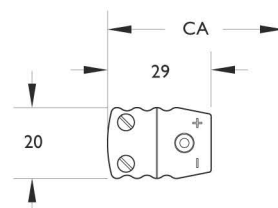


Figure 3

### End view Air-side



Air-side connector

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

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Thermocouple

Miniature connectors – 5 pairs



Thermocouple

CF



Number of pairs	Flange mount	End view figure	TC type	Reference	Part number
5	DN40CF	I	C	TCC-5-C40	9312018
5	DN40CF	I	E	TCE-5-C40	9312019
5	DN40CF	I	J	TCJ-5-C40	9312020
5	DN40CF	I	K	TCK-5-C40	9312021

Air-side connector included at no extra cost

ISO KF



Number of pairs	Flange mount	End view figure	TC type	Reference	Part number
5	DN40KF	2	C	TCC-5-K40	9313018
5	DN40KF	2	E	TCE-5-K40	9313019
5	DN40KF	2	J	TCJ-5-K40	9313020
5	DN40KF	2	K	TCK-5-K40	9313021

Air-side connector included at no extra cost

Weldable

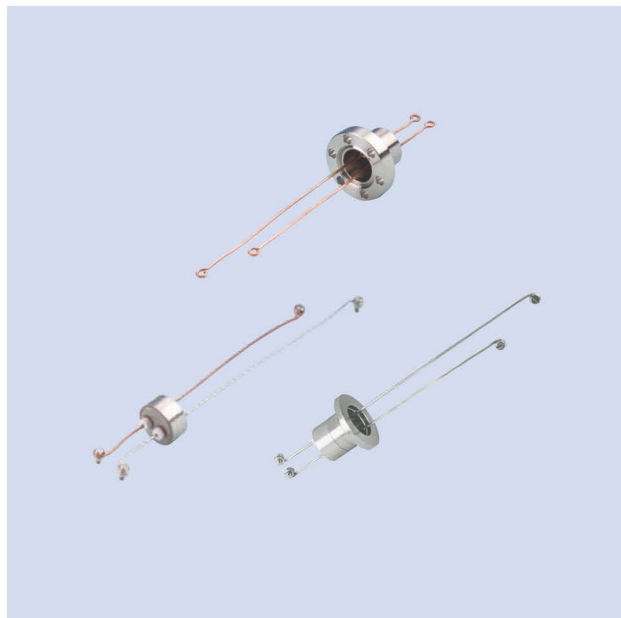


Number of pairs	End view figure	TC type	Reference	Part number
5	3	C	TCC-5	9311018
5	3	E	TCE-5	9311019
5	3	J	TCJ-5	9311020
5	3	K	TCK-5	9311021

Air-side connector included at no extra cost

# Thermocouple

Screw type connectors – 1 pair



## Features

- TC design is compatible with standard screw type connections
- TC types R, S and T are standard – type N available upon request
- In-vacuum accessories available – see section 6.7
- Standard vacuum mounting styles
- Custom feedthrough configurations available upon request

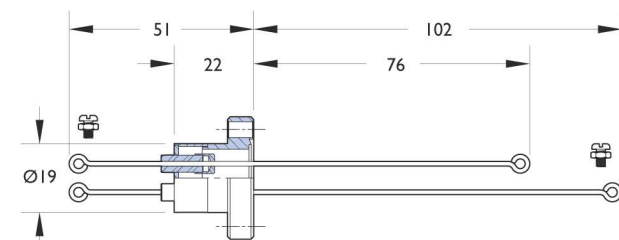
## Specifications

<b>Voltage<sup>1</sup></b>	mV
<b>Current</b>	mA
<b>Material</b>	
Flanges	304ss
Shell	304ss
Pins	See TC options
Insulation	Alumina ceramic
<b>Vacuum range</b> UHV/HV	$1 \times 10^{-10}$ mbar / $1 \times 10^{-8}$ mbar
<b>Temperature range<sup>2</sup></b>	
CF Mounted feedthrough	-100°C to 450°C
ISO KF Mounted feedthrough	-20°C to 150°C
Weldable feedthrough	-100°C to 450°C

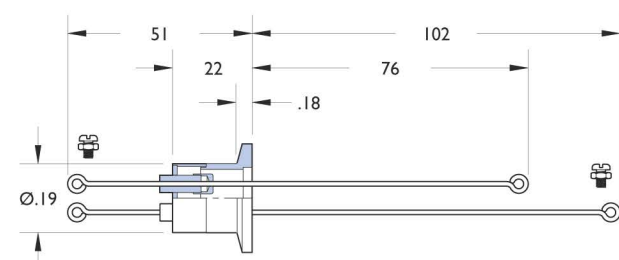
**Dimensions** Reference only, subject to change

<sup>1</sup> See intended operating parameters in introductory section  
<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

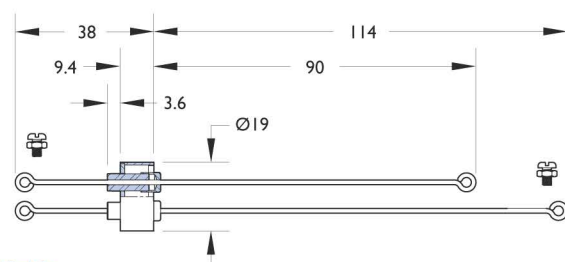
## UHV and HV series



CF Mount



ISO KF Mount



Weldable

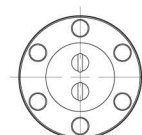


Figure 1

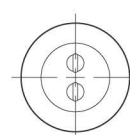


Figure 2

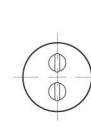


Figure 3

## End view Air-side

- Polarity for TC leads is (–) for longer lead and (+) for shorter lead

Thermocouple

Screw type connectors – I pair



Thermocouple

CF



Number of pairs	Flange mount	End view figure	TC type	Reference	Part number
I	DNI6CF	I	R&S	TCR/S-CI6	9322012
I	DNI6CF	I	T	TCT-CI6	9322013

Air-side connector included at no extra cost

ISO KF



Number of pins	Flange mount	End view	TC type	Reference	Part number
I	DNI6KF	3	R&S	TCR/S-KI6	9323012
I	DNI6KF	3	T	TCT-KI6	9323013

Weldable



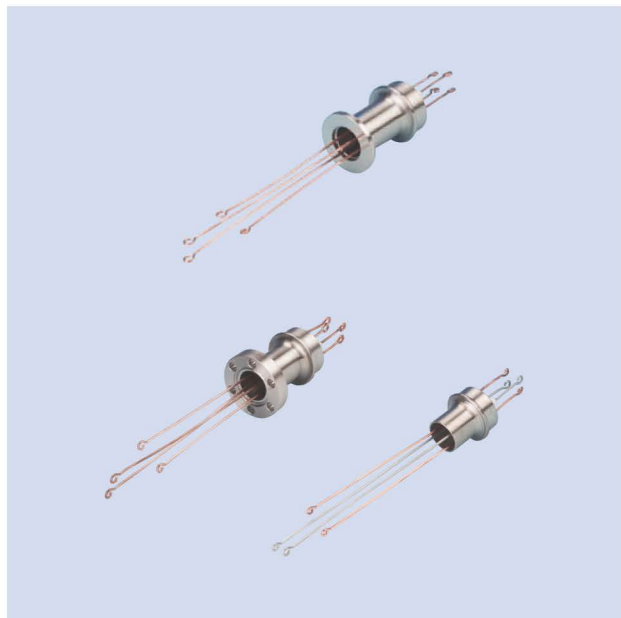
Number of pairs	End view figure	TC type	Reference	Part number
I	2	R&S	TCR/S	9321012
I	3	T	TCT	9321013

Air-side connector included at no extra cost

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

# Thermocouple

Screw type connectors – 2 pairs



## Features

- TC design is compatible with standard screw type connections
- TC types R, S and T are standard – type N available upon request
- In-vacuum accessories available – see section 6.7
- Three standard vacuum mounting styles
- Custom feedthrough configurations available upon request

## Specifications

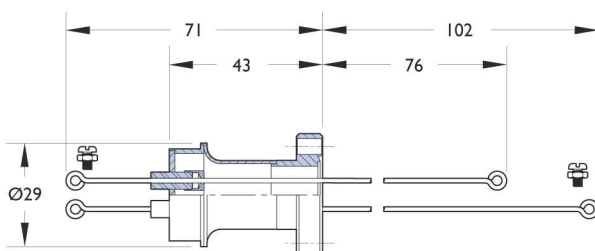
<b>Voltage<sup>1</sup></b>	mV
<b>Current</b>	mA
<b>Material</b>	
Flanges	304ss
Shell	304ss
Pins	See TC options
Insulation	Alumina ceramic
<b>Vacuum range</b> UHV/HV	$1 \times 10^{-10}$ mbar / $1 \times 10^{-8}$ mbar
<b>Temperature range<sup>2</sup></b>	
CF Mounted feedthrough	-100°C to 450°C
ISO KF Mounted feedthrough	-20°C to 150°C
Weldable feedthrough	-100°C to 450°C

**Dimensions** Reference only, subject to change

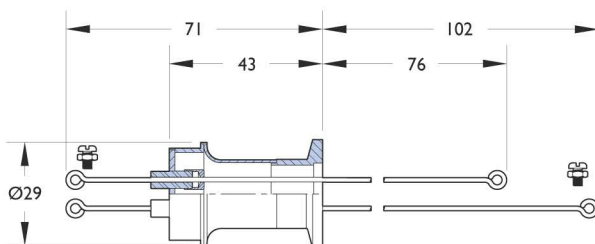
<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

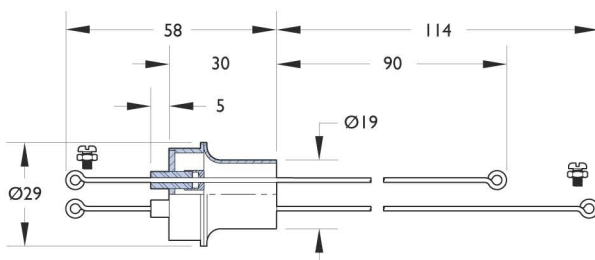
## UHV and HV series



CF Mount



ISO KF Mount



Weldable



Figure 1

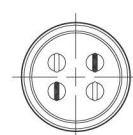


Figure 2

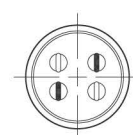


Figure 3

## End view Air-side

- Polarity for TC leads is (-) for longer lead and (+) for shorter lead

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

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 France +33 (0) 437 651 750 info@mdcvacuum.fr



Thermocouple

Screw type connectors – 2 pairs



Thermocouple

CF



Number of pairs	Flange mount	End view figure	TC type	Reference	Part number
2	DNI6CF	I	R&S	TCR/S-2-CI6	9322014
2	DNI6CF	I	T	TCT-2-CI6	9322015

Air-side connector included at no extra cost

ISO KF



Number of pairs	Flange mount	End view figure	TC type	Reference	Part number
2	DNI6KF	2	R&S	TCR/S-2-KI6	9323014
2	DNI6KF	2	T	TCT-2-KI6	9323015

Air-side connector included at no extra cost

Weldable

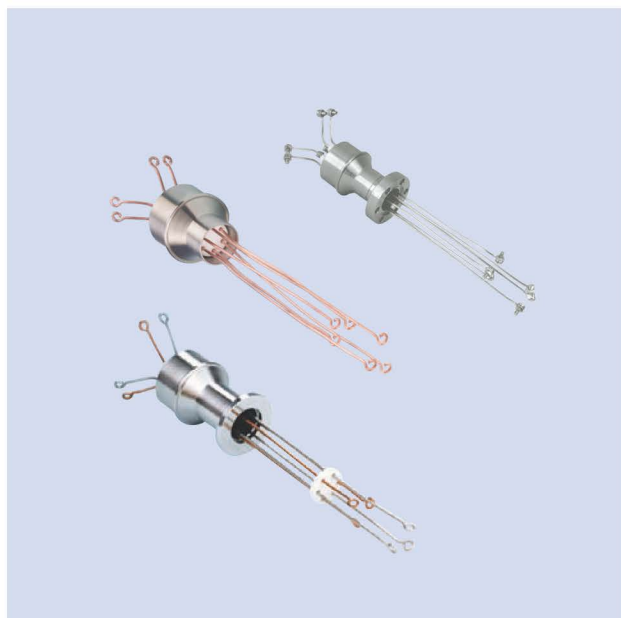


Number of pairs	Flange mount	End view figure	TC type	Reference	Part number
2		3	R&S	TCR/S-2	9321014
2		3	T	TCT-2	9321015

Air-side connector included at no extra cost

# Thermocouple

Screw type connectors – 3 pairs



## Features

- TC design is compatible with standard screw type connections
- TC types R, S and T are standard – type N available upon request
- In-vacuum accessories available – see section 6.7
- Standard vacuum mounting styles
- Custom feedthrough configurations available upon request

## Specifications

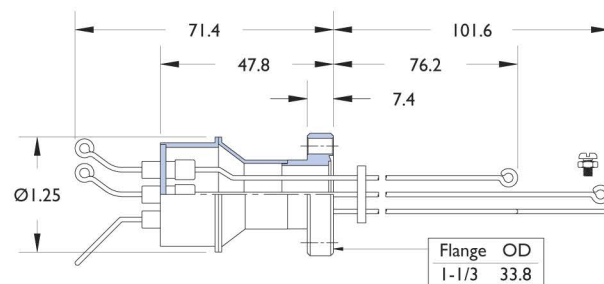
<b>Voltage<sup>1</sup></b>	mV
<b>Current</b>	mA
<b>Material</b>	
Flanges	304ss
Shell	304ss
Pins	See TC options
Insulation	Alumina ceramic
<b>Vacuum range</b> UHV/HV	$1 \times 10^{-10}$ mbar / $1 \times 10^{-8}$ mbar
<b>Temperature range<sup>2</sup></b>	
CF Mounted feedthrough	-100°C to 450°C
ISO KF Mounted feedthrough	-20°C to 150°C
Weldable feedthrough	-100°C to 450°C

**Dimensions** Reference only, subject to change

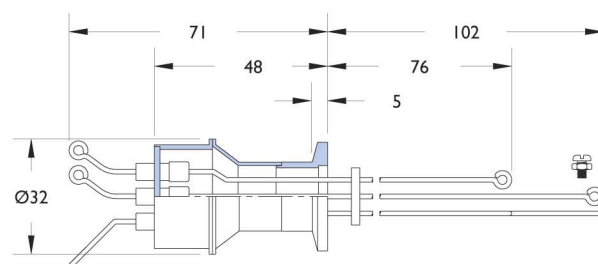
<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

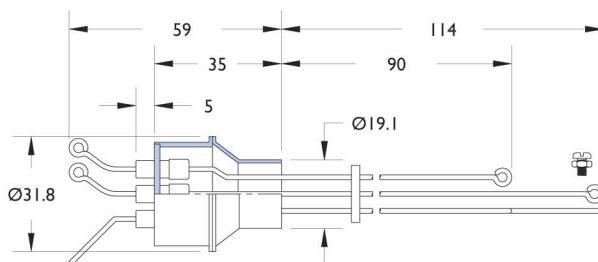
## UHV and HV series



CF Mount



ISO KF Mount



Weldable

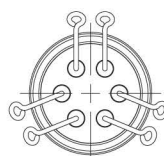


Figure 1

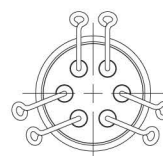


Figure 2

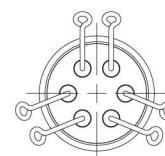


Figure 3

## End view Air-side

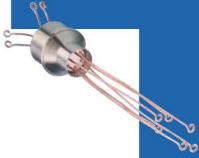
- Polarity for TC leads is (–) for longer lead and (+) for shorter lead

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

United Kingdom +44 (0) 1825 280 450 sales@mdcvacuum.co.uk  
 Germany +49 (0) 2305 947 508 sales@mdcvacuum.de  
 France +33 (0) 437 651 750 info@mdcvacuum.fr

Thermocouple

Screw type connectors – 3 pairs



Thermocouple

CF



Number of pairs	Flange mount	End view figure	TC type	Reference	Part number
3	DNI6CF	I	R&S	TCR/S-3-CI6	9322016
3	DNI6CF	I	T	TCT-3-CI6	9322017

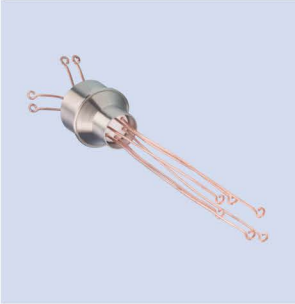
Air-side connector included at no extra cost

ISO KF



Number of pins	Flange mount	End view	TC type	Reference	Part number
3	DNI6KF	2	R&S	TCR/S-3-KI6	9323016
3	DNI6KF	2	T	TCT-3-KI6	9323017

Weldable

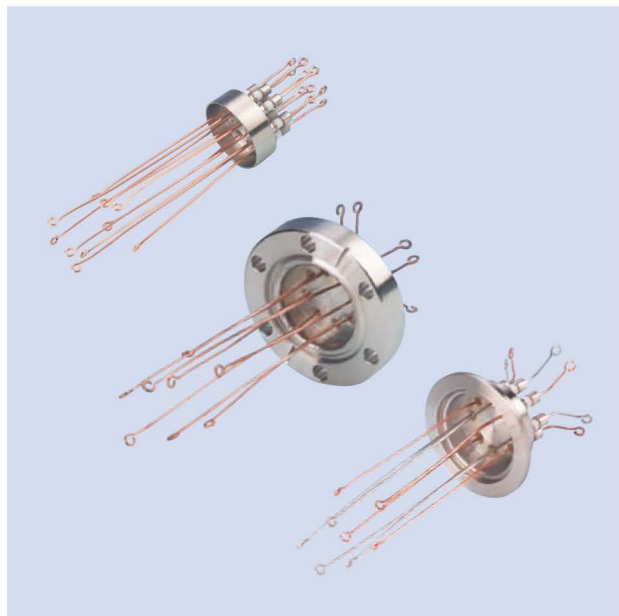


Number of pairs	End view figure	TC type	Reference	Part number
3	3	R&S	TCR/S-3	9321016
3	3	T	TCT-3	9321017

Air-side connector included at no extra cost

# Thermocouple

Screw type connectors – 4 pairs



## Features

- TC design is compatible with standard screw type connections
- TC types R, S and T are standard – type N available upon request
- In-vacuum accessories available – see section 6.7
- Three standard vacuum mounting styles
- Custom feedthrough configurations available upon request

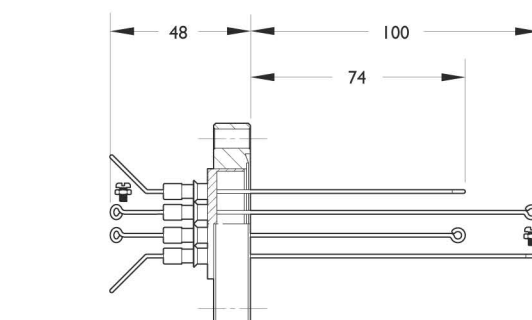
## Specifications

<b>Voltage<sup>1</sup></b>	mV
<b>Current</b>	mA
<b>Material</b>	
Flanges	304ss
Shell	304ss
Pins	See TC options
Insulation	Alumina ceramic
<b>Vacuum range</b> UHV/HV	$1 \times 10^{-10}$ mbar / $1 \times 10^{-8}$ mbar
<b>Temperature range<sup>2</sup></b>	
CF Mounted feedthrough	-100°C to 450°C
ISO KF Mounted feedthrough	-20°C to 150°C
Weldable feedthrough	-100°C to 450°C
<b>Dimensions</b>	Reference only, subject to change

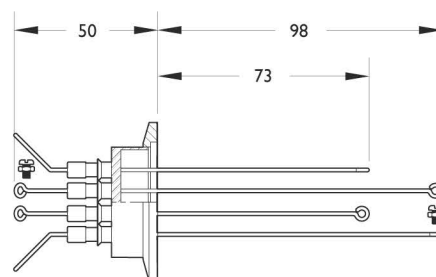
<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

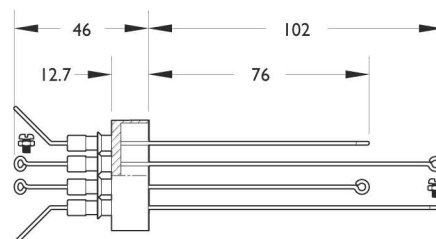
## UHV and HV series



CF Mount



ISO KF Mount



Weldable

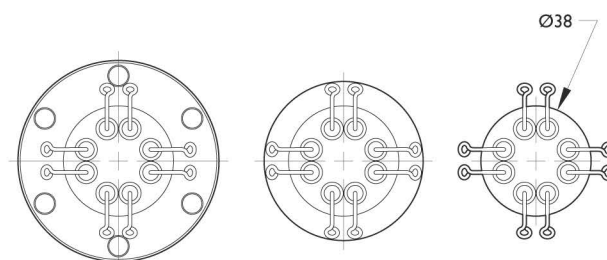


Figure 1

Figure 2

Figure 3

## Air-side connector

- Polarity for TC leads is (-) for longer lead and (+) for shorter lead

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

United Kingdom +44 (0) 1825 280 450 sales@mdcvacuum.co.uk  
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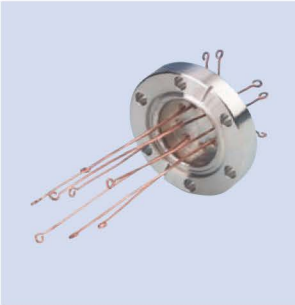
Thermocouple

Screw type connectors – 4 pairs



Thermocouple

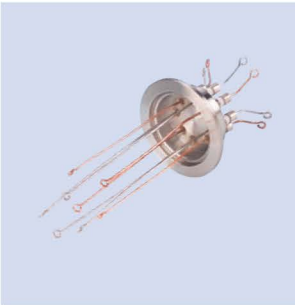
CF



Number of pairs	Flange mount	End view figure	TC type	Reference	Part number
4	DN40CF	I	R&S	TCR/S-4-C40	9322018
4	DN40CF	I	T	TCT-4-C40	9322019

Air-side connector included at no extra cost

ISO KF



Number of pairs	Flange mount	End view figure	TC type	Reference	Part number
4	DN40KF	2	R&S	TCR/S-4-K40	9323018
4	DN40KF	2	T	TCT-4-K40	9323019

Air-side connector included at no extra cost

Weldable



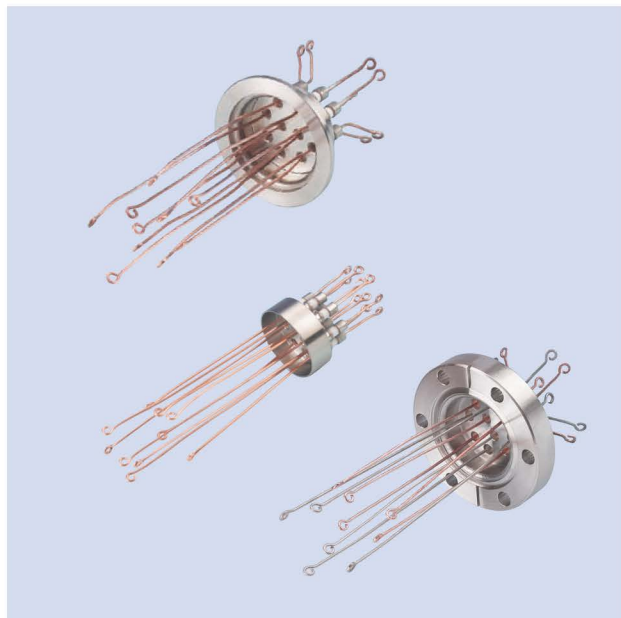
Number of pairs	End view figure	TC type	Reference	Part number
4	3	R&S	TCR/S-4	9321018
4	3	T	TCT-4	9321019

Air-side connector included at no extra cost

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

# Thermocouple

Screw type connectors – 5 pairs



## Features

- TC design is compatible with standard screw type connections
- TC types R, S and T are standard – type N available upon request
- In-vacuum accessories available – see section 6.7
- Standard vacuum mounting styles
- Custom feedthrough configurations available upon request

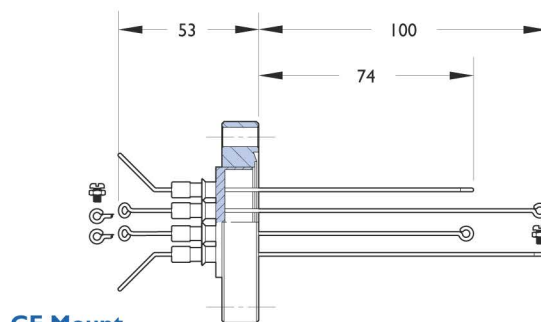
## Specifications

<b>Voltage<sup>1</sup></b>	mV
<b>Current</b>	mA
<b>Material</b>	
Flanges	304ss
Shell	304ss
Pins	See TC options
Insulation	Alumina ceramic
<b>Vacuum range</b> UHV/HV	$1 \times 10^{-10}$ mbar / $1 \times 10^{-8}$ mbar
<b>Temperature range<sup>2</sup></b>	
CF Mounted feedthrough	-100°C to 450°C
ISO KF Mounted feedthrough	-20°C to 150°C
Weldable feedthrough	-100°C to 450°C
<b>Dimensions</b>	Reference only, subject to change

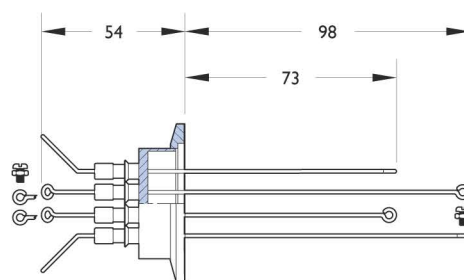
<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

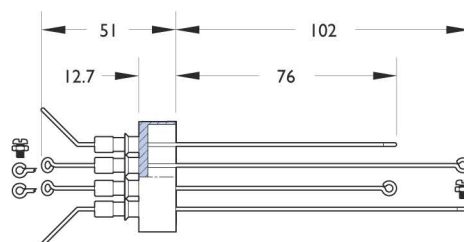
## UHV and HV series



CF Mount



ISO KF Mount



Weldable

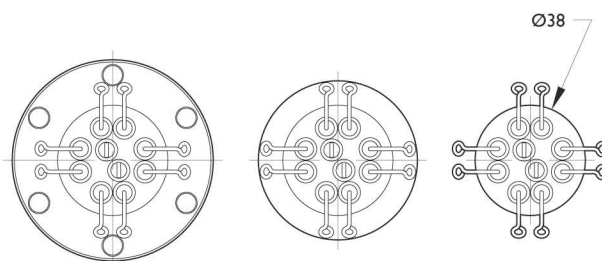


Figure 1

Figure 2

Figure 3

## Air-side connector

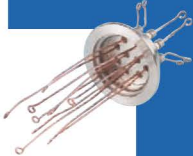
- Polarity for TC leads is (-) for longer lead and (+) for shorter lead

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

United Kingdom +44 (0) 1825 280 450 sales@mdcvacuum.co.uk  
 Germany +49 (0) 2305 947 508 sales@mdcvacuum.de  
 France +33 (0) 437 651 750 info@mdcvacuum.fr

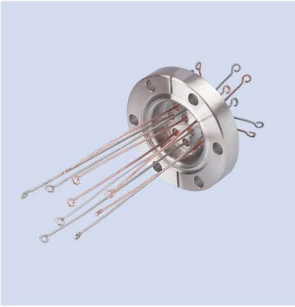
Thermocouple

Screw type connectors – 5 pairs



Thermocouple

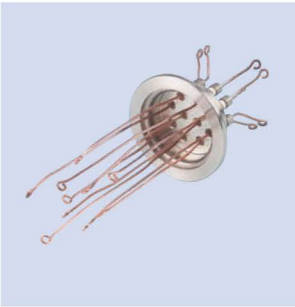
CF



Number of pairs	Flange mount	End view figure	TC type	Reference	Part number
5	DN40CF	I	R&S	TCR/S-5-C40	9322020
5	DN40CF	I	T	TCT-5-C40	9322021

Air-side connector included at no extra cost

ISO KF



Number of pairs	Flange mount	End view figure	TC type	Reference	Part number
5	DN40KF	2	R&S	TCR/S-5-K40	9323020
5	DN40KF	2	T	TCT-5-K40	9323021

Air-side connector included at no extra cost

Weldable



Number of pairs	End view figure	TC type	Reference	Part number
5	3	R&S	TCR/S-5	9321020
5	3	T	TCT-5	9321021

Air-side connector included at no extra cost

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



## Features

- TC design is compatible with standard threaded connectors
- TC type K is standard – types E and J available upon request
- Air-side connector included
- In-vacuum accessories available – see section 6.7
- Three standard vacuum mounting styles
- Custom feedthrough configurations available upon request
- Ceramic spacers available – see page 296

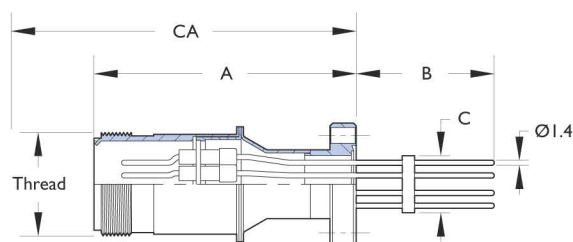
## Specifications

<b>Voltage<sup>1</sup></b>	mV
<b>Current</b>	mA
<b>Material</b>	
Flanges	304ss
Shell	304ss
Pins	See TC options
Insulation	Alumina ceramic
<b>Vacuum range</b> UHV/HV	$1 \times 10^{-10}$ mbar / $1 \times 10^{-8}$ mbar
<b>Temperature range<sup>2</sup></b>	
CF Mounted feedthrough	-100°C to 450°C
ISO KF Mounted feedthrough	-20°C to 150°C
Weldable feedthrough	-100°C to 450°C
Air-side connector	-65°C to 165°C
<b>Dimensions</b>	Reference only, subject to change

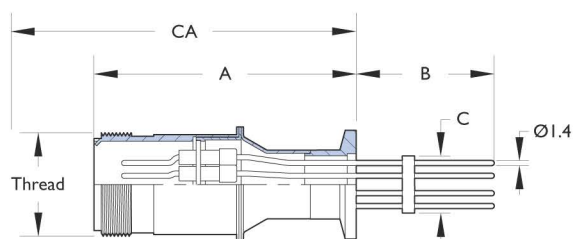
<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

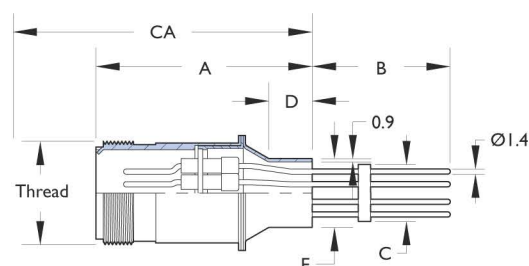
## UHV and HV series



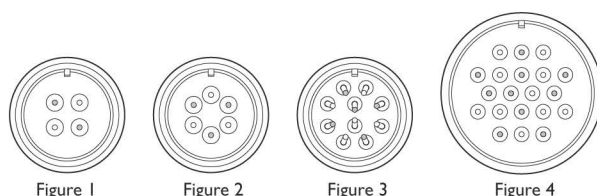
CF Mount



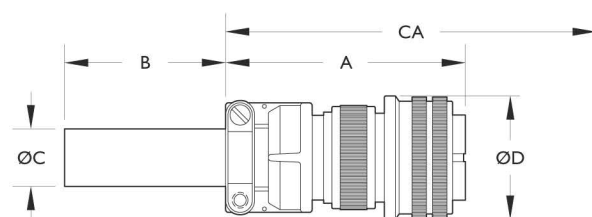
ISO KF Mount



Weldable



End view Air-side



Air-side connector

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

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Thermocouple

MS Connectors



Thermocouple

CF



No. of pairs	Flange mount	End view figure	TC type	A	B	C	Thread	CA	Reference	Part number
2	DN16CF	1	K	69	69	16	1/8"-18	115	MSK-2-C16	9332008
2	DN40CF	1	K	57	80	16	1/8"-18	104	MSK-2-C40	9332011
3	DN16CF	2	K	69	69	16	1/8"-18	115	MSK-3-C16	9332014
3	DN40CF	2	K	57	80	16	1/8"-18	104	MSK-3-C40	9332017
5	DN16CF	3	K	69	69	16	1/8"-18	115	MSK-5-C16	9332020
5	DN40CF	3	K	57	80	16	1/8"-18	104	MSK-5-C40	9332023
10	DN40CF	4	K	66	88	32	1/4"-18	123	MSK-10-C40	9332026

Air-side connector included at no extra cost

ISO KF



No. of pairs	Flange mount	End view figure	TC type	A	B	C	Thread	CA	Reference	Part number
2	DN16KF	1	K	69	69	16	1/8"-18	115	MSK-2-K16	9333008
2	DN40KF	1	K	56	81	16	1/8"-18	102	MSK-2-K40	9333011
3	DN16KF	2	K	69	69	16	1/8"-18	115	MSK-3-K16	9333014
3	DN40KF	2	K	56	81	16	1/8"-18	102	MSK-3-K40	9333017
5	DN16KF	3	K	69	69	16	1/8"-18	115	MSK-5-K16	9333020
5	DN40KF	3	K	56	81	16	1/8"-18	102	MSK-5-K40	9333023
10	DN40KF	4	K	64	89	32	1/4"-18	121	MSK10-K40	9333026

Air-side connector included at no extra cost

Weldable



No. of pairs	End view figure	TC type	A	B	C	D	E	Thread	CA	Reference	Part number
2	1	K	60	81	16	12	19	1/8"-18	102	MSK-2	9331008
3	2	K	60	81	16	12	19	1/8"-18	102	MSK-3	9331011
5	3	K	60	81	16	12	19	1/8"-18	102	MSK-5	9331014
10	4	K	60	89	32	19	35	1/4"-18	121	MSK-10	9331017

Air-side connector included at no extra cost

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



## Features

- TC design is compatible with standard threaded connectors
- TC type K is standard – types E and J available upon request
- Air-side connector included
- In-vacuum accessories available – see section 6.7
- Three standard vacuum mounting styles
- Custom feedthrough configurations available upon request

## Specifications

**Voltage<sup>1</sup>** mV

**Current** mA

### Material

Flanges 304ss

Shell 304ss

Pins See TC options

Insulation Alumina ceramic

**Vacuum range** UHV/HV  $1 \times 10^{-10}$  mbar /  $1 \times 10^{-8}$  mbar

### Temperature range<sup>2</sup>

CF Mounted feedthrough -100°C to 450°C

ISO KF Mounted feedthrough -20°C to 150°C

Weldable feedthrough -100°C to 450°C

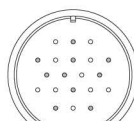
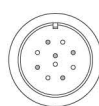
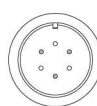
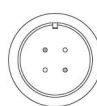
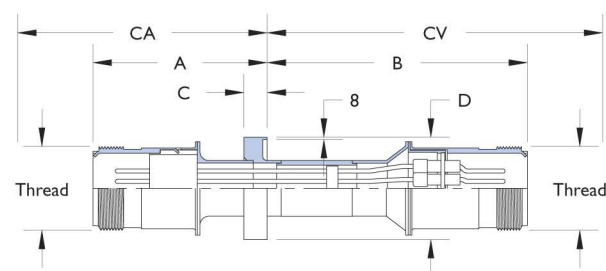
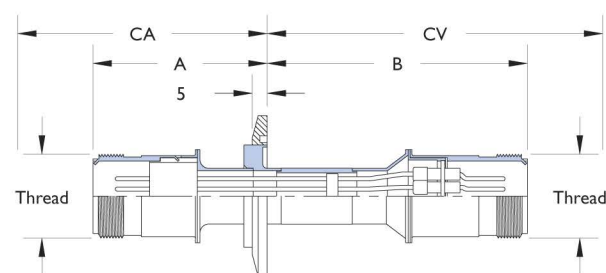
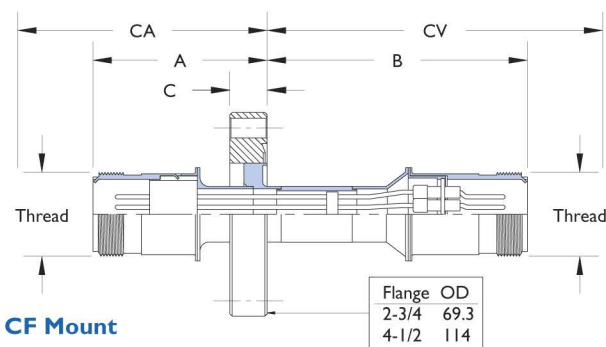
Air and vacuum-side connectors -100°C to 350°C

**Dimensions** Reference only, subject to change

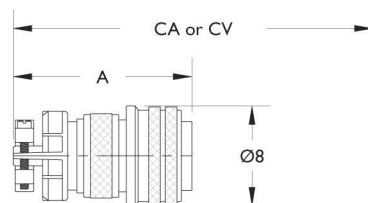
<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

## UHV Series



### End view Air-side



Thermocouple  
MS Connectors



Thermocouple

CF



End type	Flange mount	End view figure	TC type	A	B	Thread	CA	CV	Reference	Part number
2	DN40CF	1	K	61	87	1/8"-18	108	134	MSDK-2-C40	9332029
3	DN40CF	2	K	61	87	1/8"-18	108	134	MSDK-3-C40	9332032
5	DN40CF	3	K	61	87	1/8"-18	108	134	MSDK-5-C40	9332035
10	DN63CF	4	K	72	87	1/4"-18	129	145	MSDK-10-C63	9332038

Air-side connector included at no extra cost

ISO KF



End type	Flange mount	End view figure	TC type	A	B	Thread	CA	CV	Reference	Part number
2	DN40CF	1	K	62	86	1/8"-18	109	133	MSDK-2-K40	9333029
3	DN40CF	2	K	62	86	1/8"-18	109	133	MSDK-3-K40	9333035
5	DN40CF	3	K	62	86	1/8"-18	109	133	MSDK-5-K40	9333041

Air-side connector included at no extra cost

Weldable



No. of pairs	End view figure	TC type	A	B	C	D	Thread	CA	CV	Reference	Part number
2	1	K	60	89	8	35	1/8"-18	106	135	MSDK-2	9331020
3	2	K	60	89	8	35	1/8"-18	106	135	MSDK-3	9331023
5	3	K	60	89	8	35	1/8"-18	106	135	MSDK-5	9331026
10	4	K	71	89	9	63	1/4"-18	128	146	MSDK-10	9331029

Air-side connector included at no extra cost

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

# Thermocouple

Push-on connectors



## Features

- TC type K is standard – types E and J available upon request
- Air-side connector included
- In-vacuum accessories available – see section 6.7
- Three standard vacuum mounting styles
- Custom feedthrough configurations available upon request

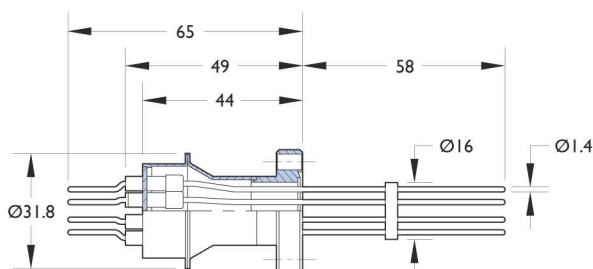
## Specifications

<b>Voltage<sup>1</sup></b>	mV
<b>Current</b>	mA
<b>Material</b>	
Flanges	304ss
Shell	304ss
Pins	See TC options
Insulation	Alumina ceramic
<b>Vacuum range</b> UHV/HV	$1 \times 10^{-10}$ mbar / $1 \times 10^{-8}$ mbar
<b>Temperature range<sup>2</sup></b>	
CF Mounted feedthrough	-100°C to 450°C
ISO KF Mounted feedthrough	-20°C to 150°C
Weldable feedthrough	-100°C to 450°C
<b>Dimensions</b>	Reference only, subject to change

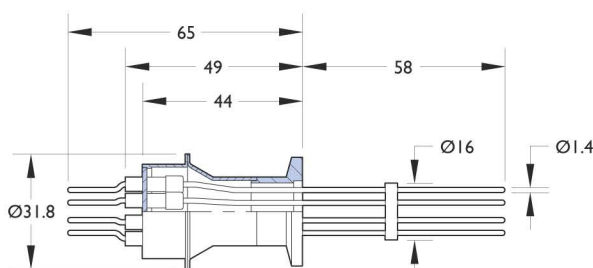
<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

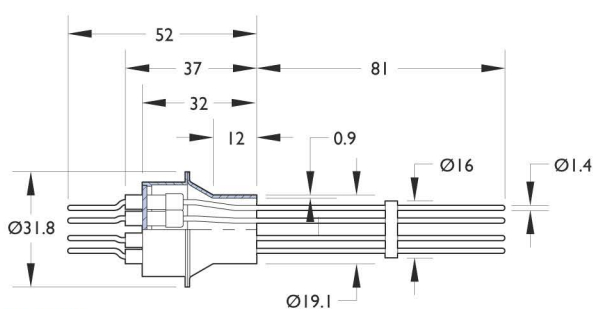
## UHV and HV series



CF Mount



ISO KF Mount



Weldable

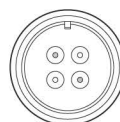


Figure 1

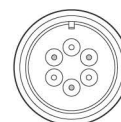


Figure 2

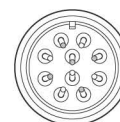


Figure 3

End view Air-side

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

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Thermocouple

Push-on connectors



Thermocouple

CF



Number of pairs	Flange mount	End view figure	TC type	Reference	Part number
2	DN I6CF	1	K	MTCK-2-CI6	9342006
3	DN I6CF	2	K	MTCK-3-CI6	9342009
5	DN I6CF	3	K	MTCK-5-CI6	9342012

Air-side connector included at no extra cost

ISO KF



Number of pairs	Flange mount	End view figure	TC type	Reference	Part number
2	DN I6KF	1	K	MTCK-2-KI6	9343002
3	DN I6KF	2	K	MTCK-3-KI6	9343005
5	DN I6KF	3	K	MTCK-5-KI6	9343008

Air-side connector included at no extra cost

Weldable



Number of pairs	End view figure	TC type	Reference	Part number
2	1	K	MTCK-2	9341002
3	2	K	MTCK-3	9341005
5	3	K	MTCK-5	9341008

Air-side connector included at no extra cost

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

# Thermocouple

TC Power



## Features

- Feedthrough combines TC and Power features
- TC type K is standard – types C, E and J available upon request
- Air and vacuum-side connectors included
- In-vacuum accessories available – see section 6.7
- Three standard vacuum mounting styles
- Custom feedthrough configurations available upon request

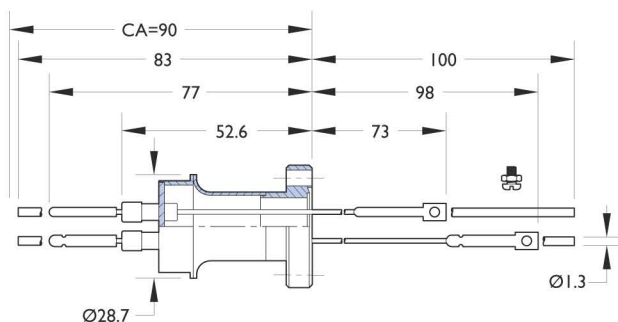
## Specifications

<b>Voltage<sup>1</sup></b>	1,000V DC maximum
<b>Current</b>	See table
<b>Material</b>	
Flanges	304ss
Shell	304ss
Pins	See TC options
Insulation	Alumina ceramic
<b>Vacuum range UHV</b>	$1 \times 10^{-10}$ mbar
<b>Temperature range<sup>2</sup></b>	
CF Mounted feedthrough	-100°C to 450°C
Air-side connector	-65°C to 125°C
<b>Dimensions</b>	Reference only, subject to change

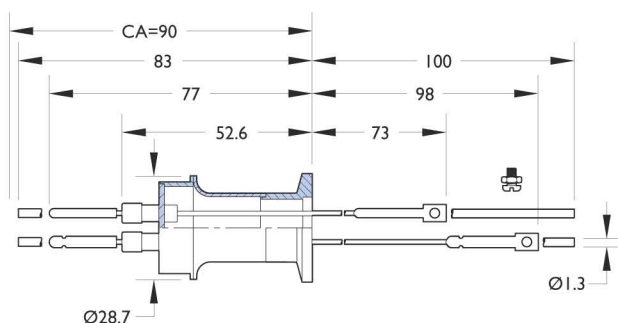
<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

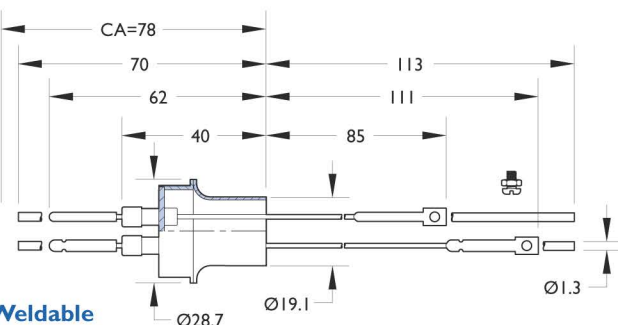
## UHV and HV series



CF Mount



ISO KF Mount



Weldable

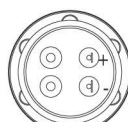


Figure 1

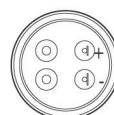


Figure 2

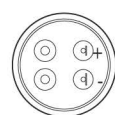
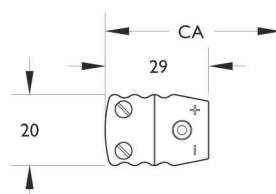


Figure 3

## End view Air-side



Air-side connector

■ Polarity for TC leads is (–) for longer lead and (+) for shorter lead

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

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Thermocouple

TC Power



Thermocouple

CF



No. of TC pairs	No. of power leads	Amps	Conductor material	Flange mount	End view figure	TC type	Reference	Part number
I	2	5	Nickel	DN16CF	I	K	TCK-5N-CI6	9392003
I	2	15	Copper	DN16CF	I	K	TCK-15C-CI6	9392007

Air and vacuum-side connectors included at no extra cost

ISO KF



No. of TC pairs	No. of power leads	Amps	Conductor material	Flange mount	End view figure	TC type	Reference	Part number
I	2	5	Nickel	DN16KF	2	K	TCK-5N-KI6	9393003
I	2	15	Copper	DN16KF	2	K	TCK-15C-KI6	9393007

Air and vacuum-side connectors included at no extra cost

Weldable



No. of TC pairs	No. of power leads	Amps	Conductor material	End view figure	TC type	Reference	Part number
I	2	5	Nickel	3	K	TCK-5N	9391003
I	2	15	Copper	3	K	TCK-15C	9391007

Air and vacuum-side connectors included at no extra cost

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

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+ 33 (0) 437 651 750

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# Thermocouple

TC Power



## Features

- Feedthrough combines TC and Power features
- TC type K is standard – types C, E and J available upon request
- Air and vacuum-side connectors included
- In-vacuum accessories available – see section 6.7
- Three standard vacuum mounting styles
- Custom feedthrough configurations available upon request

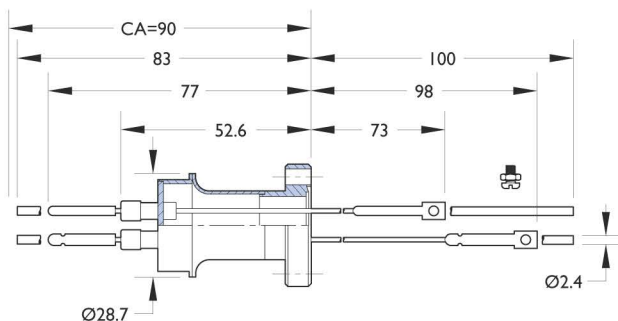
## Specifications

<b>Voltage<sup>1</sup></b>	5,000V DC maximum
<b>Current</b>	See table
<b>Material</b>	
Flanges	304ss
Shell	304ss
Pins	See TC options
Insulation	Alumina ceramic
<b>Vacuum range</b> UHV/HV	$1 \times 10^{-10}$ mbar / $1 \times 10^{-8}$ mbar
<b>Temperature range<sup>2</sup></b>	
CF Mounted feedthrough	-100°C to 450°C
ISO KF Mounted feedthrough	-20°C to 150°C
Weldable feedthrough	-100°C to 450°C
Air-side connector	-65°C to 125°C
<b>Dimensions</b>	Reference only, subject to change

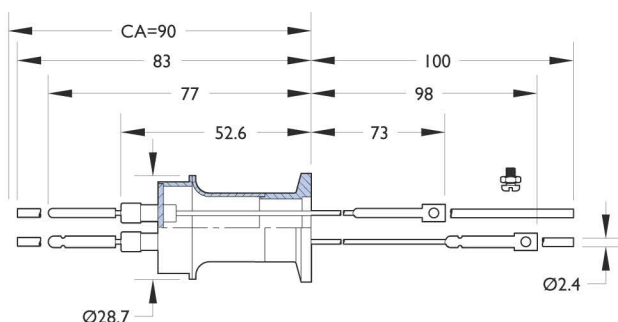
<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

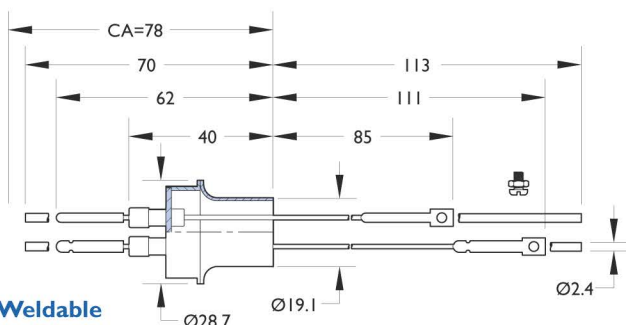
## UHV and HV series



CF Mount



ISO KF Mount



Weldable

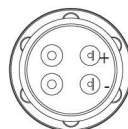


Figure 1

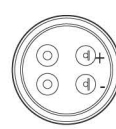


Figure 2

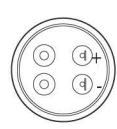
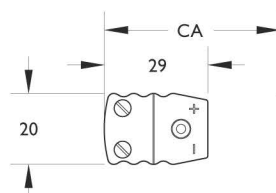


Figure 3

End view Air-side



Air-side connector

- Polarity for TC leads is (-) for longer lead and (+) for shorter lead

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Thermocouple

TC Power



Thermocouple

CF



No. of TC pairs	No. of power leads	Amps	Conductor material	Flange mount	End view figure	TC type	Reference	Part number
I	2	15	Nickel	DN16CF	I	K	TCK-15N-CI6	9392011
I	2	30	Copper	DN16CF	I	K	TCK-30C-CI6	9392015

Air and vacuum-side connectors included at no extra cost

ISO KF



No. of TC pairs	No. of power leads	Amps	Conductor material	Flange mount	End view figure	TC type	Reference	Part number
I	2	15	Nickel	DN16KF	2	K	TCK-15N-KI6	9393011
I	2	30	Copper	DN16KF	2	K	TCK-30C-KI6	9393015

Air and vacuum-side connectors included at no extra cost

Weldable



No. of TC pairs	No. of power leads	Amps	Conductor material	End view figure	TC type	Reference	Part number
I	2	15	Nickel	3	K	TCK-15N	9391011
I	2	30	Copper	3	K	TCK-30C	9391015

Air and vacuum-side connectors included at no extra cost



## Features

- Feedthrough combines TC and Power features
- TC type K is standard – types C, E and J available upon request
- Air and vacuum-side connectors included
- In-vacuum accessories available
- Custom feedthrough configurations available upon request

## Specifications

<b>Voltage<sup>1</sup></b>	5,000V DC maximum
<b>Current</b>	See table
<b>Material</b>	
Flanges	304ss
Shell	304ss
Pins	See TC options
Insulation	Alumina ceramic
<b>Vacuum range UHV</b>	$1 \times 10^{-10}$ mbar
<b>Temperature range<sup>2</sup></b>	
CF Mounted feedthrough	-100°C to 450°C
Air-side connector	-65°C to 125°C
<b>Dimensions</b>	Reference only, subject to change

<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

## UHV

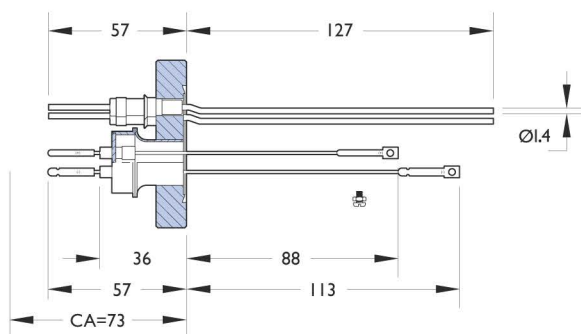


Figure 1

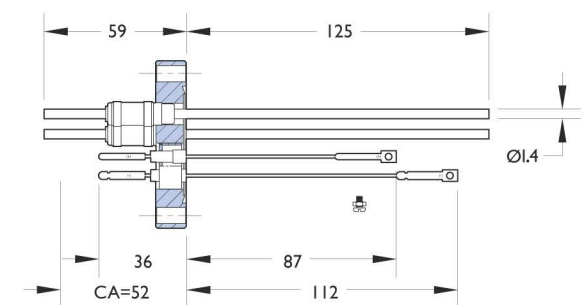


Figure 2

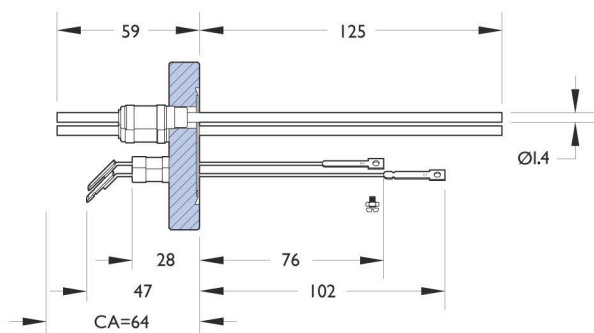
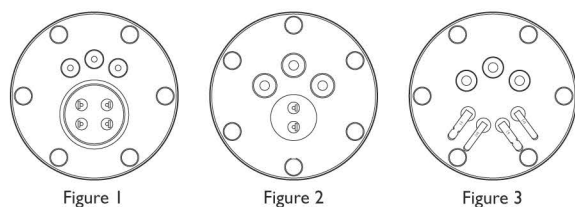
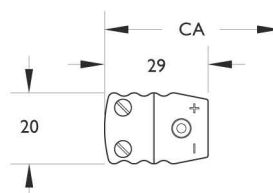


Figure 3



## End view Air-side



## Air-side connector

- Polarity for TC leads is (-) for longer lead and (+) for shorter lead

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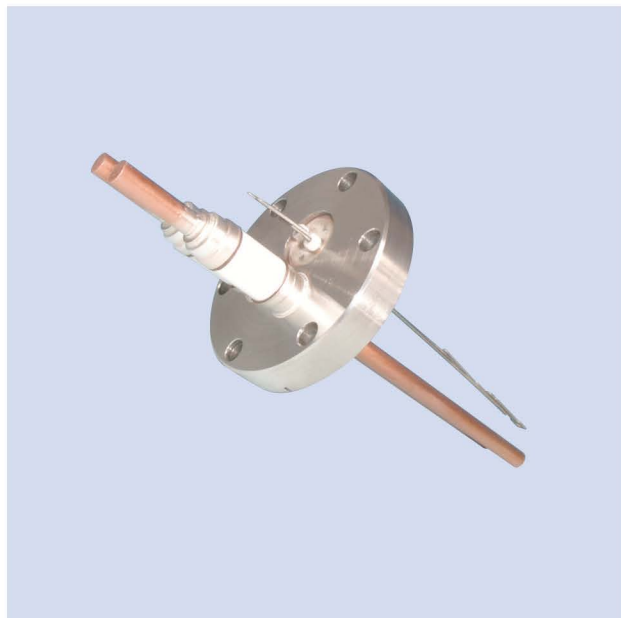
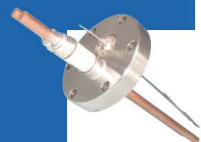


CF



No. of TC pairs	No. of power leads	Amps	Conductor material	Flange mount	End view figure	TC type	Reference	Part number
2	3	30	Copper	DN40CF	1	K	TCK-2-30C-3-C40	9392019
1	3	60	Copper	DN40CF	2	K	TCK-60C-3-C40	9392023
2	3	60	Copper	DN40CF	3	K	TCK-2-60C-3-C40	9392035

Air and vacuum-side connectors included at no extra cost



## Features

- Feedthrough combines TC and Power features
- TC type K is standard – types C, E and J available upon request
- Air-side connector included
- In-vacuum accessories available – see section 6.7
- Custom feedthrough configurations available upon request

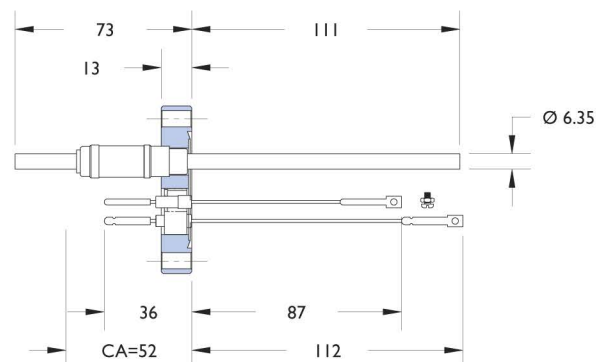
## Specifications

<b>Voltage<sup>1</sup></b>	5,000V DC maximum
<b>Current</b>	See table
<b>Material</b>	
Flanges	304ss
Shell	304ss
Pins	See TC options
Insulation	Alumina ceramic
<b>Vacuum range UHV</b>	$1 \times 10^{-10}$ mbar
<b>Temperature range<sup>2</sup></b>	
CF Mounted feedthrough	-100°C to 450°C
Air-side connector	-65°C to 125°C
<b>Dimensions</b>	Reference only, subject to change

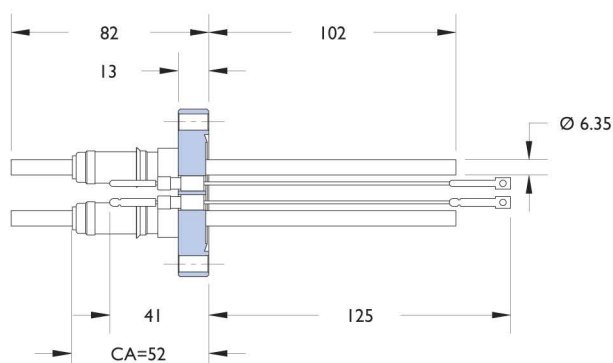
<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

## UHV



Item 1



Item 2

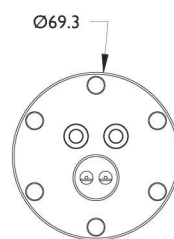


Figure 1

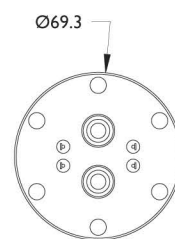
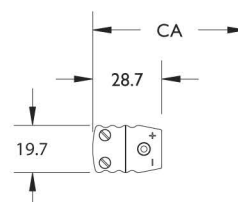


Figure 2

## End view Air-side



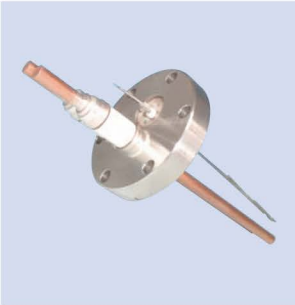
## Air-side connector

- Polarity for TC leads is (-) for longer lead and (+) for shorter lead



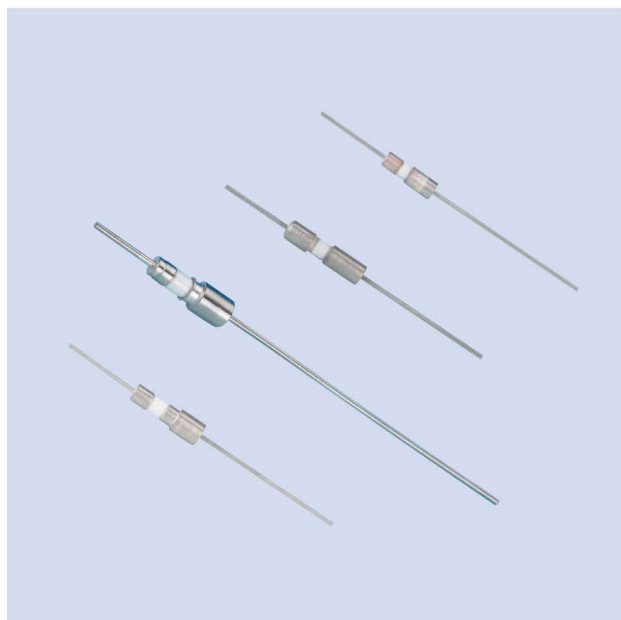


CF



No. of TC pairs	No. of power leads	Amps	Conductor material	Flange mount	End view figure	TC type	Reference	Part number
1	2	150	Copper	DN40CF	1	K	TCK-150C-C40	9392027
2	2	150	Copper	DN40CF	2	K	TCK-150-2-C40	9392031

Air and vacuum-side connectors included at no extra cost



## Features

- Single-pin construction
- Low power
- 5 different conductor materials available
- In-vacuum accessories available – see section 6.7
- Custom feedthrough configurations available upon request

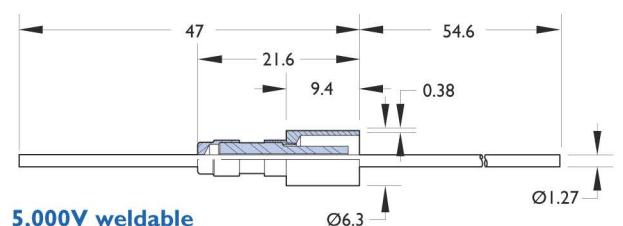
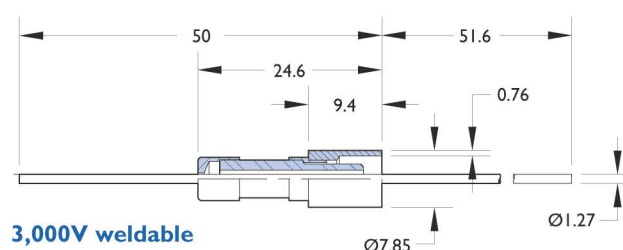
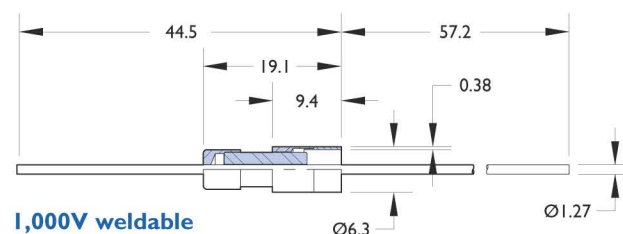
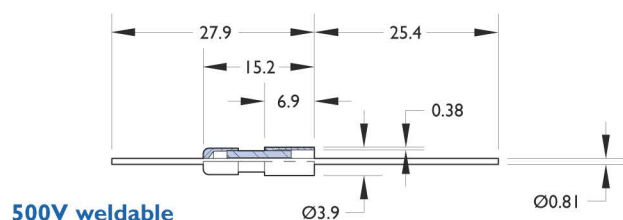
## Specifications

<b>Voltage<sup>1</sup></b>	500 – 5,000V DC maximum
<b>Current</b>	mA to 30A
<b>Material</b>	
Shell	See tables for options
Pins	See tables for options
Insulation	Alumina ceramic
<b>Vacuum range UHV</b>	$1 \times 10^{-10}$ mbar
<b>Temperature range<sup>2</sup></b>	
Weldable feedthrough	-200°C to 450°C
<b>Dimensions</b>	Reference only, subject to change

<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

## UHV Series



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

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500 to 5,000V / to 15A / 1 pin

Weldable

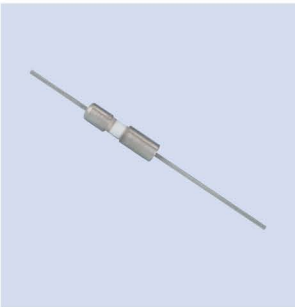


Volts	Amps	Adaptor	Conductor material	Reference	Part number
500	10	Nickel	Molybdenum	HV-10M	9411000
500	3	Nickel	Copper	HV-3C	9411001
500	2	Nickel	Nickel	HV-2N	9411002
500	*	Nickel	Stainless steel	HV-S	9411003
500	3	Nickel	Copper	CHV-3C	9411004
500	2	Nickel	Constantan	CHV-2N	9411005
500	*	Nickel	Stainless steel	CHV-S	9411006

\* Instrumentation current only.

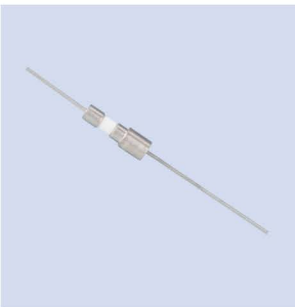
 Part numbers printed in light blue indicate products that are suitable for -200°C cryogenic applications

Weldable



Volts	Amps	Conductor material	Reference	Part number
1000	15	Copper	HV1-15C	9411018
1000	5	Nickel	HV1-5N	9411019
1000	1	Stainless steel	HV1-1S	9411020

Weldable



Volts	Amps	Conductor material	Reference	Part number
3000	15	Copper	HV3-15C	9421020
3000	5	Nickel	HV3-5N	9421021
3000	1	Stainless steel	HV3-1S	9421022

Weldable



Volts	Amps	Conductor material	Reference	Part number
5000	15	Copper	HV5-15C	9421007
5000	5	Nickel	HV5-5N	9421008
5000	1	Stainless steel	HV5-1S	9421009

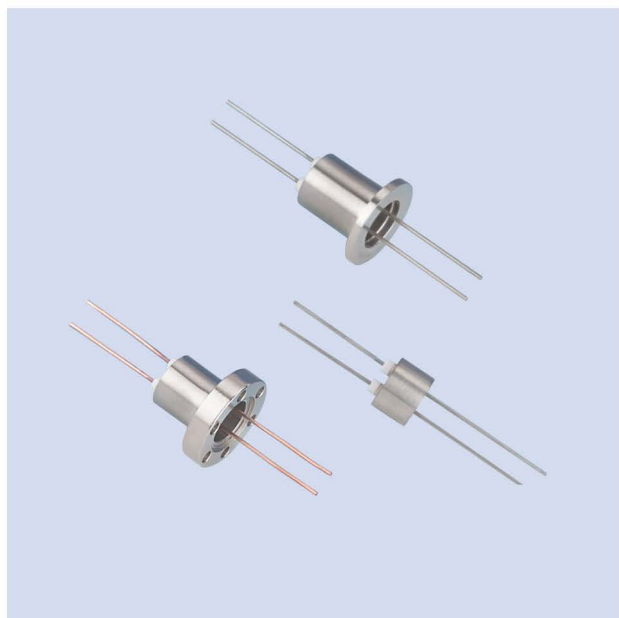
Connectors must be ordered separately

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

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## Power Low

500 to 1,000V / to 15A / 2 pins



## Features

- 2-pin construction
- Low power
- 4 different conductor materials available
- In-vacuum accessories available – see section 6.7
- 3 standard vacuum mounting styles
- Custom feedthrough configurations available upon request

## Specifications

**Voltage<sup>1</sup>** 500 – 1,000V DC maximum**Current** to 15A**Material**

Flanges 304ss

Shell 304ss

Pins See tables for options

Insulation Alumina ceramic

**Vacuum range** UHV/HV  $1 \times 10^{-10}$  mbar /  $1 \times 10^{-8}$  mbar**Temperature range<sup>2</sup>**

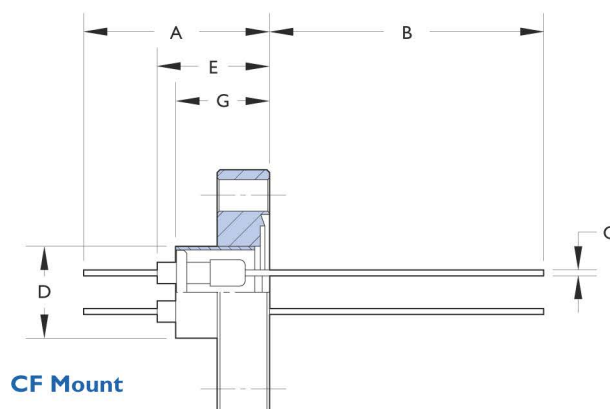
CF Flange mounted feedthrough -100°C to 450°C

ISO KF Flange mounted feedthrough -20°C to 150°C

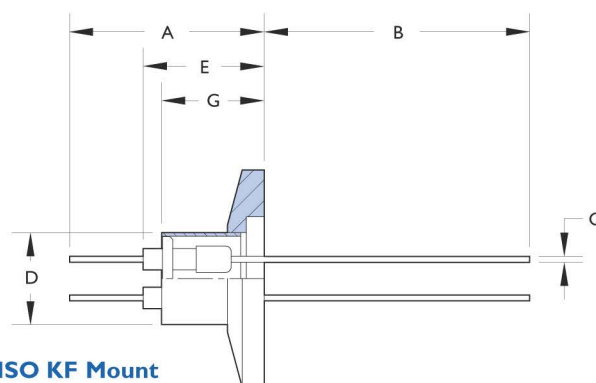
Weldable feedthrough -100°C to 450°C

**Dimensions** Reference only, subject to change<sup>1</sup> See intended operating parameters in introductory section.<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component.

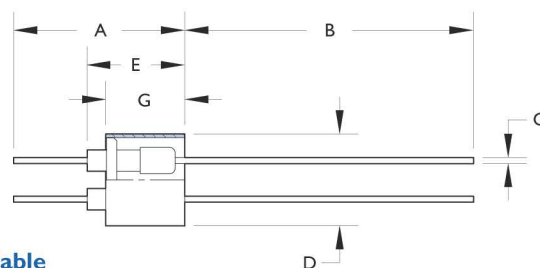
## UHV and HV series



CF Mount



ISO KF Mount



Weldable

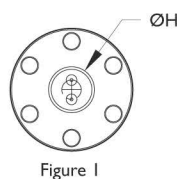


Figure 1

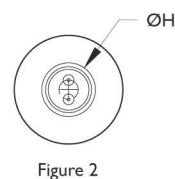


Figure 2

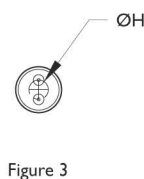


Figure 3

End view Air-side

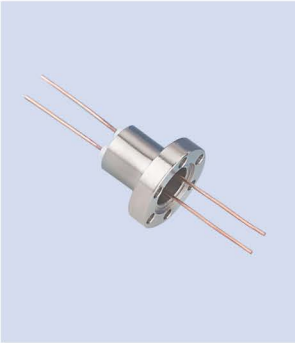
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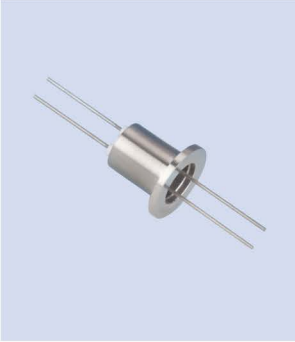
CF



Volts	Amps	Conductor material	End view fig.	A	B	C	D	E	G	H	Reference	Part number
DNI6CF Flange mount												
500	10	Molybdenum	I	25	39	0.8	14.7	12	13	5.3	HV-10M-2-CI6	9412000
500	3	Copper	I	25	39	0.8	14.7	12	13	5.3	HV-3C-2-CI6	9412001
1000	15	Copper	I	67	35	1.3	29.7	26	19	7.8	HVI-15C-2-CI6	9412011
500	2	Nickel	I	25	39	0.8	14.7	12	13	5.3	HV-2N-2-CI6	9412002
1000	5	Nickel	I	67	35	1.3	29.7	26	19	7.8	HVI-5N-2-CI6	9412012
500	*	Stainless steel	I	25	39	0.8	14.7	12	13	5.3	HV-S-2-CI6	9412003
1000	I	Stainless steel	I	69	35	1.3	29.7	26	19	7.8	HVI-IS-2-CI6	9412013

\* Instrumentation current only  
Connectors must be ordered separately

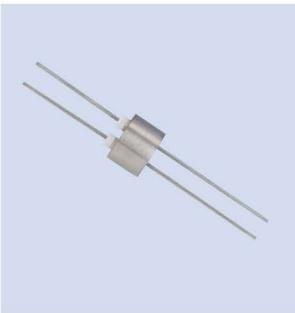
ISO KF



Volts	Amps	Conductor material	End view fig.	A	B	C	D	E	G	H	Reference	Part number
DNI6KF Flange mount												
500	10	Molybdenum	2	26	37	0.8	16.0	13	13	5.3	HV-10M-2-KI6	9413000
500	3	Copper	2	26	37	0.8	16.0	13	13	5.3	HV-3C-2-KI6	9413001
1000	15	Copper	2	67	35	1.3	29.7	26	19	7.8	HVI-15C-2-KI6	9413011
500	2	Nickel	2	26	37	0.8	16.0	13	13	5.3	HV-2N-2-KI6	9413002
1000	5	Nickel	2	67	35	1.3	29.7	26	19	7.8	HVI-5N-2-KI6	9413012
500	*	Stainless steel	2	26	37	0.8	16.0	13	13	5.3	HV-S-2-KI6	9413003
1000	I	Stainless steel	2	67	35	1.3	29.7	26	19	7.8	HVI-IS-2-KI6	9413013

\* Instrumentation current only  
Connectors must be ordered separately

Weldable



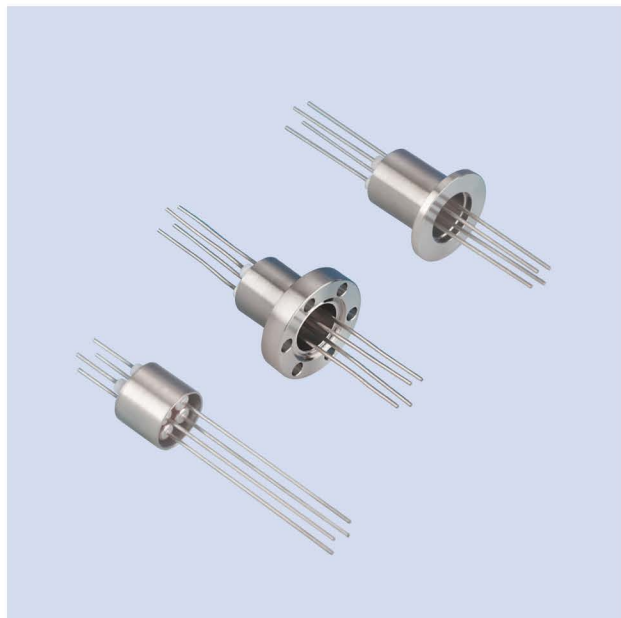
Volts	Amps	Conductor material	End view fig.	A	B	C	D	E	G	H	Reference	Part number
500	10	Molybdenum	3	24	40	0.8	12.7	12	11	5.3	HV-10M-2	9411007
500	3	Copper	3	24	40	0.8	12.7	13	11	5.3	HV-3C-2	9411008
1000	15	Copper	3	54	48	1.27	19.0	17	13	7.8	HVI-15C-2	9411021
500	2	Nickel	3	24	40	0.8	12.7	13	11	5.3	HV-2N-2	9411009
1000	5	Nickel	3	54	48	1.27	19.0	17	13	7.8	HVI-5N-2	9411022
500	*	Stainless steel	3	24	40	0.8	12.7	13	11	5.3	HV-S-2	9411010
1000	I	Stainless steel	3	54	48	1.27	19.0	17	13	7.8	HVI-IS-2	9411023

\* Instrumentation current only  
Connectors must be ordered separately

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

## Power Low

500 to 1,000V / to 15A / 4 pins



## Features

- 4-pin construction
- Low power
- 4 different conductor materials available
- In-vacuum accessories available – see section 6.7
- 3 standard vacuum mounting styles
- Custom feedthrough configurations available upon request

## Specifications

**Voltage<sup>1</sup>** 500 – 1,000V DC maximum

**Current** to 15A

## Material

Flanges 304ss

Shell 304ss

Pins See tables for options

Insulation Alumina ceramic

**Vacuum range** UHV/HV  $1 \times 10^{-10}$  mbar /  $1 \times 10^{-8}$  mbar

Temperature range<sup>2</sup>

CF Flange mounted feedthrough -100°C to 450°C

ISO KF Flange mounted feedthrough -20°C to 150°C

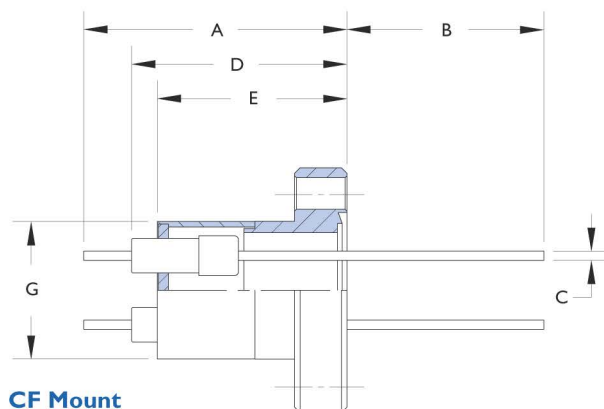
Weldable feedthrough -100°C to 450°C

**Dimensions** Reference only, subject to change

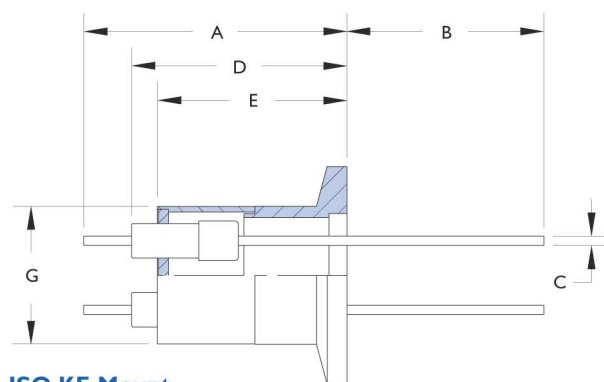
<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

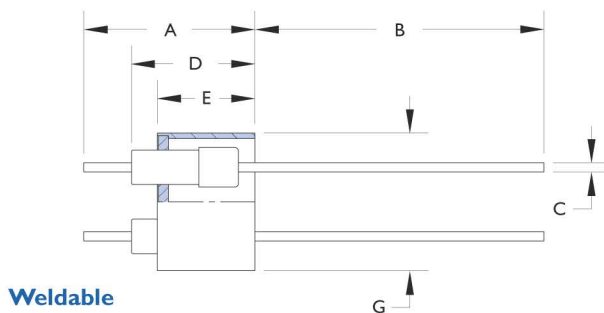
## UHV and HV series



CF Mount



ISO KF Mount



Weldable

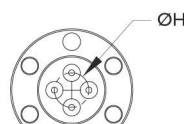


Figure 1

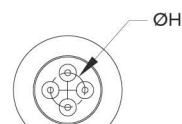


Figure 2

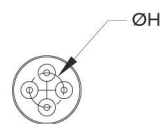
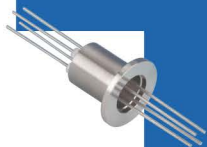


Figure 3

End view Air-side

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

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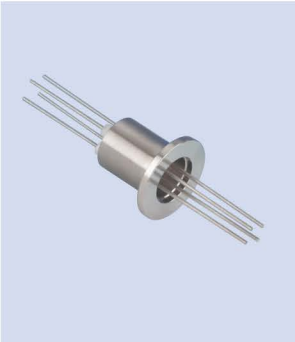
CF



Volts	Amps	Conductor material	End view fig.	A	B	C	D	E	G	H	Reference	Part number
DNI6CF Flange mount												
500	10	Molybdenum	1	25	39	0.8	15	12	12.7	6.4	HV-10M-4-C16	9412004
500	3	Copper	1	25	39	0.8	15	12	12.7	6.4	HV-3C-4-C16	9412005
1000	15	Copper	1	67	35	1.3	30	16	19.1	9.7	HVI-15C-4-C16	9412014
500	2	Nickel	1	25	39	0.8	15	12	12.7	6.4	HV-2N-4-C16	9412006
1000	5	Nickel	1	67	35	1.3	30	16	19.1	9.7	HVI-5N-4-C16	9412015
500	*	Stainless steel	1	25	39	0.8	15	12	12.7	6.4	HV-S-4-C16	9412007
1000	1	Stainless steel	1	67	35	1.3	30	16	19.1	9.7	HVI-1S-4-C16	9412016

\* Instrumentation current only  
Connectors must be ordered separately

ISO KF



Volts	Amps	Conductor material	End view fig.	A	B	C	D	E	G	H	Reference	Part number
DNI6KF Flange mount												
500	10	Molybdenum	2	26	37	0.8	16	14	12.7	6.4	HV-10M-4-K16	9413004
500	3	Copper	2	26	37	0.8	16	14	12.7	6.4	HV-3C-4-K16	9413005
1000	15	Copper	2	67	35	1.3	30	26	19.1	9.7	HVI-15C-4-K16	9413014
500	2	Nickel	2	26	37	0.8	16	14	12.7	6.4	HV-2N-4-K16	9413006
1000	5	Nickel	2	67	35	1.3	30	26	19.1	9.7	HVI-5N-4-K16	9413015
500	*	Stainless steel	2	26	37	0.8	16	14	12.7	6.4	HV-S-4-K16	9413007
1000	1	Stainless steel	2	67	35	1.3	30	26	19.1	9.7	HVI-1S-4-K16	9413016

\* Instrumentation current only  
Connectors must be ordered separately

Weldable



Volts	Amps	Conductor material	End view fig.	A	B	C	D	E	G	H	Reference	Part number
500	10	Molybdenum	3	24	40	0.8	14	11	12.6	6.4	HV-10M-4	9411011
500	3	Copper	3	24	40	0.8	14	11	12.6	6.4	HV-3C-4	9411012
1000	15	Copper	3	54	48	1.3	17	14	18.9	9.7	HVI-15C-4	9411024
500	2	Nickel	3	24	40	0.8	14	11	12.6	6.4	HV-2N-4	9411013
1000	5	Nickel	3	54	48	1.3	17	14	18.9	9.7	HVI-5N-4	9411025
500	*	Stainless steel	3	24	40	0.8	14	11	12.6	6.4	HV-S-4	9411014
1000	1	Stainless steel	3	54	48	1.3	17	14	18.9	9.7	HVI-1S-4	9411026

\* Instrumentation current only  
Connectors must be ordered separately

## Power Low

500 to 1,000V / to 15A / 8 pins



## Features

- 8-pin construction
- Low power
- 3 different conductor materials available
- In-vacuum accessories available
- 3 standard vacuum mounting styles
- Custom feedthrough configurations available upon request

## Specifications

**Voltage<sup>1</sup>** 500 – 1,000V DC maximum

**Current** to 15A

## Material

Flanges 304ss

Shell 304ss

Pins See tables for options

Insulation Alumina ceramic

**Vacuum range** UHV/HV  $1 \times 10^{-10}$  mbar /  $1 \times 10^{-8}$  mbar

Temperature range<sup>2</sup>

CF Flange mounted feedthrough -100°C to 450°C

ISO KF Flange mounted feedthrough -20°C to 150°C

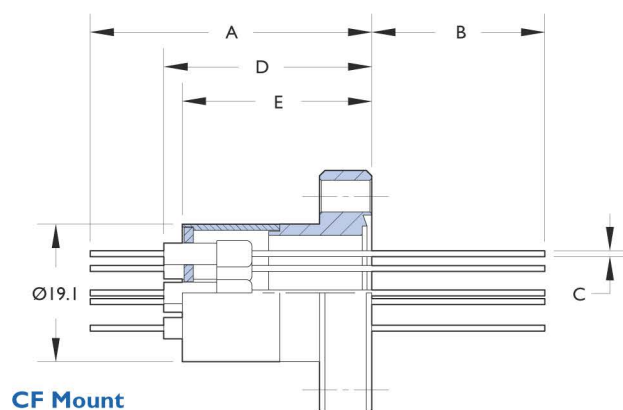
Weldable feedthrough -100°C to 450°C

**Dimensions** Reference only, subject to change

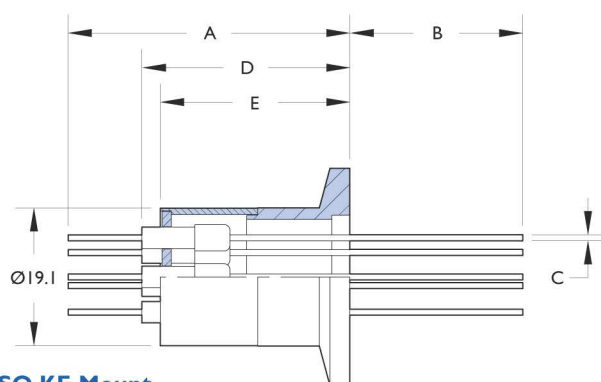
<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

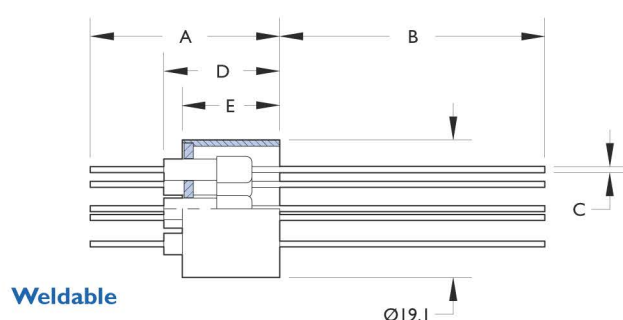
## UHV and HV series



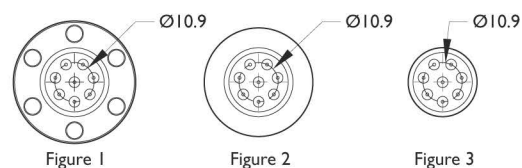
CF Mount



ISO KF Mount



Weldable



End view Air-side

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

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CF



Volts	Amps	Conductor material	End view figure	A	B	C	D	E	Reference	Part number
DNI6CF Flange mount										
500	10	Molybdenum	I	39	25	0.8	29	26	HV-10M-8-C16	9412008
1000	15	Copper	I	44	89	1.3	32	32	HVI-15C-C16	9412021
500	2	Nickel	I	39	25	0.8	29	26	HV-2N-8-C16	9412009
1000	5	Nickel	I	44	89	1.3	32	32	HVI-5N-8-C16	9412022
500	5*	Stainless steel	I	39	25	0.8	29	26	HV-S-8-C16	9412010
1000	5*	Stainless steel	I	44	89	1.3	32	32	HVI-5-S-C16	9412020

\* Instrumentation current only  
Connectors must be ordered separately

ISO KF



Volts	Amps	Conductor material	End view figure	A	B	C	D	E	Reference	Part number
DNI6KF Flange mount										
500	10	Molybdenum	2	39	25	0.8	29	26.2	HV-10M-8-K16	9413008
1000	15	Copper	2	44	89	1.3	32	32	HVI-15C8-K16	9413021
500	2	Nickel	2	39	25	0.8	29	26.2	HV-2N-8-K16	9413009
1000	15	Nickel	2	44	89	1.3	32	32	HVI-5N-8-K16	9413022
500	5*	Stainless steel	1	39	25	0.8	29	26.2	HV-S-8-K16	9413010
1000	5*	Stainless steel	2	44	89	1.3	32	32	HVI-S-8-K16	9413021

\* Instrumentation current only  
Connectors must be ordered separately

Weldable



Volts	Amps	Conductor material	End view figure	A	B	C	D	E	Reference	Part number
500	10	Molybdenum	3	26	37	0.8	16	13.5	HV-10M-8	9411015
1000	15	Copper	3	44	89	1.3	32	32	HVI-15C-8	9411031
500	2	Nickel	3	26	37	0.8	16	13.5	HV-2N-8	9411016
1000	5	Nickel	3	44	89	1.3	32	32	HVI-5N-8	9411032
500	5*	Stainless steel	3	26	37	0.8	16	13.5	HV-S-8	9411017
1000	5*	Stainless steel	3	44	89	1.3	32	32	HVI-S-8	9411030

\* Instrumentation current only  
Connectors must be ordered separately

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

## Section 6.5

## Power Medium

To 2,500V / to 10A / 4 to 10 pins

## Feedthroughs – electrical and optical



## Features

- 4 to 10-pin construction
- Medium power
- In-vacuum accessories available – see section 6.7
- 3 standard vacuum mounting styles
- Custom feedthrough configurations available upon request

## Specifications

<b>Voltage<sup>1</sup></b>	2,500V DC maximum
----------------------------	-------------------

<b>Current</b>	10A
----------------	-----

## Material

Flanges	304ss
Shell	304ss
Pins	Alumel®
Insulation	Alumina ceramic

<b>Vacuum range</b> UHV/HV	$1 \times 10^{-10}$ mbar / $1 \times 10^{-8}$ mbar
----------------------------	--

Temperature range<sup>2</sup>

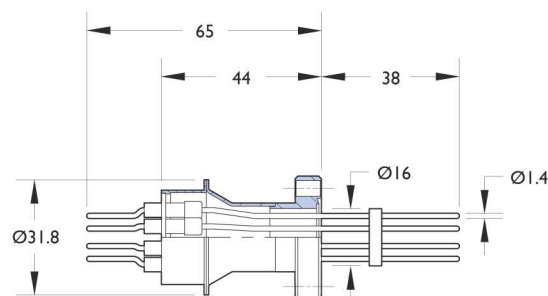
CF Flange mounted feedthrough	-100°C to 450°C
ISO KF Flange mounted feedthrough	-20°C to 150°C
Weldable feedthrough	-100°C to 450°C

<b>Dimensions</b>	Reference only, subject to change
-------------------	-----------------------------------

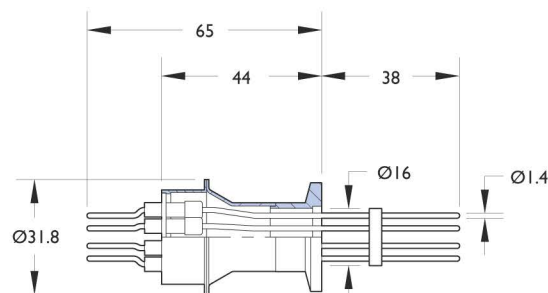
<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

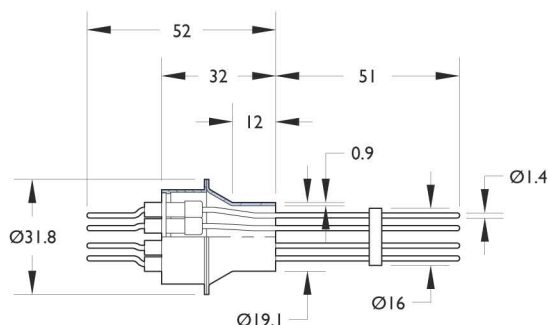
## UHV and HV series



CF Mount



ISO KF Mount



Weldable

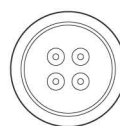


Figure 1

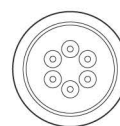


Figure 2

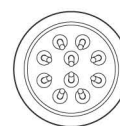


Figure 3

End view Air-side

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

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CF



No. of pins	Flange mount	End view Figure	Reference	Part number
4	DNI6CF	1	HV2-10A-4-C16	9422000
6	DNI6CF	2	HV2-10A-6-C16	9422001
10	DNI6CF	3	HV2-10A-10-C16	9422002

Connectors must be ordered separately

ISO KF



No. of pins	Flange mount	End view Figure	Reference	Part number
4	DNI6KF	1	HV2-10A-4-K16	9423000
6	DNI6KF	2	HV2-10A-6-K16	9423001
10	DNI6KF	3	HV2-10A-10-K16	9423002

Connectors must be ordered separately

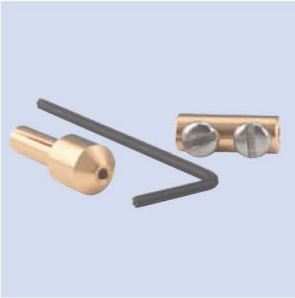
Weldable



No. of pins	End view Figure	Reference	Part number
4	1	HV2-10A-4	9421000
6	2	HV2-10A-6	9421001
10	3	HV2-10A-10	9421002

Connectors must be ordered separately

Accessories



Accessory type	Material	Quantity per pack	Reference	Part number
TC Crimp	Nickel-200	5	TCP-NI	9923018
Ceramic spacer 4/10 pin	Alumina	1	CS4/10-2	9951100
Ceramic spacer, 6 pin	Alumina	1	CS6-2	9951101
Ceramic bead	Alumina	300mm	CBO64	9951001

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

# Power Medium

5,000 volts / 15 amps / 2 and 4 pins



## Features

- 2 and 4-pin construction
- Medium power
- 3 different conductor materials available
- In-vacuum accessories available – see section 6.7
- 3 standard vacuum mounting styles
- Custom feedthrough configurations available upon request

## Specifications

**Voltage<sup>1</sup>** 5,000V DC

**Current** to 15A

### Material

Flanges 304ss

Shell 304ss

Pins See tables for options

Insulation Alumina ceramic

**Vacuum range** UHV/HV  $1 \times 10^{-10}$  mbar /  $1 \times 10^{-8}$  mbar

### Temperature range<sup>2</sup>

CF Flange mounted feedthrough -100°C to 450°C

Weldable feedthrough -100°C to 450°C

ISO KF Flange mounted feedthrough -20°C to 150°C

**Dimensions** Reference only, subject to change

<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

## UHV and HV series

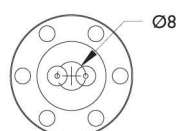
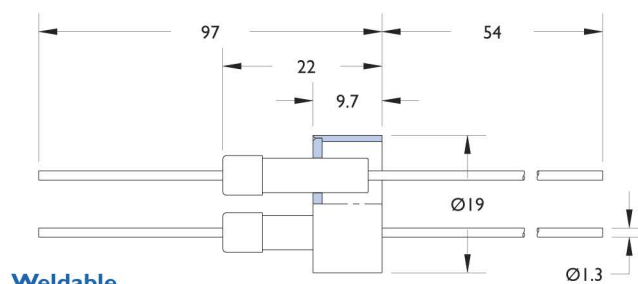
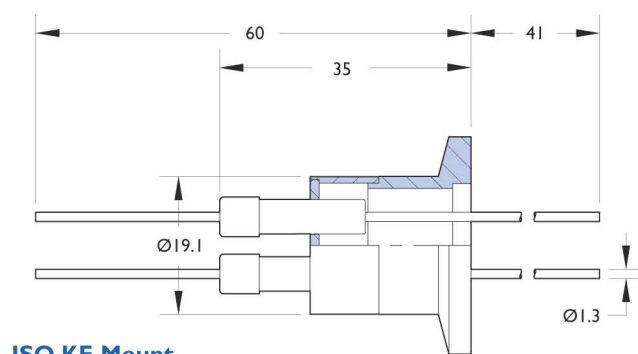
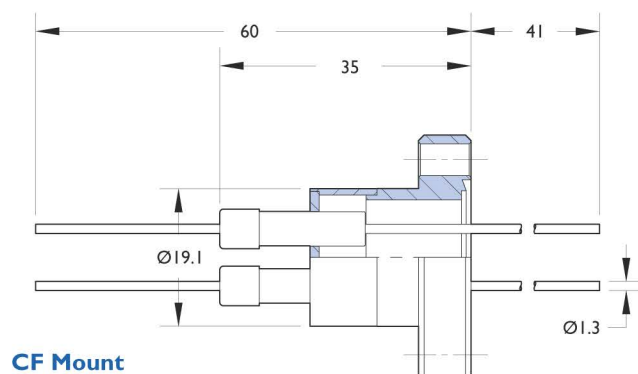


Figure 1

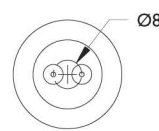


Figure 3

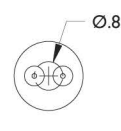


Figure 5

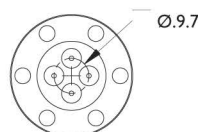


Figure 2

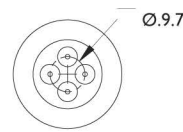


Figure 4

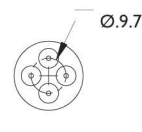


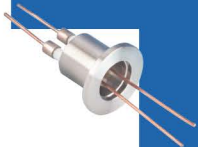
Figure 6

**End view Air-side**

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

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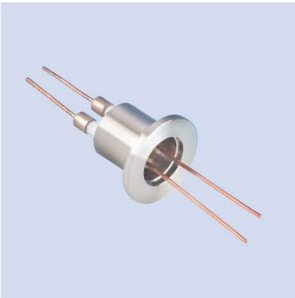
CF



No. of pins	Flange mount	End view figure	Amps	Conductor material	Reference	Part number
2	DN16CF	1	15	Copper	HV5-15C-2-C16	9422010
2	DN16CF	1	5	Nickel	HV5-5N-2-C16	9422011
2	DN16CF	1	1	Stainless steel	HV5-1S-2-C16	9422012
4	DN16CF	2	15	Copper	HV5-15C-4-C16	9422025
4	DN16CF	2	5	Nickel	HV5-5N-4-C16	9422026
4	DN16CF	2	1	Stainless steel	HV5-1S-4-C16	9422027

Connectors must be ordered separately

ISO KF



No. of pins	Flange mount	End view figure	Amps	Conductor material	Reference	Part number
2	DN16KF	3	15	Copper	HV5-15C-2-K16	9423010
2	DN16KF	3	5	Nickel	HV5-5N-2-K16	9423011
2	DN16KF	3	1	Stainless steel	HV5-1S-2-K16	9423012
4	DN16KF	2	15	Copper	HV5-15C-4-K16	9423025
4	DN16KF	2	5	Nickel	HV5-5N-4-K16	9423026
4	DN16KF	2	1	Stainless steel	HV5-1S-4-K16	9423027

Connectors must be ordered separately

Weldable



No. of pins	Amps	Conductor material	End view figure	Reference	Part number
2	15	Copper	5	HV5-15C-2	9421014
2	5	Nickel	5	HV5-5N-2	9421015
2	1	Stainless steel	5	HV5-1S-2	9421016
4	15	Copper	6	HV5-15C-4	9421017
4	5	Nickel	6	HV5-5N-4	9421018
1	1	Stainless steel	6	HV5-1S-4	9421019

Accessories



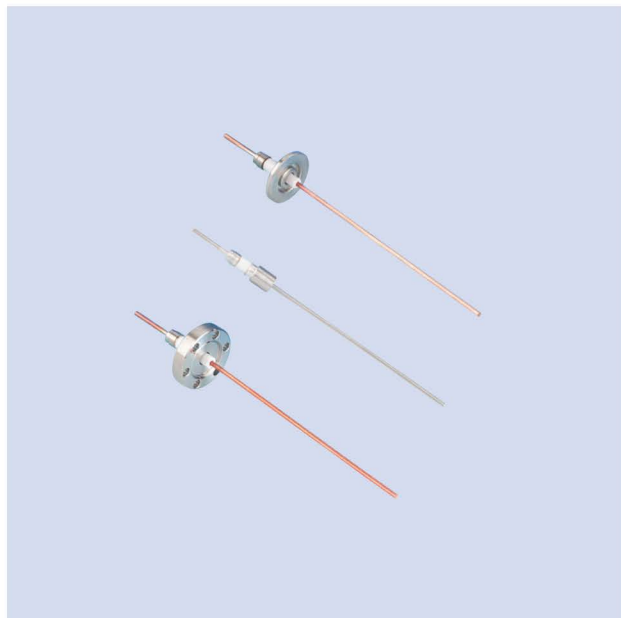
Accessory type	Material	Quantity per pack	Reference	Part number
Power in-line	BeCu	10	PIL-059	9924004
Ceramic bead	Alumina	300mm	CB050	9951002

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

## Section 6.5

## Power Medium

5,000V / to 30A / 1 to 8 pins



## Features

- 1 and 8-pin construction
- Medium power
- 3 different conductor materials available
- In-vacuum accessories available – see section 6.7
- 3 standard vacuum mounting styles
- Custom feedthrough configurations available upon request

## Specifications

<b>Voltage<sup>1</sup></b>	5,000V DC
----------------------------	-----------

<b>Current</b>	to 30A
----------------	--------

## Material

Flanges	304ss
---------	-------

Shell	304ss
-------	-------

Pins	See tables for options
------	------------------------

Insulation	Alumina ceramic
------------	-----------------

<b>Vacuum range</b> UHV/HV	$1 \times 10^{-10}$ mbar / $1 \times 10^{-8}$ mbar
----------------------------	--

Temperature range<sup>2</sup>

CF Flange mounted feedthrough	-100°C to 450°C
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Weldable feedthrough	-100°C to 450°C
----------------------	-----------------

ISO KF Flange mounted feedthrough	-20°C to 150°C
-----------------------------------	----------------

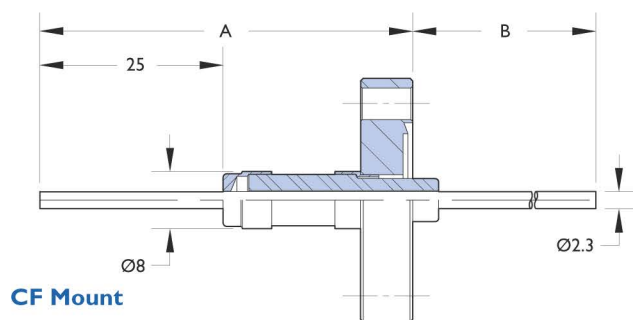
<b>Dimensions</b>	Reference only, subject to change
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<sup>1</sup> See intended operating parameters in introductory section

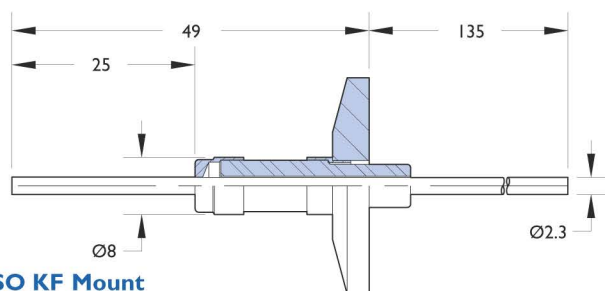
<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

## Feedthroughs – electrical and optical

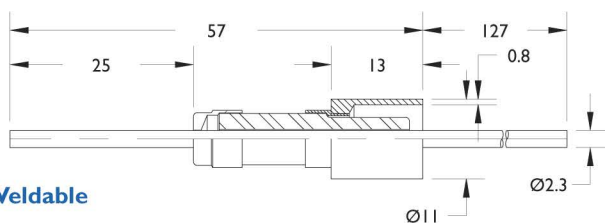
## UHV and HV series



CF Mount



ISO KF Mount



Weldable

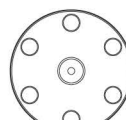


Figure 1



Figure 2

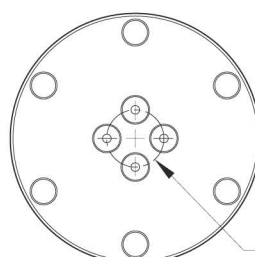


Figure 3

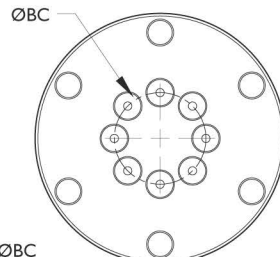


Figure 4



Figure 5

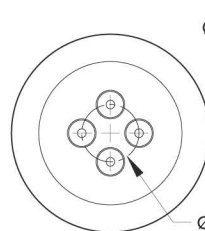


Figure 7

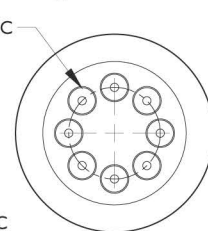


Figure 8

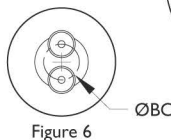
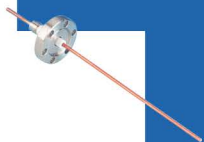


Figure 6

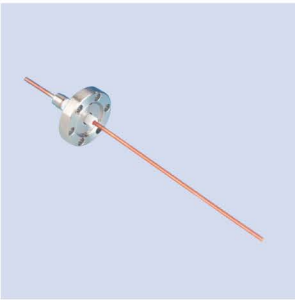
End view Air-side

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

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CF



No. of pins	Flange mount	End view figure	Amps	Conductor material	A	B	BC	Reference	Part number
1	DN16CF	1	30	Copper	52	132	–	HV5-30C-1-C16	9422006
1	DN16CF	1	15	Nickel	52	132	–	HV5-15N-1-C16	9422007
2	DN16CF	2	30	Copper	52	132	9.1	HV5-30C-2-C16	9422013
2	DN16CF	2	15	Nickel	52	132	9.1	HV5-15N-2-C16	9422014
2	DN40CF	2	30	Copper	57	127	12.7	HV5-30C-2-C40	9422017
2	DN40CF	2	15	Nickel	57	127	12.7	HV5-15N-2-C40	9422018
4	DN40CF	3	30	Copper	57	127	15.8	HV5-30C-4-C40	9422028
4	DN40CF	3	15	Nickel	57	127	15.8	HV5-15N-4-C40	9422029
8	DN40CF	4	30	Copper	57	127	25.4	HV5-30C-8-C40	9422032
8	DN40CF	4	15	Nickel	57	127	25.4	HV5-15N-8-C40	9422033

Connectors must be ordered separately

ISO KF



No. of pins	Flange mount	End view figure	Amps	Conductor material	BC	Reference	Part number
1	DN16KF	5	30	Copper	–	HV5-30C-1-K16	9423006
1	DN16KF	5	15	Nickel	–	HV5-15N-1-K16	9423007
2	DN16KF	6	30	Copper	9.1	HV5-30C-2-K16	9423013
2	DN16KF	6	15	Nickel	9.1	HV5-15N-2-K16	9423014
2	DN40KF	6	30	Copper	12.7	HV5-30C-2-K40	9423017
2	DN40KF	6	15	Nickel	12.7	HV5-15N-2-K40	9423018
4	DN40KF	7	30	Copper	15.8	HV5-30C-4-K40	9423028
4	DN40KF	7	15	Nickel	15.8	HV5-15N-4-K40	9423029
8	DN40KF	8	30	Copper	25.4	HV5-30C-8-K40	9423032
8	DN40KF	8	15	Nickel	25.4	HV5-15N-8-K40	9423033

Connectors must be ordered separately

Weldable



No. of pins	Amps	Conductor material	Mount diameter	Reference	Part number
5000	30	Copper	7/8"	HV5-30C	9421010
5000	15	Nickel	7/8"	HV5-15C	9421011

Accessories



Accessory type	Material	Quantity per pack	Reference	Part number
Power push-on	BeCu	10	PPO-094	9924003
Power in-line	BeCu	10	PIL-120	9924006
Ceramic bead	Alumina	300mm	CB102	9951003

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France

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+ 49 (0) 2305 947 508

+ 33 (0) 437 651 750

sales@mdcvacuum.co.uk

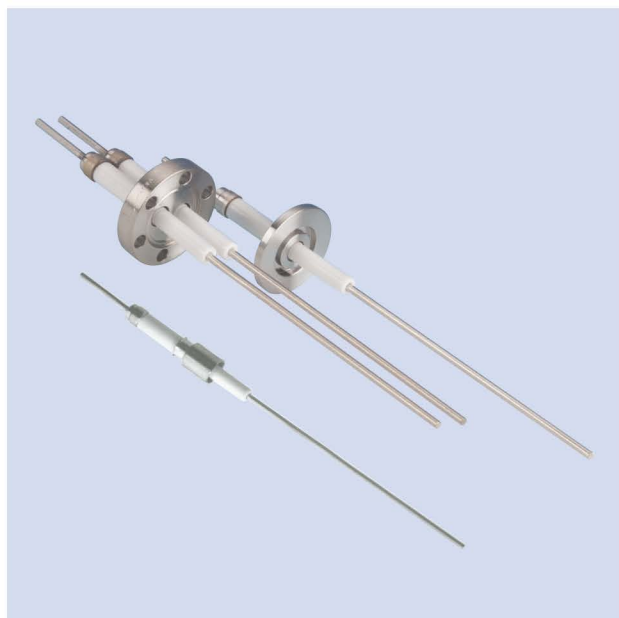
sales@mdcvacuum.de

info@mdcvacuum.fr

## Section 6.5

## Power Medium

10,000V / to 30A / 1 to 4 pins



## Features

- 1 to 4-pin construction
- Medium power
- 3 different conductor materials available
- In-vacuum accessories available – see section 6.7
- 3 standard vacuum mounting styles
- Custom feedthrough configurations available upon request

## Specifications

Voltage<sup>1</sup> 10,000V DC

Current to 30A

## Material

Flanges 304ss

Shell 304ss

Pins See tables for options

Insulation Alumina ceramic

Vacuum range UHV/HV  $1 \times 10^{-10}$  mbar /  $1 \times 10^{-8}$  mbarTemperature range<sup>2</sup>

CF Flange mounted feedthrough -100°C to 450°C

Weldable feedthrough -100°C to 450°C

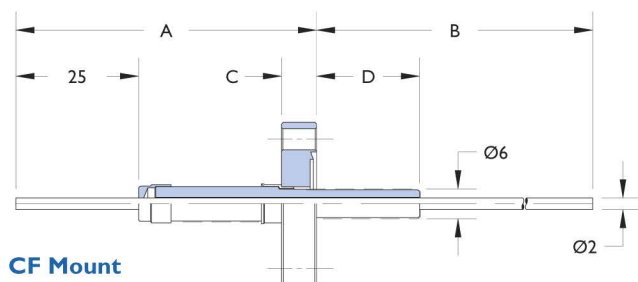
ISO KF Flange mounted feedthrough -20°C to 150°C

Dimensions Reference only, subject to change

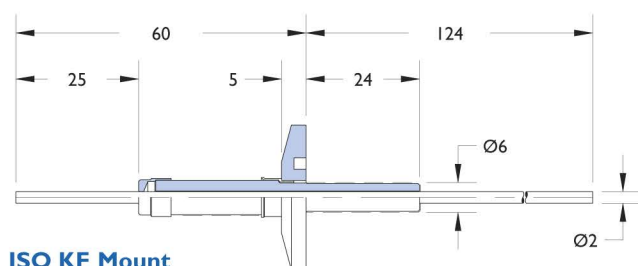
<sup>1</sup> See intended operating parameters in introductory section<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

## Feedthroughs – electrical and optical

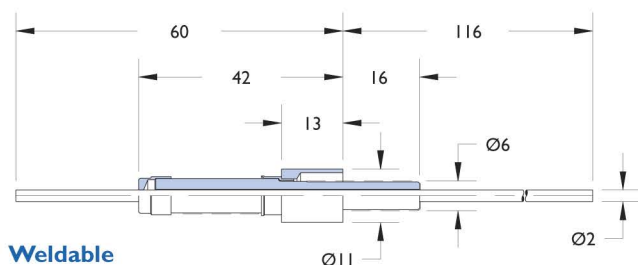
## UHV and HV series



CF Mount



ISO KF Mount



Weldable



Figure 1

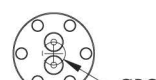


Figure 2

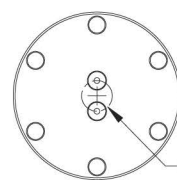


Figure 3

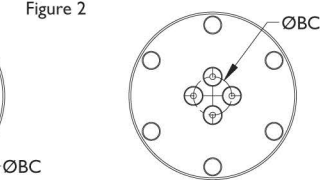


Figure 4



Figure 5

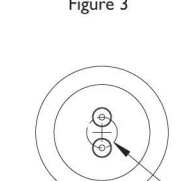


Figure 6

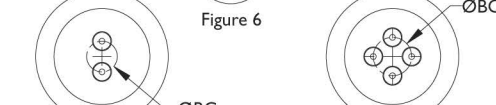


Figure 7

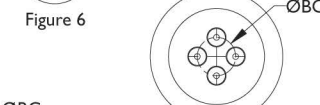


Figure 8

End view Air-side

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

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Power Medium

10,000V / to 30A / 1 to 4 pins



Power Medium

CF



No. of pins	Amps	Conductor material	Flange size	End view fig.	A	B	C	D	BC	Reference	Part number
1	30	Copper	DN16CF	1	62	122	7.4	21	–	HV10-15N-C16	9432000
1	15	Nickel	DN16CF	1	62	122	7.4	21	–	HV10-30C-C16	9432001
2	30	Copper	DN16CF	2	62	122	7.4	21	9.7	HV10-30C-2-C16	9432004
1	15	Nickel	DN16CF	2	62	122	7.4	21	9.7	HV10-15N-2-C16	9432005
2	30	Copper	DN40CF	3	68	117	12.7	12.7	12.7	HV10-30C-2-C40	9432008
2	15	Nickel	DN40CF	3	68	117	12.7	12.7	12.7	HV10-15N-2-C40	9432009
4	30	Copper	DN40CF	3	68	117	12.7	12.7	15.7	HV10-30C-4-C40	9432012
4	15	Nickel	DN40CF	3	68	117	12.7	12.7	15.7	HV10-15N-C40	9432013

ISO KF



No. of pins	Amps	Conductor material	Flange size	End view figure	BC	Reference	Part number
1	30	Copper	DN16KF	5	–	HV10-30C-K16	9433000
1	15	Nickel	DN16KF	5	–	HV10-15N-K16	9433001
1	30	Copper	DN16KF	6	9.9	HV10-30C-2-K16	9433004
1	15	Nickel	DN16KF	6	9.9	HV10-15N-2-K16	9433005
1	30	Copper	DN40KF	7	12.7	HV10-30C-2-K40	9433008
1	15	Nickel	DN40KF	7	12.7	HV10-15N-2-K40	9433009
1	30	Copper	DN40KF	8	15.7	HV10-30C-4-K40	9433012
1	15	Nickel	DN40KF	8	15.7	HV10-15N-K40	9433013

Weldable



Volts	Amps	Conductor material	Mount diameter	Reference	Part number
10000	30	Copper	7/8"	CHV12-30C	9431001
10000	15	Nickel	7/8"	HV5-15N	9431002

Accessories



Accessory type	Material	Quantity per pack	Reference	Part number
Power push-on	BeCu	10	PPO-094	9924003
Power in-line	BeCu	10	PIL-120	9924006
Ceramic bead	Alumina	300mm	CB102	9951003

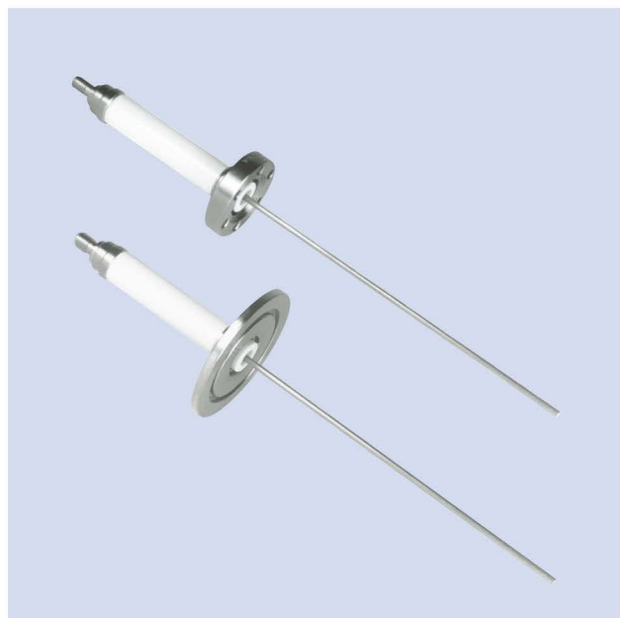
All dimensions are nominal in millimetres unless specified - Weights given are approximate

## Section 6.5

## Power High

20,000V / 150A / 1 pin

## Feedthroughs – electrical and optical



## Features

- Single-pin construction
- High power
- In-vacuum accessories available – see section 6.7
- 3 standard vacuum mounting styles
- Custom feedthrough configurations available upon request

## Specifications

<b>Voltage<sup>1</sup></b>	20,000V DC
<b>Current</b>	15A
<b>Material</b>	
Flanges	304ss
Adaptor	304ss
Conductor	Nickel
Insulation	Alumina ceramic

**Vacuum range** UHV/HV  $1 \times 10^{-10}$  mbar /  $1 \times 10^{-8}$  mbar

Temperature range<sup>2</sup>

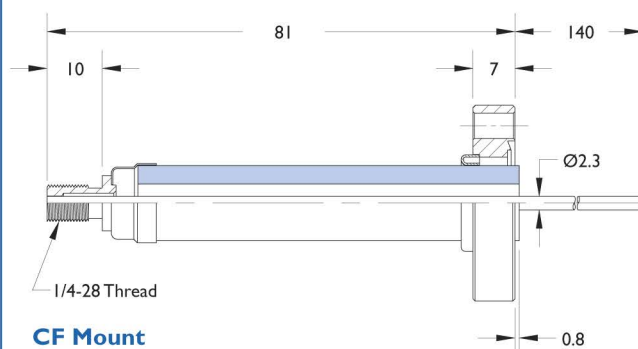
CF Flange mounted feedthrough	-100°C to 450°C
ISO KF Flange mounted feedthrough	-100°C to 150°C
Weldable feedthrough	-100°C to 450°C

**Dimensions** Reference only, subject to change

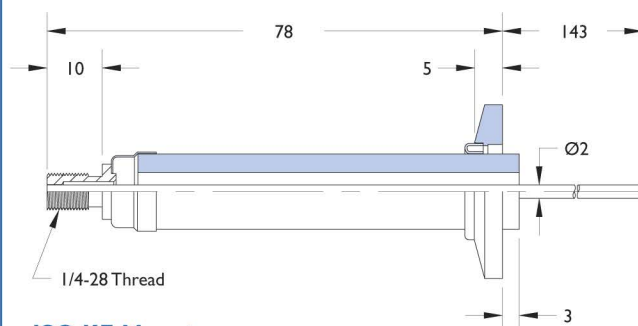
<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

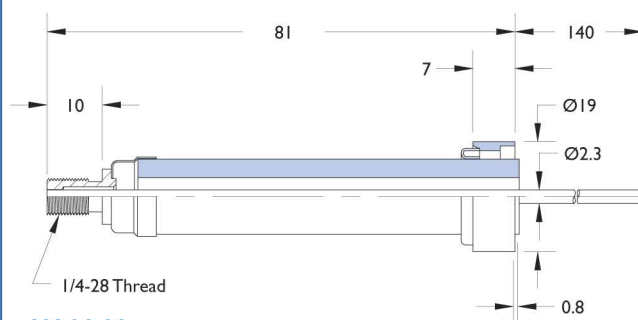
## UHV and HV series



CF Mount



ISO KF Mount



Weldable

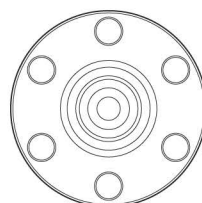


Figure 1

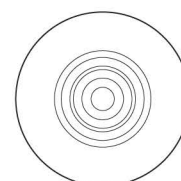


Figure 2



Figure 3

End view Air-side

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

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CF



Conductor material	Flange mount	End view figure	Reference	Part number
Nickel	DNI6CF	2	HV2-15N-CI6	9442000

ISO KF



Conductor material	Flange mount	End view figure	Reference	Part number
Nickel	DNI6KF	2	HV2-15N-KI6	9443000

Weldable



Conductor material	End view figure	Reference	Part number
Nickel	3	HV2Q-15N	9441000

Accessories



Accessory type	Material	Quantity per pack	Reference	Part number
Power push-on	BeCu	10	PPO-94	9924003
Power in-line	BeCu	10	PIL-12	9924006
Ceramic bead	Alumina	300mm	CB104	9951003

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

# Power High

20,000V / to 150A / 1 pin



## Features

- Single-pin construction
- High power
- Solid pin configuration
- 2 different conductor materials available
- In-vacuum accessories available – see section 6.7
- 3 standard vacuum mounting styles
- Custom feedthrough configurations available upon request

## Specifications

**Voltage<sup>1</sup>** 20,000V DC

**Current** 75 to 150A

### Material

Flanges 304ss

Shell 304ss

Pins See tables for options

Insulation Alumina ceramic

**Vacuum range** UHV/HV  $1 \times 10^{-10}$  mbar /  $1 \times 10^{-8}$  mbar

### Temperature range<sup>2</sup>

CF Flange mounted feedthrough -100°C to 450°C

ISO KF Flange mounted feedthrough -20°C to 150°C

Weldable feedthrough -100°C to 450°C

**Dimensions** Reference only, subject to change

<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

## UHV and HV series

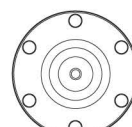
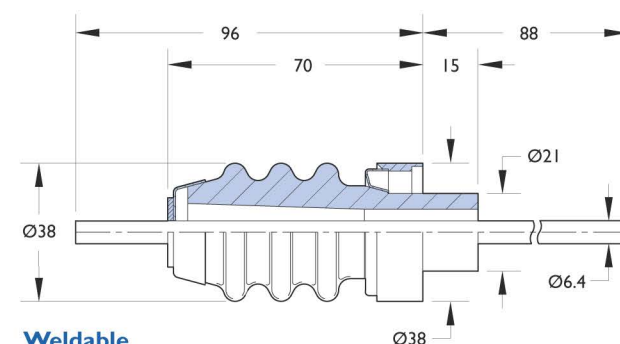
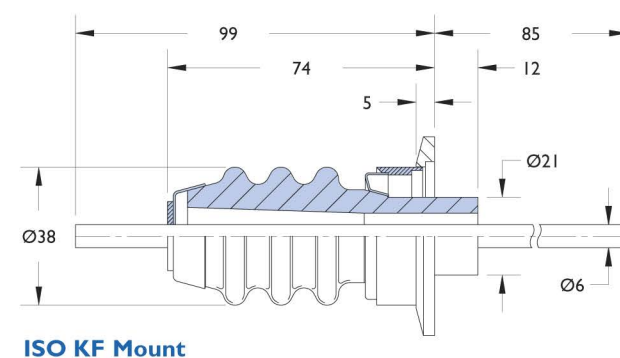
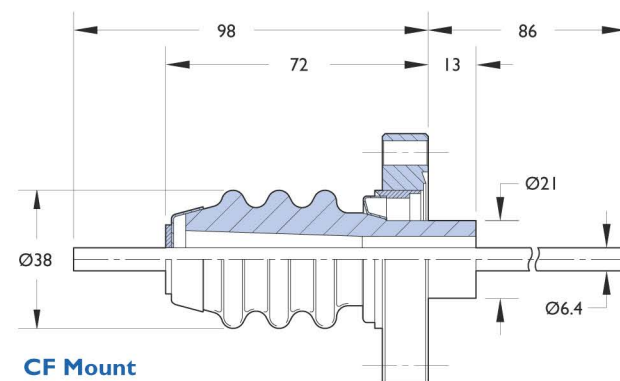


Figure 1



Figure 2



Figure 3

## End view Air-side

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

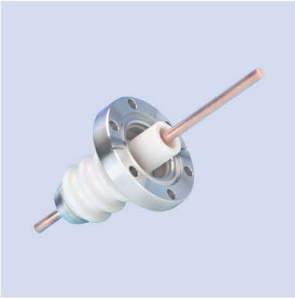
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CF



Conductor material	Amps	Flange mount	End view figure	Reference	Part number
Copper	150	DN40CF	I	FHV20-150C-C40	9442004
Nickel	75	DN40CF	I	FHV20-75N-C40	9442005

Connectors must be ordered separately

ISO KF



Conductor material	Amps	Flange mount	End view figure	Reference	Part number
Copper	150	DN40KF	I	FHV20-150C-K40	9443010
Nickel	75	DN40KF	I	FHV20-75N-K40	9443011

Connectors must be ordered separately

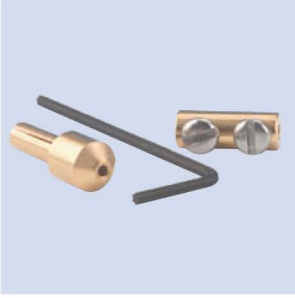
Weldable



Conductor material	Amps	End view figure	Reference	Part number
Copper	150	3	FHV20-150C	9441004
Nickel	75	3	FHV20-75N	9441005

Connectors must be ordered separately

Accessories



Accessory type	Material	Quantity per pack	Reference	Part number
Power push-on	BeCu	10	PPO-94	9924003
Power in-line	BeCu	10	PIL-120	9924006
Ceramic bead	Alumina	300mm	CB104	9951003

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

## Section 6.5

## Power High

20,000 to 30,000V / 1A / 1 pin



## Features

- Single-pin construction
- High power
- In-vacuum accessories available – see section 6.7
- 3 standard vacuum mounting styles
- Custom feedthrough configurations available upon request

## Specifications

<b>Voltage<sup>1</sup></b>	to 30,000V DC
----------------------------	---------------

<b>Current</b>	1A
----------------	----

## Material

Flanges	304ss
Shell	304ss
Pins	Stainless steel
Insulation	Alumina ceramic

<b>Vacuum range</b> UHV/HV	$1 \times 10^{-10}$ mbar / $1 \times 10^{-8}$ mbar
----------------------------	--

Temperature range<sup>2</sup>

CF Flange mounted feedthrough	-100°C to 450°C
ISO KF Flange mounted feedthrough	-20°C to 150°C
Weldable feedthrough	-100°C to 450°C

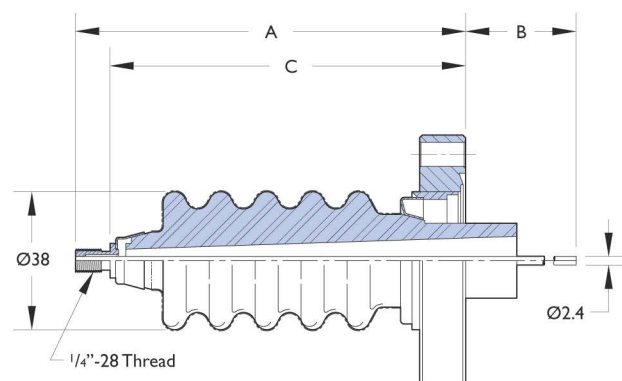
<b>Dimensions</b>	Reference only, subject to change
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<sup>1</sup> See intended operating parameters in introductory section

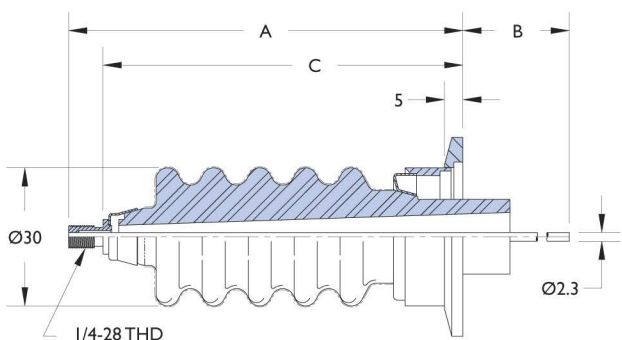
<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

## Feedthroughs – electrical and optical

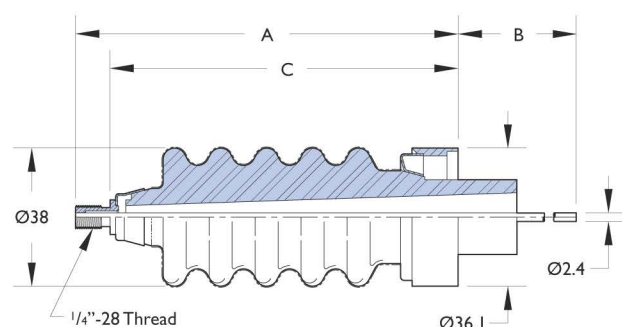
## UHV and HV series



CF Mount



ISO KF Mount



Weldable

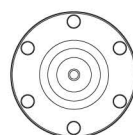


Figure 1



Figure 2



Figure 3

End view Air-side

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

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CF



Volts	Flange mount	End view figure	A	B	C	Reference	Part number
20KV	DN40CF	1	96	135	86	FHV20-IS-C40	9442003
25KV	DN40CF	1	108	122	99	FHV25-IS-C40	9442002
30KV	DN40CF	1	105	121	95	FHV30-IS-C40	9442001

Connectors must be ordered separately

ISO KF



Volts	Flange mount	End view figure	A	B	C	Reference	Part number
20KV	DN40KF	2	84	141	75	FHV20-IS-K40	9443003
25KV	DN40KF	2	97	128	87	FHV25-IS-K40	9443002
30KV	DN40KF	2	110	116	100	FHV30-IS-K40	9443001

Connectors must be ordered separately

Weldable



Volts	Flange mount	End view figure	A	B	C	Reference	Part number
20KV	DN40CF	1	96	135	86	FHV20-IS	9441003
25KV	DN40CF	1	108	122	99	FHV25-IS	9441002
30KV	DN40CF	1	105	121	95	FHV30-IS	9441001

Connectors must be ordered separately

## Section 6.5

# Power High

30,000 to 40,000V / 3A / 1 pin



## Features

- Single-pin construction
- High voltage
- In-vacuum accessories available
- 3 standard vacuum mounting styles
- Custom feedthrough configurations available upon request

## Specifications

**Voltage<sup>1</sup>** 30,000 – 40,000V DC

**Current** to 3A

### Material

Flanges 304ss

Shell 304ss

Pins Stainless steel

Insulation Alumina ceramic

**Vacuum range** UHV/HV  $1 \times 10^{-10}$  mbar /  $1 \times 10^{-8}$  mbar

### Temperature range<sup>2</sup>

CF Flange mounted feedthrough -100°C to 450°C

ISO KF Flange mounted feedthrough -20°C to 150°C

Weldable feedthrough -100°C to 450°C

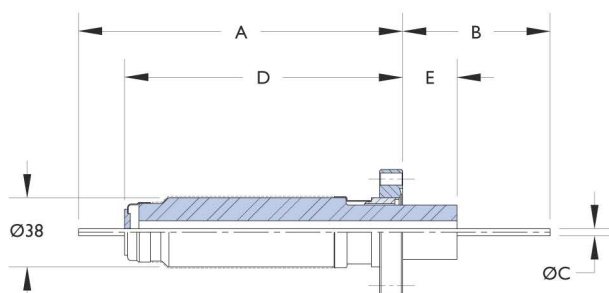
**Dimensions** Reference only, subject to change

<sup>1</sup> See intended operating parameters in introductory section

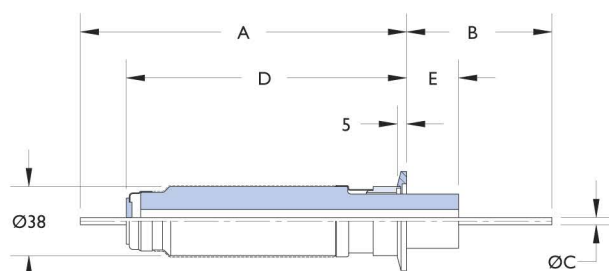
<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

## Feedthroughs – electrical and optical

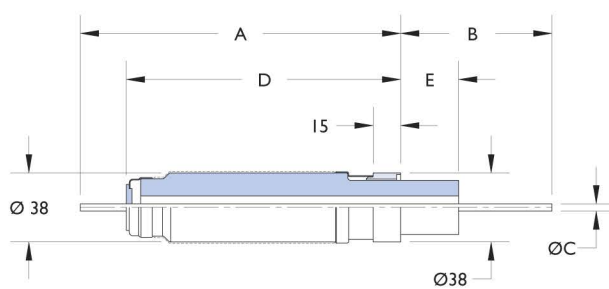
## UHV Series



CF Mount



ISO KF Mount



Weldable



Figure 1



Figure 2



Figure 3

End view Air-side

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

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CF



Flange mounts	Volts	Amps	A	B	C	D	E	Reference	Part number
DN40CF	30kV	1	179	81	2.4	154	30	HV30-IS-C40	9442008
DN40CF	30kV	3	179	81	3.9	154	30	HV30-3S-C40	9442009
DN40CF	40kV	1	217	100	2.4	192	49	HV40-IS-C40	9442010
DN40CF	40kV	3	217	100	3.9	192	49	HV40-3S-C40	9442011

Connectors must be ordered separately

ISO KF



Volts	Amps	Mount dia.	End view fig.	A	B	C	D	E	Reference	Part number
30kV	1	DN40KF	2	180	76	2.4	155	29	HV30-IS-K40	9443006
30kV	3	DN40KF	2	180	76	4	155	29	HV30-3S-K40	9443007
40kV	1	DN40KF	2	218	102	2.4	193	48	HV40-IS-K40	9443008
40kV	3	DN40KF	2	218	102	4	193	48	HV40-3S-K40	9443009

Connectors must be ordered separately

Weldable



Volts	Amps	End view figure	A	B	C	D	E	Reference	Part number
30kV	1	3	177	84	8.4	151	32	HV30-IS	9441008
30kV	3	3	177	84	4	151	32	HV30-3S	9441009
40kV	1	3	215	103	8.4	184	51	HV40-IS	9441010
40kV	3	3	215	103	8.4	184	51	HV40-3S	9441011

Connectors must be ordered separately

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



## Section 6.5

# Power High

45,000 to 100,000V / 3A / 1 pin



## Features

- Single-pin construction
- High power
- In-vacuum accessories available – see section 6.7
- 3 standard vacuum mounting styles
- Custom feedthrough configurations available upon request

## Specifications

**Voltage<sup>1</sup>** 45,000 – 100,000V DC

**Current** 3A

### Material

Flanges 304ss

Shell 304ss

Pins Stainless steel

Insulation Alumina ceramic

**Vacuum range UHV**  $1 \times 10^{-10}$  mbar

### Temperature range<sup>2</sup>

CF Flange mounted feedthrough -100°C to 450°C

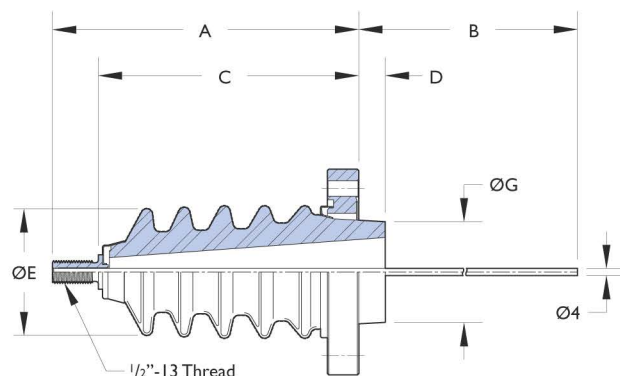
Weldable feedthrough -100°C to 450°C

**Dimensions** Reference only, subject to change

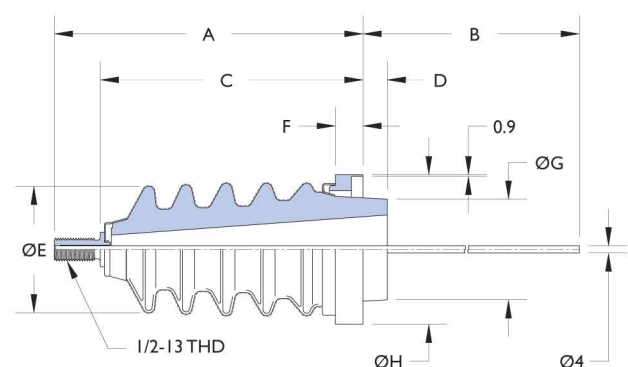
<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

## UHV Series



### CF Mount



### Weldable

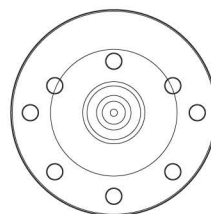


Figure 1

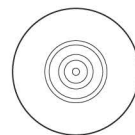


Figure 2

### End view Air-side

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

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CF



Volts	Flange mount	A	B	C	D	E	G	Reference	Part number
45kV	DN63CF	169	136	144	15	70	56	FHV45-3S-C63	9442012
60kV	DN63CF	201	123	176	23	73	56	FHV60-3S-C63	9442013
100 kV	DNI100CF	280	139	255	37	89	66	FHV100-3S-C100	9442014

Connectors must be ordered separately

Weldable



Volts	End view fig.	A	B	C	D	E	F	G	H	Reference	Part number
45kV	2	170	115	145	13	70	15	56	83	FHV45-3S	9441012
60kV	2	142	123	228	21	73	15	56	83	FHV60-3S	9441013
100 kV	2	278	142	252	41	89	14	66	95	FHV100-3S	9441014

Connectors must be ordered separately

Accessories



Accessory type	Material	See page	Quantity per pack	Reference	Part number
Power in-line	BeCu	189	10	PIL-260	9924008

Connectors must be ordered separately

## Section 6.5

## Power High

40,000V / to 7A / 1 pin

## Feedthroughs – electrical and optical



## Description

Ultra-compact size and safe atmospheric side connectivity make the new, high-voltage, 40kV feedthrough the bench mark for the future of high power feedthroughs.

## Features

- Atmospheric side connector and 9.5m long cable included
- Single-pin configuration
- High voltage for lower-power applications
- Custom feedthrough configurations available upon request

## Specifications

**Voltage<sup>1</sup>** 40,000V DC

**Current** to 7A

## Material

Flanges 304ss

Adaptor 304ss

Conductor Alumel®

Insulation Alumina ceramic

**Vacuum range** UHV/HV  $1 \times 10^{-10}$  mbar /  $1 \times 10^{-8}$  mbar

Temperature range<sup>2</sup>

CF Flange mounted feedthrough -100°C to 450°C

ISO KF Flange mounted feedthrough -20°C to 150°C

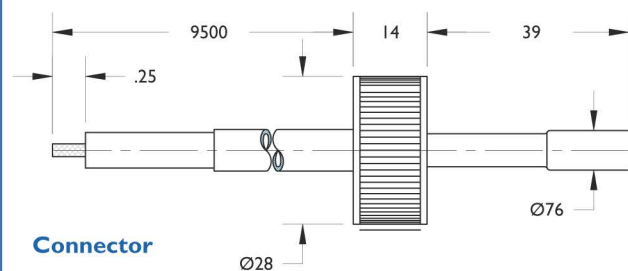
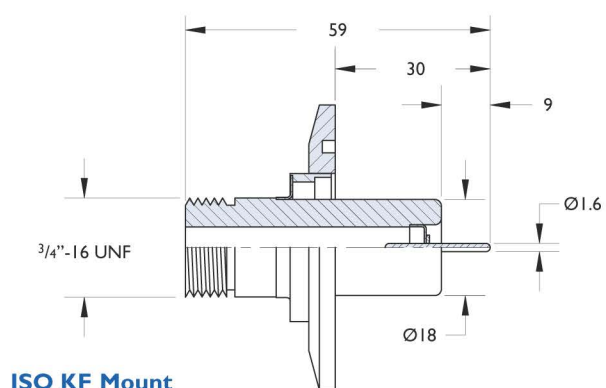
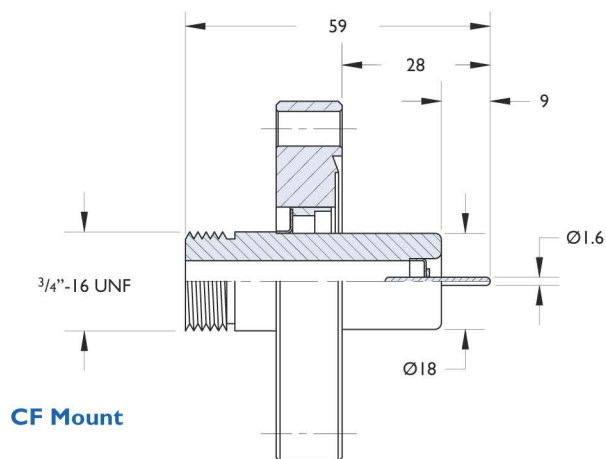
Connector -55°C to 125°C

**Dimensions** Reference only, subject to change

<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

## UHV and HV series



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

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Ultra compact 40kV



Description	Length	Reference	Part number
DN40CF		UCHP-40	9442015
DN40KF		UCHP-K40	9443012
DN50KF		UCHP-K50	9443013
Connector	9.5m	UCHP-CON	9924076

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

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# Power High

3,000 to 12,000V / to 600A / 1 pin



## Features

- Single-pin construction
- High voltage
- High power
- 3 different conductor materials available
- In-vacuum accessories available – see section 6.7
- Custom feedthrough configurations available upon request

## Specifications

**Voltage<sup>1</sup>** 3,000 – 12,000V DC

**Current** to 600A

### Material

Shells 304ss

Adaptor 304ss

Conductor See tables for options

Insulation Alumina ceramic

**Vacuum range** UHV/HV  $1 \times 10^{-10}$  mbar /  $1 \times 10^{-8}$  mbar

### Temperature range<sup>2</sup>

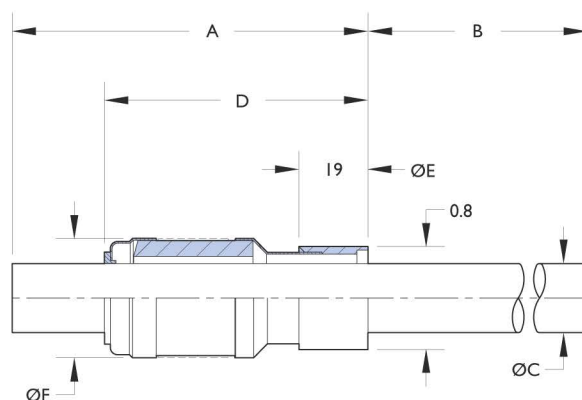
Weldable feedthrough -100°C to 450°C

**Dimensions** Reference only, subject to change

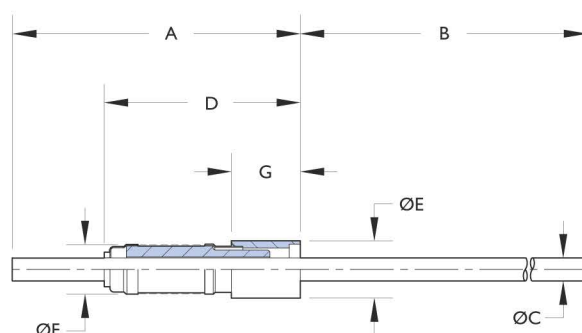
<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

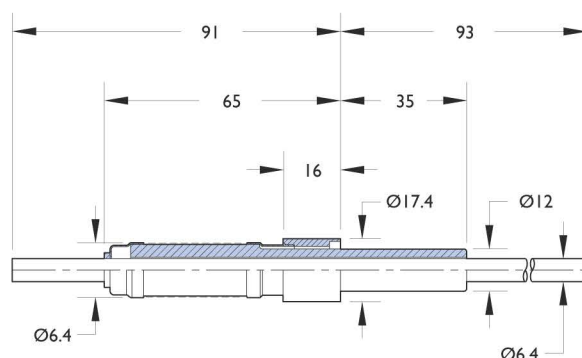
## UHV and HV series



3,000V weldable



5,000V weldable



12,000V weldable

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Weldable 3kV



Amps	Conductor material	A	B	C	D	E	F	Reference	Part number
600	Copper	98	86	19	72	28.4	33	MC3-600C	9451000
250	Copper	81	103	10	56	18.9	20	MC3-250C	9451001

Connectors must be ordered separately

Weldable 5kV



Amps	Conductor material	A	B	C	D	E	F	G	Reference	Part number
150	Copper	79	105	6.4	54	15.8	14	19	MC5-150C	9451002
75	Nickel	79	105	6.4	54	15.8	14	19	MC5-75N	9451003
7	Stainless steel	79	105	6.4	54	15.8	14	19	MC5-7S	9451004
60	Copper	84	125	3.9	33	12.6	10	13	MC5-60C	9451008
40	Nickel	84	125	3.9	33	12.6	10	13	MC5-40N	9451009

Connectors must be ordered separately

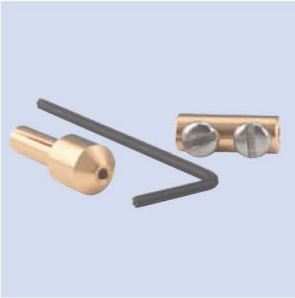
Weldable 12kV



Amps	Material	Reference	Part number
150	Copper	MC12-150C	9451016
75	Nickel	MC12-75N	9451017
7	Stainless steel	MC12-7S	9451018

Connectors must be ordered separately

Accessories



Accessory type	Material	Quantity per pack	Reference	Part number
Power in-line	BeCu	10	PIL-260	9924008
In-line clamp	Copper	1	IPLC	991536
Right-angle clamp	Copper	1	RAPC	991537

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

# Power High

3,000 to 12,000V / to 600A / 1 to 4 pins



## Features

- Single pin configuration
- High voltage
- High power
- 3 different conductor materials available
- In-vacuum accessories available – see section 6.7
- Custom feedthrough configurations available upon request

## Specifications

**Voltage<sup>1</sup>** 3,000 – 12,000V DC

**Current** 7 to 600A

### Material

Flanges 304ss

Adaptor 304ss

Conductor See tables for options

Insulation Alumina ceramic

**Vacuum range UHV**  $1 \times 10^{-10}$  mbar

### Temperature range<sup>2</sup>

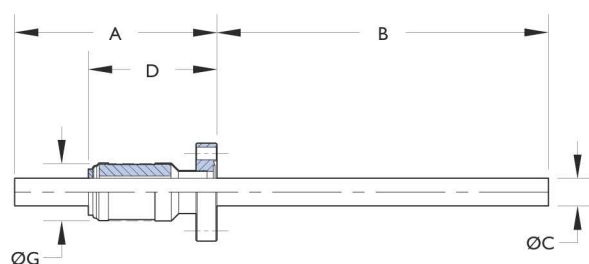
CF Flange mounted feedthrough -100°C to 450°C

**Dimensions** Reference only, subject to change

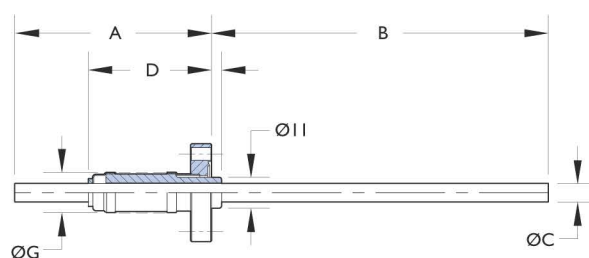
<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

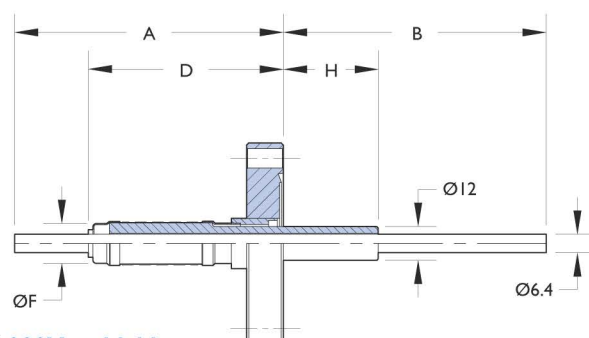
## UHV Series



3,000V weldable



5,000V weldable



12,000V weldable



Figure 1

Ø19 BC (5kv)  
Ø19 BC (12kv)



Figure 2



Figure 3



Ø24 BC  
Figure 4

End view Air-side

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CF 3kV



No. of pins	Amps	Conductor material	Flange mount	End view fig.	A	B	C	D	G	Reference	Part number
1	600	Copper	DN40CF	1	99	85	19.1	74	33	MC3-600C-C40	9452000
1	250	Copper	DN16CF	1	68	117	9.7	42	20	MC3-250C-C16	9452001

Connectors must be ordered separately

CF 5kV



No. of pins	Amps	Conductor material	Flange mount	End view fig.	A	B	C	D	G	H	Reference	Part number
1	150	Copper	DN16CF	1	68	116	6.4	14	11	4	MC5-150C-C16	9452002
1	75	Nickel	DN16CF	1	68	116	6.4	14	11	4	MC5-75N-C16	9452003
1	7	Stainless steel	DN16CF	1	68	116	6.4	14	11	4	MC5-7S-C16	9452004
1	150	Copper	DN40CF	1	81	103	6.4	14	11	–	MC5-150C-C40	9452005
1	75	Nickel	DN40CF	1	81	103	6.4	14	11	–	MC5-75N-C40	9452006
1	7	Stainless steel	DN40CF	1	81	103	6.4	14	11	–	MC5-7S-C40	9452007
2	150	Copper	DN40CF	2	81	103	6.4	33	11	–	MC5-150C-2-C40	9452008
2	75	Nickel	DN40CF	2	81	103	6.4	33	11	–	MC5-75N-2-C40	9452009
2	7	Stainless steel	DN40CF	2	81	103	6.4	38	11	–	MC5-7S-2-C40	9452010
3	150	Copper	DN40CF	3	81	103	6.4	38	11	–	MC5-150C-3-C40	9452011
3	75	Nickel	DN40CF	3	81	103	6.4	38	11	–	MC5-75N-3-C40	9452012
3	7	Stainless steel	DN40CF	3	81	103	6.4	38	11	–	MC5-7S-3-C40	9452013
4	150	Copper	DN40CF	4	81	103	6.4	38	11	–	MC5-150C-4-C40	9452014
4	75	Nickel	DN40CF	4	81	103	6.4	38	11	–	MC5-75N-4-C40	9452015
4	7	Stainless steel	DN40CF	4	81	103	6.4	38	11	–	MC5-7S-4-C40	9452016

Connectors must be ordered separately

CF 12kV



No. of pins	Amps	Conductor material	Flange mount	End view fig.	A	B	D	F	H	Reference	Part number
1	150	Copper	DN16CF	1	83	102	57	15	43	MC12-150C-C16	9452017
1	75	Nickel	DN16CF	1	83	102	57	15	43	MC12-75N-C16	9452018
1	7	Stainless steel	DN16CF	1	83	102	57	15	43	MC12-7S-C16	9452019
1	150	Copper	DN40CF	1	92	82	66	15	34	MC12-150C-C40	9452020
1	75	Nickel	DN40CF	1	92	82	66	15	34	MC12-75N-C40	9452021
1	7	Stainless steel	DN40CF	1	92	82	66	15	34	MC12-7S-C40	9452022
2	150	Copper	DN40CF	2	92	82	66	35	34	MC12-150C-2-C40	9452023
2	75	Nickel	DN40CF	2	92	82	66	35	34	MC12-75N-2-C40	9452024
2	7	Stainless steel	DN40CF	2	92	82	66	35	34	MC12-7S-2-C40	9452025

Connectors must be ordered separately

Accessories



Accessory type	Material	Quantity per pack	Reference	Part number
Power in-line	BeCu	10	PIL-260	9924008
In-line clamp	Copper	1	IPLC	991536
Right-angle clamp	Copper	1	RAPC	991537

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# Power High

3,000 to 5,000V / to 600A / 1 to 4 pins



## Features

- 1 to 4 pin configuration
- High voltage
- High power
- Standard vacuum mounting style
- 3 different conductor materials available
- In-vacuum accessories available – see section 6.7
- Custom feedthrough configurations available upon request

## Specifications

**Voltage<sup>1</sup>** 3,000 – 5,000V DC

**Current** to 600A

### Material

Flanges 304ss

Adaptor 304ss

Conductor See tables for options

Insulation Alumina ceramic

**Vacuum range HV**  $1 \times 10^{-4}$  mbar

### Temperature range<sup>2</sup>

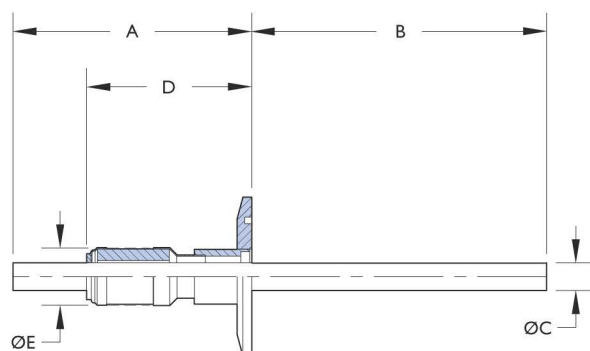
ISO KF Flange -20°C to 150°C

**Dimensions** Reference only, subject to change

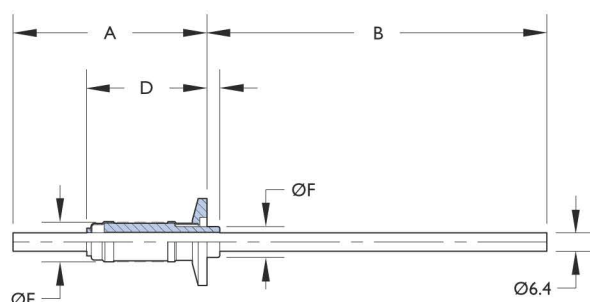
<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

## HV Series



3,000V ISO KF mount



5,000V ISO KF mount



Figure 1

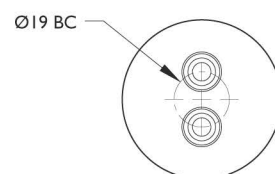


Figure 2

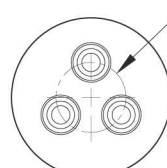


Figure 3

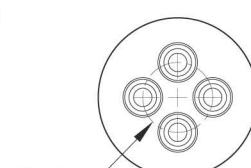


Figure 4

End view Air-side

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ISO KF 3kV



No. of pins	Amps	Conductor material	Flange mount	End view fig.	A	B	C	D	E	Reference	Part number
1	600	Copper	DN40KF	1	98	86	19.1	72	33	MC3-600C-K40	9453000
1	250	Copper	DN40KF	1	80	104	9.7	55	20	MC3-250C-K40	9453001

Connectors must be ordered separately

ISO KF 5kV



No. of pins	Amps	Conductor material	Flange mount	End view fig.	A	B	C	D	E	F	Reference	Part number
1	150	Copper	DN16KF	1	66	118	41	14	11	6	MC5-150C-K16	9453002
1	75	Nickel	DN16KF	1	66	118	41	14	11	6	MC5-75N-K16	9453003
1	7	Stainless steel	DN16KF	1	66	118	41	14	11	6	MC5-7S-K16	9453004
1	150	Copper	DN40KF	1	80	105	54	14	–	–	MC5-150C-K40	9453005
1	75	Nickel	DN40KF	1	80	105	54	14	–	–	MC5-75N-K40	9453006
1	7	Stainless steel	DN40KF	1	80	105	54	14	–	–	MC5-7S-K40	9453007
2	150	Copper	DN40KF	2	80	105	54	33	–	–	MC5-150C-2-K40	9453008
2	75	Nickel	DN40KF	2	80	105	54	33	–	–	MC5-75N-2-K40	9453009
2	7	Stainless steel	DN40KF	2	80	105	54	33	–	–	MC5-7S-2-K40	9453010
3	150	Copper	DN40KF	3	82	102	57	38	–	–	MC5-150C-3-K40	9453011
3	75	Nickel	DN40KF	3	82	102	57	38	–	–	MC5-75N-3-K40	9453012
3	7	Stainless steel	DN40KF	3	82	102	57	38	–	–	MC5-7S-3-K40	9453013
4	150	Copper	DN50KF	4	80	105	54	38	–	–	MC5-150C-4-K50	9453014
4	75	Nickel	DN50KF	4	80	105	54	38	–	–	MC5-75N-4-K50	9453015
4	7	Stainless steel	DN50KF	4	80	105	54	38	–	–	MC5-7S-4-K50	9453016

Connectors must be ordered separately

Accessories



Accessory type	Material	Quantity per pack	Reference	Part number
Power in-line	BeCu	10	PIL-260	9924008
In-line clamp	Copper	1	IPLC	991536
Right-angle clamp	Copper	1	RAPC	991537

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



## Section 6.5

## Power High

3,000 to 15,000V / to 250A / 1 pin



## Features

- Single-pin configuration
- High voltage
- High power
- 3 different conductor materials available
- In-vacuum accessories available – see section 6.7
- Baseplate mounting style
- Custom feedthrough configurations available upon request

## Specifications

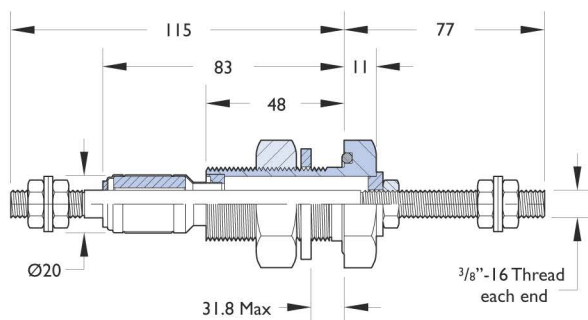
<b>Voltage<sup>1</sup></b>	3,000 – 15,000V DC
<b>Current</b>	5 to 250A
<b>Material</b>	
Baseplate	304ss
Conductor	See tables for options
Insulation	Alumina ceramic
<b>Vacuum range HV</b>	$1 \times 10^{-8}$ mbar
<b>Temperature range<sup>2</sup></b>	
Baseplate	-20°C to 150°C
<b>Dimensions</b>	Reference only, subject to change

<sup>1</sup> See intended operating parameters in introductory section

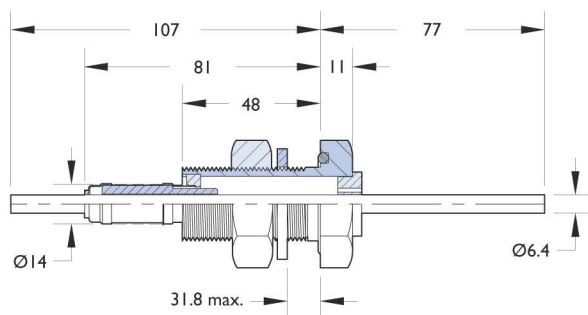
<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

## Feedthroughs – electrical and optical

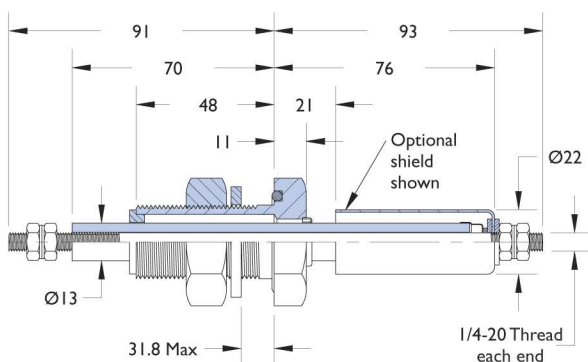
## HV Series



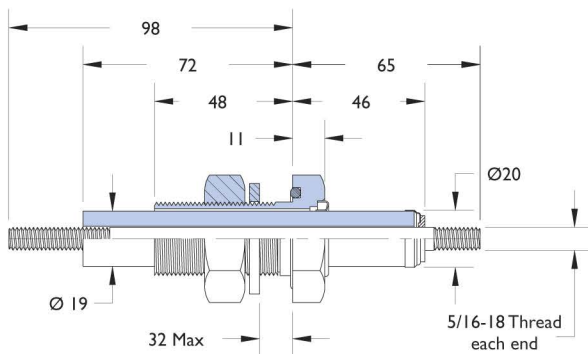
3kV Baseplate mount



5kV Baseplate mount



12kV Baseplate mount



15kV Baseplate mount

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

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Baseplate 3kV



Volts	Amps	Conductor material	Reference	Part number
3kV	250	Copper	250C-BI	9454001

Connectors must be ordered separately

Baseplate 5kV



Volts	Amps	Conductor material	Reference	Part number
5kV	100	Copper	100C-BI	9454002
5kV	50	Nickel	50N-BI	9454003
5kV	5	Stainless steel	5S-BI	9454004

Connectors must be ordered separately

Baseplate 12kV



Volts	Amps	Conductor material	Type	Reference	Part number
12kV	100	Copper	Exposed	100C-B12-E	9454005
12kV	100	Copper	Shielded	100C-B12-S	9454008

Connectors must be ordered separately

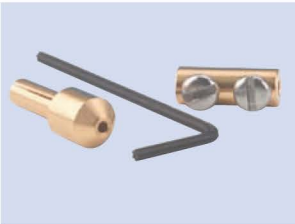
Baseplate 15kV



Volts	Amps	Conductor material	Reference	Part number
15kV	150	Copper	150C-B15	9454015

Connectors must be ordered separately

Accessories



Accessory type	Material	Quantity per pack	Reference	Part number
Power in-line	BeCu	10	PIL-260	9924008
In-line clamp	Copper	1	IPLC	991536
Right-angle clamp	Copper	1	RAPC	991537

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

## Section 6.5

# Power Water-cooled

3,000 to 5,000V / 1 pin

## Feedthroughs – electrical and optical



## Features

- Single-pin configuration – tubular construction
- Medium power
- 3 different conductor materials available
- In-vacuum accessories available – see section 6.7
- Custom feedthrough configurations available upon request

## Specifications

**Voltage<sup>1</sup>** 3,000 – 5,000V DC

**Current** See page 348

### Material

Shells 304ss

Adaptor 304ss

Conductor See tables for options

Insulation Alumina ceramic

**Vacuum range** UHV/HV  $1 \times 10^{-10}$  mbar /  $1 \times 10^{-8}$  mbar

### Temperature range<sup>2</sup>

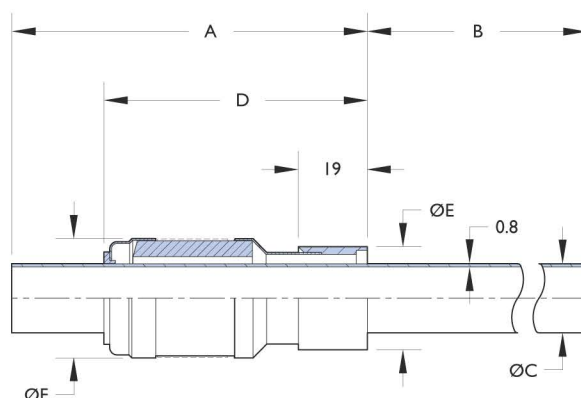
Weldable -100°C to 450°C

**Dimensions** Reference only, subject to change

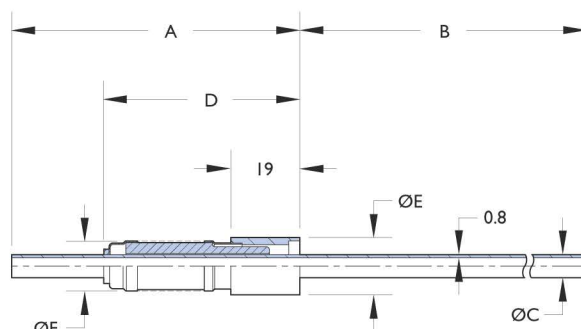
<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

## UHV and HV series



3,000V weldable



5,000V weldable

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Weldable 3kV



Conductor material	A	B	C	D	E	F	Reference	Part number
Copper	98	86	19.1	72	28	33	MCT3-CL	9461000
Copper	80	104	9.7	55	19	20	MCT3-C	9461001

Connectors must be ordered separately

Weldable 5kV



Conductor material	A	B	C	D	E	F	Reference	Part number
Copper	79	105	6.4	54	15.8	14	MCT-C	9461002
Nickel	79	105	6.4	54	15.8	14	MCT-N	9461003
Stainless steel	79	105	6.4	54	15.8	14	MCT-S	9461004

Connectors must be ordered separately

Accessories



Accessory type	Material	Quantity per pack	Reference	Part number
In-line clamp	Copper	1	IPLC	991536
Right-angle clamp	Copper	1	RAPC	991537

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

## Section 6.5

# Power Water-cooled

3,000 to 5,000V / 1 to 4 pins



## Features

- 1 to 4 pin configuration – tubular construction
- Medium power
- 3 different conductor materials available
- In-vacuum accessories available – see section 6.7
- Standard vacuum mounting style
- Custom feedthrough configurations available upon request

## Specifications

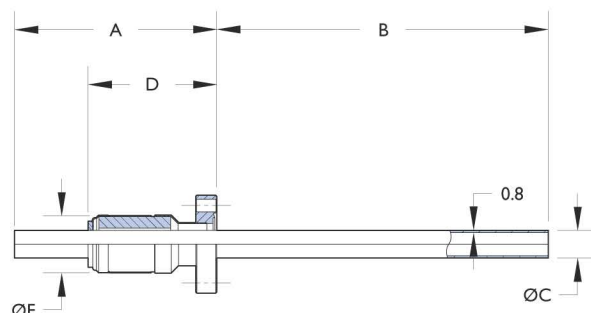
<b>Voltage<sup>1</sup></b>	3,000 – 5,000V DC
<b>Current</b>	See page 348
<b>Material</b>	
Shells	304ss
Adaptor	304ss
Conductor	See tables for options
Insulation	Alumina ceramic
<b>Vacuum range UHV</b>	$1 \times 10^{-10}$ mbar
<b>Temperature range<sup>2</sup></b>	
CF Flange mounted	-100°C to 450°C
<b>Dimensions</b>	Reference only, subject to change

<sup>1</sup> See intended operating parameters in introductory section

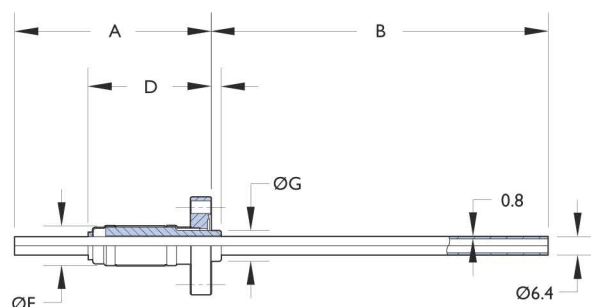
<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

## Feedthroughs – electrical and optical

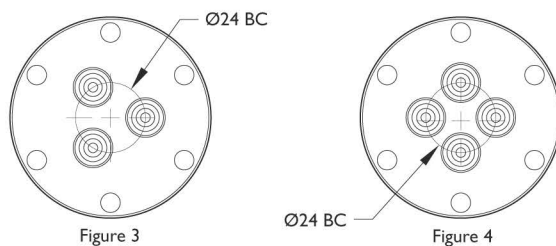
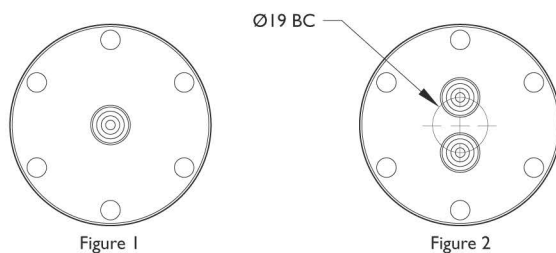
### UHV Series



3,000V CF mount



5,000V CF mount



End view Air-side

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Power Water-cooled

3,000 to 5,000V / 1 to 4 pins



CF 3kV



No. of pins	Conductor material	Flange mount	End view figure	A	B	C	D	E	Reference	Part number
1	Copper	DN40CF	1	99	85	19.1	74	33	MCT3-C600-C40	9462000
1	Copper	DN16CF	1	68	116	9.7	43	20	MCT3-C600-C16	9462001

Connectors must be ordered separately

CF 5kV



No. of pins	Conductor material	Flange mount	End view figure	A	B	D	F	G	H	Reference	Part number
1	Copper	DN16CF	1	68	116	42	14	11	4	MCT-C-C16	9462002
1	Nickel	DN16CF	1	68	116	42	14	11	4	MCT-N-C16	9462003
1	Stainless steel	DN16CF	1	68	116	42	14	11	4	MCT-S-C16	9462004
1	Copper	DN40CF	1	81	103	55	14	–	–	MCT-C-C40	9462005
1	Nickel	DN40CF	1	81	103	55	14	–	–	MCT-N-C40	9462006
1	Stainless steel	DN40CF	1	81	103	55	14	–	–	MCT-S-C40	9462007
2	Copper	DN40CF	2	81	103	55	33	–	–	MCT-C-2-C40	9462008
2	Nickel	DN40CF	2	81	103	55	33	–	–	MCT-N-2-C40	9462009
2	Stainless steel	DN40CF	2	81	103	55	33	–	–	MCT-S-2-C40	9462010
3	Copper	DN40CF	3	81	103	55	38	–	–	MCT-C-3-C40	9462011
3	Nickel	DN40CF	3	81	103	55	38	–	–	MCT-N-3-C40	9462012
3	Stainless steel	DN40CF	3	81	103	55	38	–	–	MCT-S-3-C40	9462013
4	Copper	DN40CF	4	81	103	55	38	–	–	MCT-C-4-C40	9462014
4	Nickel	DN40CF	4	81	103	55	38	–	–	MCT-N-4-C40	9462015
4	Stainless steel	DN40CF	4	81	103	55	38	–	–	MCT-S-4-C40	9462016

Connectors must be ordered separately

Accessories

RAPC



Accessory type	Material	Quantity per pack	Reference	Part number
In-line clamp	Copper	1	IPLC	991536
Right angle clamp	Copper	1	RAPC	991537

IPLC



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## Section 6.5

## Power Water-cooled

3,000 to 5,000V / 1 to 4 pins



## Features

- 1 to 4 pin configuration – tubular construction
- Medium power
- 3 different conductor materials available
- In-vacuum accessories available – see section 6.7
- Standard vacuum mounting style
- Custom feedthrough configurations available upon request

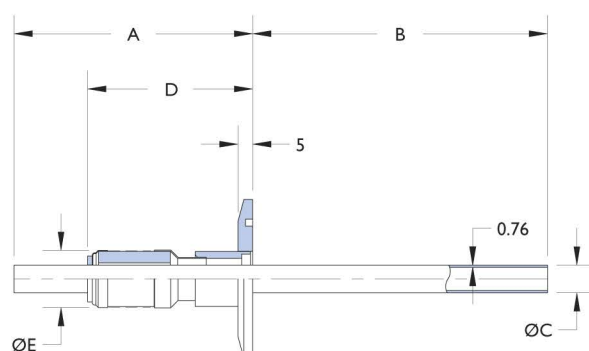
## Specifications

<b>Voltage<sup>1</sup></b>	3,000 – 5,000V DC
<b>Current</b>	See page 348
<b>Material</b>	
Shells	304ss
Adaptor	304ss
Conductor	See tables for options
Insulation	Alumina ceramic
<b>Vacuum range HV</b>	$1 \times 10^{-8}$ mbar
<b>Temperature range<sup>2</sup></b>	
ISO KF Flange mounted feedthrough	-20°C to 150°C
<b>Dimensions</b>	Reference only, subject to change

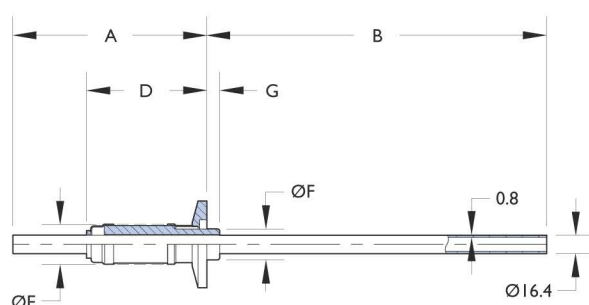
<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

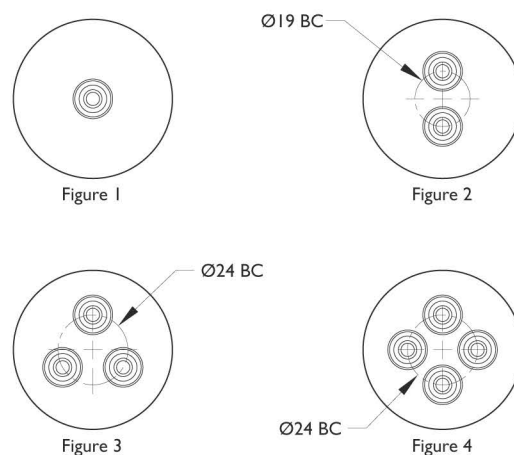
## HV Series



3,000V ISO KF mount



5,000V ISO KF mount



End view Air-side

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Power Water-cooled

3,000 to 5,000V / 1 to 4 pins



ISO KF 3kV



No. of pins	Amps	Conductor material	Flange mount	End view figure	A B D E F G						Reference	Part number
					A	B	D	E	F	G		
1	3kV	Copper	DN16KF	1	99	85	19	73	13	33	MCT3-C-K40	9463000
1	3kV	Copper	DN16KF	1	6	102	9	57	7	20	MCT3-CL-K40	9463001

For connectors use a high current electrical clamp terminal

CF 5kV



No. of pins	Amps	Conductor material	Flange mount	End view figure	A B D E F G						Reference	Part number
					A	B	D	E	F	G		
1	5kV	Copper	DN16KF	1	66	118	41	14	11	6	MCT-C-K16	9463002
1	5kV	Nickel	DN16KF	1	66	118	41	14	11	6	MCT-N-K16	9463003
1	5kV	Stainless steel	DN16KF	1	66	118	41	14	11	6	MCT-S-K16	9463004
1	5kV	Copper	DN40KF	1	80	105	54	14	–	–	MCT-C-K40	9463005
1	5kV	Nickel	DN40KF	1	80	105	54	14	–	–	MCT-N-K40	9463006
1	5kV	Stainless steel	DN40KF	1	80	105	54	14	–	–	MCT-S-K40	9463007
2	5kV	Copper	DN40KF	2	80	105	54	33	–	–	MCT-C-2-K40	9463008
2	5kV	Nickel	DN40KF	2	80	105	54	33	–	–	MCT-N-2-K40	9463009
2	5kV	Stainless steel	DN40KF	2	80	105	54	33	–	–	MCT-S-2-K40	9463010
3	5kV	Copper	DN40KF	3	82	102	57	38	–	–	MCT-C-3-K40	9463011
3	5kV	Nickel	DN40KF	3	82	102	57	38	–	–	MCT-N-3-K40	9463012
3	5kV	Stainless steel	DN40KF	3	82	102	57	38	–	–	MCT-S-3-K40	9463013
4	5kV	Copper	DN50KF	4	80	105	54	38	–	–	MCT-C-4-K50	9463014
4	5kV	Nickel	DN50KF	4	80	105	54	38	–	–	MCT-N-4-K50	9463015
4	5kV	Stainless steel	DN50KF	4	80	105	54	38	–	–	MCT-S-4-K50	9463016

For connectors use a high current electrical clamp terminal

Accessories

RAPC



Accessory type	Material	Quantity per pack	Reference	Part number
In-line clamp	Copper	1	IPLC	991536
Right-angle clamp	Copper	1	RAPC	991537

For connectors use a high-current electrical clamp terminal

IPLC



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

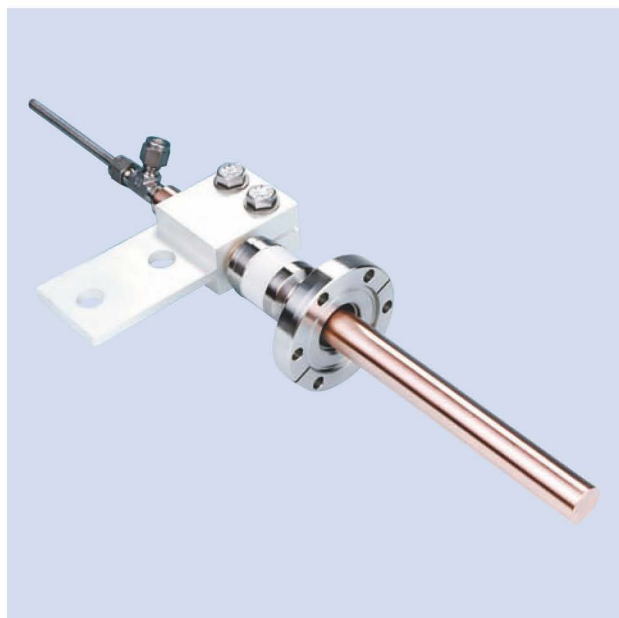
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## Section 6.5

## Power Water-cooled

3,000V / 1,000A / 1 pin

## Feedthroughs – electrical and optical



## Features

- Single-pin configuration
- High power
- Air-side water return
- In-vacuum accessories available – see section 6.7
- Standard vacuum mounting style
- Custom feedthrough configurations available upon request

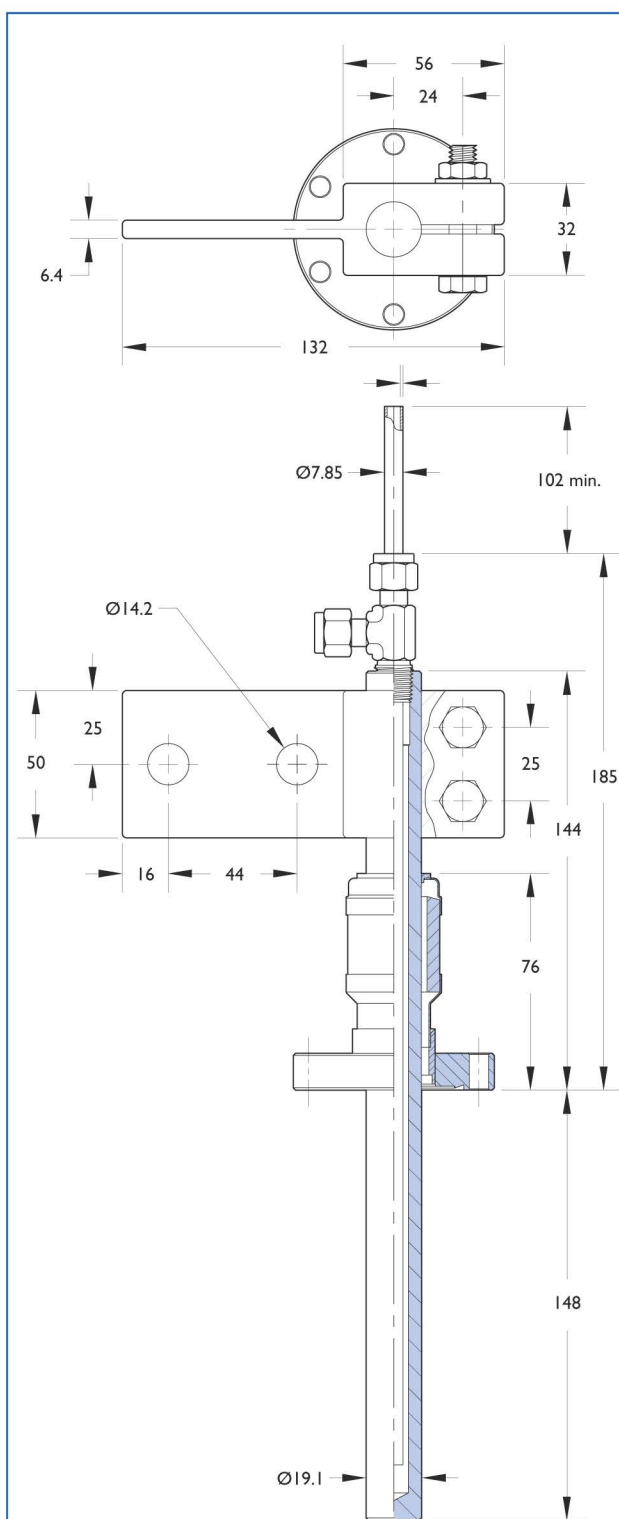
## Specifications

<b>Voltage<sup>1</sup></b>	3,000V DC
<b>Current</b>	1,000A
<b>Material</b>	
Flange	304ss
Conductor	Copper
Insulation	Alumina ceramic
<b>Vacuum range UHV</b>	$1 \times 10^{-10}$ mbar
<b>Temperature range<sup>2</sup></b>	
CF Flange mounted feedthrough	-100°C to 450°C
<b>Dimensions</b>	Reference only, subject to change

<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

## UHV Series



3,000V CF mount

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

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Power Water-cooled

3,000V / 1,000A / 1 pin



CF



Volts	Amps	Conductor Material	Flange Mount	Reference	Part number
3000	1000	Copper	DN40CF	VHC1000-C40	9462017

Power Water-cooled

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

 United Kingdom

 Germany

 France

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+ 49 (0) 2305 947 508

+ 33 (0) 437 651 750

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## Section 6.5

# Powerglove

5,000V / 25A / 1 to 4 pins



## Features

- 1 to 4 pin configuration
- High-voltage connector included
- In-vacuum accessories available
- 3 standard vacuum mounting styles
- Custom feedthrough configurations available upon request

## Specifications

<b>Voltage<sup>1</sup></b>	5,000V DC
<b>Current</b>	25A
<b>Material</b>	
Flanges	304ss
Adaptor	304ss
Conductor	Copper
Insulation	Alumina ceramic
<b>Vacuum range</b> UHV/HV	$1 \times 10^{-10}$ mbar / $1 \times 10^{-8}$ mbar
<b>Temperature range<sup>2</sup></b>	
CF Flange mounted feedthrough	-100°C to 450°C
ISO KF Flange mounted feedthrough	-20°C to 150°C
Weldable feedthrough	-100°C to 450°C
Air-side connector	-55°C to 125°C

## Dimensions

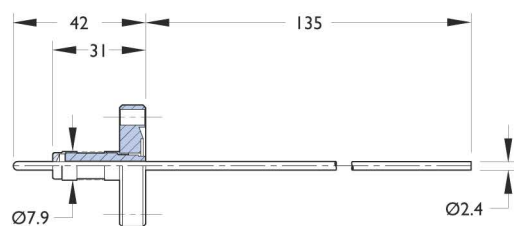
Reference only, subject to change

<sup>1</sup> See intended operating parameters in introductory section

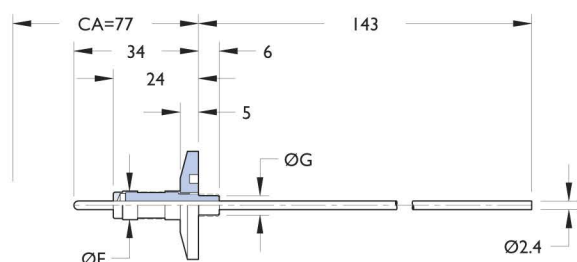
<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

## Feedthroughs – electrical and optical

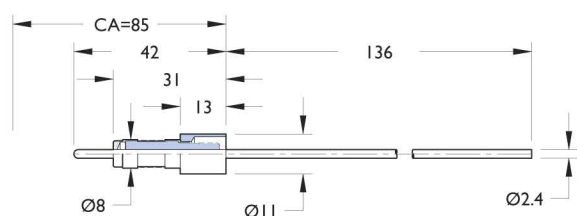
## UHV Series



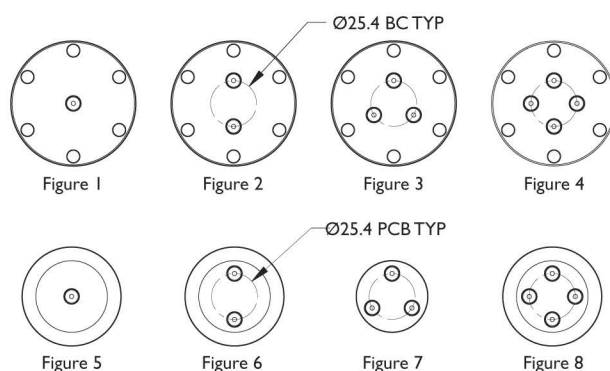
## CF mount



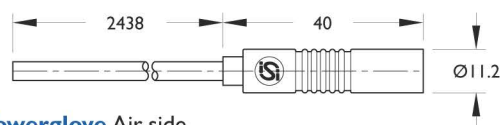
## ISO KF mount



## Weldable



## End view Air-side



## 5kV Powerglove Air-side

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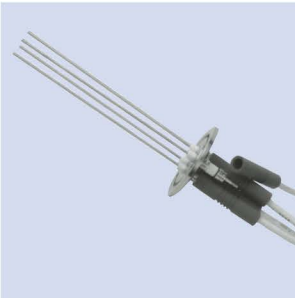
CF



No. of Pins	Volts	Amps	Conductor material	Flange mount	End view figure	Reference	Part number
1	5kV	25	Copper	DN16CF	1	PBHV5-25C-C16	9422040
1	5kV	25	Copper	DN40CF	1	PBHV5-25C-C40	9422043
2	5kV	25	Copper	DN40CF	2	PBHV5-25C-2-C40	9422046
3	5kV	25	Copper	DN40CF	3	PBHV5-25C-3-C40	9422049
4	5kV	25	Copper	DN40CF	4	PBHV5-25C-4-C40	9422052

Air-side connectors included at no extra cost

ISO KF



No. of Pins	Volts	Amps	Flange mount	E	G	End view figure	Reference	Part number
1	5kV	25	DN16KF	8	6	5	PBHV5-25C-K16	9423040
1	5kV	25	DN40KF	8	6	5	PBHV5-25C-K40	9423043
2	5kV	25	DN40KF	33	31	6	PBHV5-25C-2-K40	9423046
3	5kV	25	DN40KF	33	31	7	PBHV5-25C-3-K40	9423049
4	5kV	25	DN40KF	33	31	8	PBHV5-25C-4-K40	9423052

Air-side connectors included at no extra cost

Weldable



Volts	Amps	Conductor material	Reference	Part number
20kV	25	Copper	PBHV5-25C	9421023

Air-side connectors included at no extra cost

Accessories

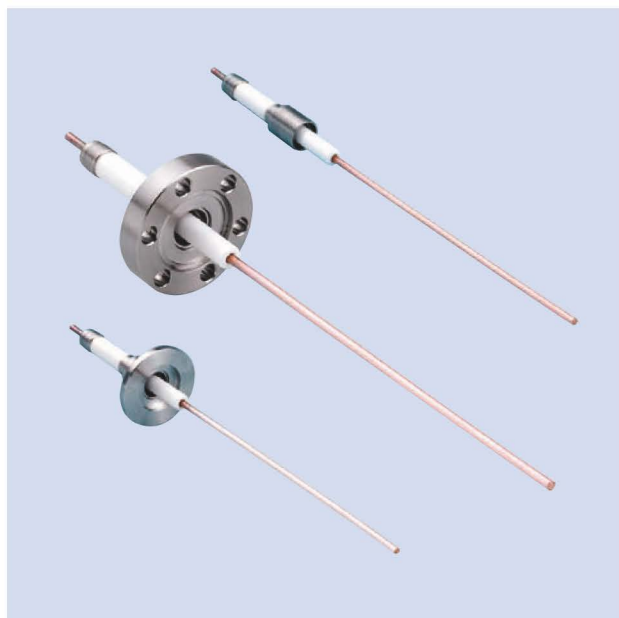


Accessory type	Material	Quantity per pack	Reference	Part number
Power push-on	BeCu	10	PPO-094	9924003
Power in-line	BeCu	10	PIL-120	9924006
Ceramic bead	Alumina	300mm	CB102	9951003

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

# Powerglove

10,000V / 25A / 1 to 4 pins



## Features

- 1 to 4 pin configuration
- High-voltage connector included
- In-vacuum accessories available – see section 6.7
- 3 standard vacuum mounting styles available
- Custom feedthrough configurations available upon request

## Specifications

**Voltage<sup>1</sup>** 10,000V DC

**Current** 25A

### Material

Flanges 304ss  
Adaptor 304ss  
Conductor Copper  
Insulation Alumina ceramic

**Vacuum range** UHV/HV  $1 \times 10^{-10}$  mbar /  $1 \times 10^{-8}$  mbar

### Temperature range<sup>2</sup>

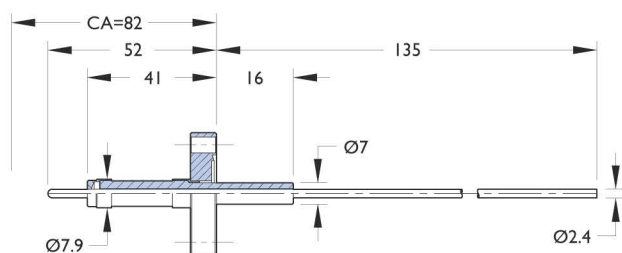
CF Flange mounted feedthrough -100°C to 450°C  
ISO KF Flange mounted feedthrough -20°C to 150°C  
Weldable feedthrough -100°C to 450°C  
Air-side connector -55°C to 125°C

**Dimensions** Reference only, subject to change

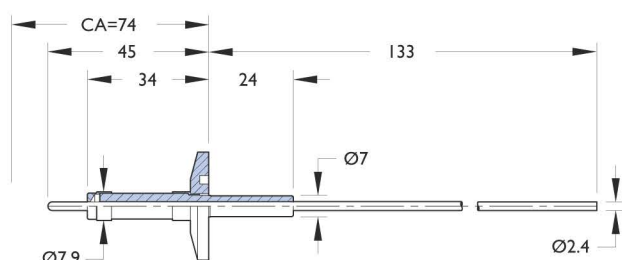
<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

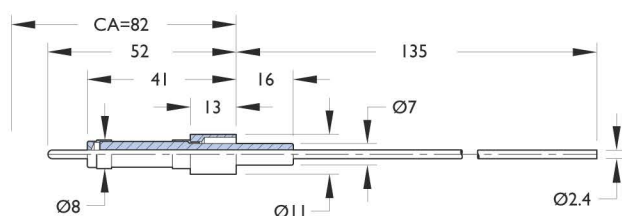
## UHV and HV series



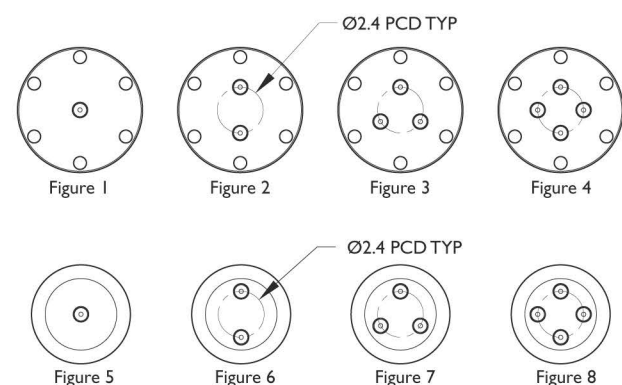
### CF Mount



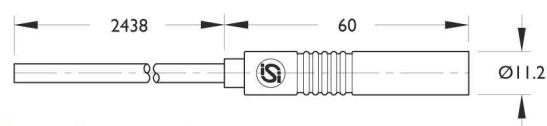
### ISO KF Mount



### Weldable



### End view Air-side



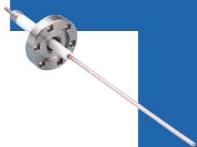
### 10kV Powerglove Air-side

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

United Kingdom +44 (0) 1825 280 450 sales@mdcvacuum.co.uk  
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MDC Vacuum Europe  
**MDC**  
www.mdcvacuum.eu





CF



No. of pins	Volts	Amps	Flange mount	End view figure	Conductor material	Reference	Part number
1	10kV	25	DN16CF	1	Copper	HV10-25C-1-C16	9432016
1	10kV	25	DN40CF	1	Copper	HV10-25C-1-C40	9432019
2	10kV	25	DN40CF	2	Copper	HV10-25C-2-C40	9432022
3	10kV	25	DN40CF	3	Copper	HV10-25C-3-C40	9432025
4	10kV	25	DN40CF	4	Copper	HV10-25C-4-C40	9432028

Air-side connectors included at no extra cost

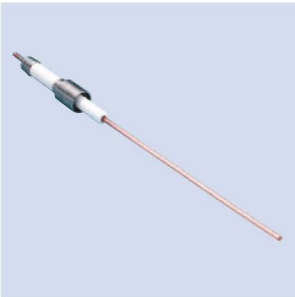
ISO KF



No. of pins	Volts	Amps	Flange mount	End view figure	Conductor material	Reference	Part number
1	10kV	25	DN16KF	5	Copper	HV10-25C-1-K16	9433016
1	10kV	25	DN40KF	5	Copper	HV10-25C-1-K40	9433019
2	10kV	25	DN40KF	6	Copper	HV10-25C-2-K40	9433022
3	10kV	25	DN40KF	7	Copper	HV10-25C-3-K40	9433025
4	10kV	25	DN40KF	8	Copper	HV10-25C-4-K40	9433028

Air-side connectors included at no extra cost

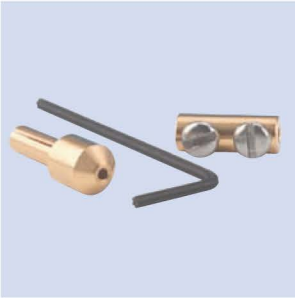
Weldable



Volts	Amps	Conductor material	Reference	Part number
20kV	25	Copper	PBHV20-25C	9431016

Air-side connectors included at no extra cost

Accessories

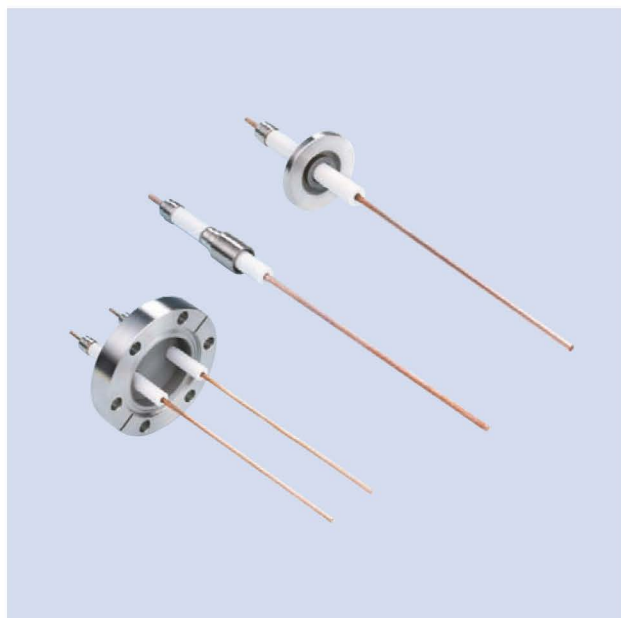


Accessory type	Material	Quantity per pack	Reference	Part number
Power push-on	BeCu	10	PPO-094	9924003
Power in-line	BeCu	10	PIL-120	9924006
Ceramic bead	Alumina	30mm	CB102	9951003

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

# Powerglove

20,000V / 25A / 1 to 4 pins



## Features

- 1 to 4 pin configuration
- High-voltage connector included
- In-vacuum accessories available
- 3 standard vacuum mounting styles available
- Custom feedthrough configurations available upon request

## Specifications

**Voltage**<sup>1</sup> 20,000V DC

**Current** 25A

### Material

Flanges	304ss
Adaptor	304ss
Conductor	Copper
Insulation	Alumina ceramic

**Vacuum range** UHV/HV  $1 \times 10^{-10}$  mbar /  $1 \times 10^{-8}$  mbar

### Temperature range<sup>2</sup>

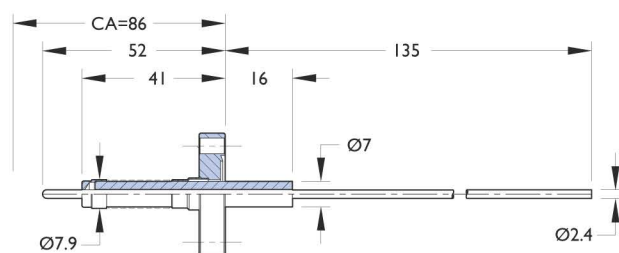
CF Flange mounted feedthrough	-100°C to 450°C
ISO KF Flange mounted feedthrough	-20°C to 150°C
Weldable feedthrough	-100°C to 450°C
Air-side connector	-55°C to 125°C

**Dimensions** Reference only, subject to change

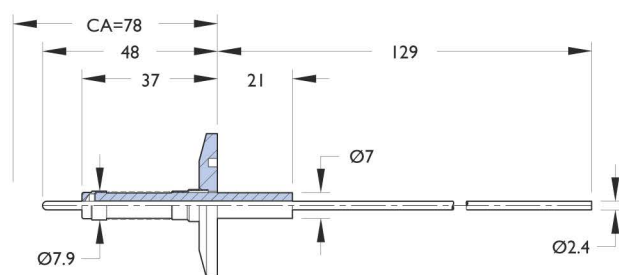
<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

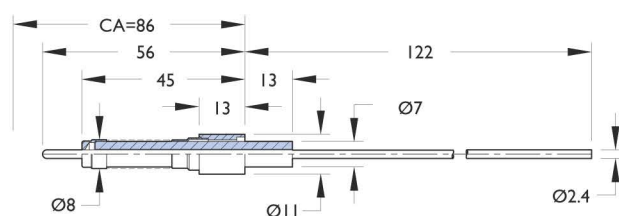
## UHV and HV series



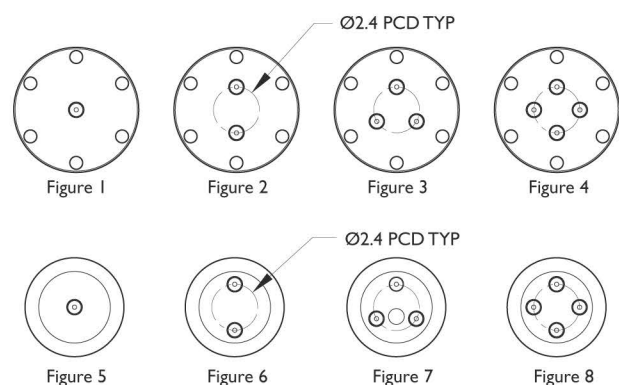
CF Mount



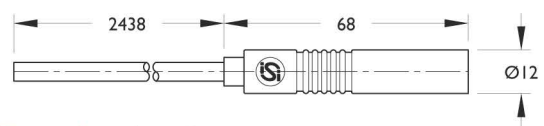
ISO KF Mount



Weldable



End view Air-side



20kV Powerglove Air-side

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

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CF



No. of pins	Volts	Amps	Flange mount	End view figure	Conductor material	Reference	Part number
1	20kV	25	DN16CF	1	Copper	PBHV20-25C-C16	9432043
1	20kV	25	DN40CF	1	Copper	PBHV20-25C-C40	9432046
2	20kV	25	DN40CF	2	Copper	PBHV20-25C-2-C40	9432049
3	20kV	25	DN40CF	3	Copper	PBHV20-25C-3-C40	9432052
4	20kV	25	DN40CF	4	Copper	PBHV20-25C-4-C40	9432055

Air-side connectors included at no extra cost

ISO KF



No. of pins	Volts	Amps	Flange mount	End view figure	Conductor material	Reference	Part number
1	20kV	25	DN16KF	5	Copper	PBHV20-25C-K16	9433043
1	20kV	25	DN40KF	5	Copper	PBHV20-25C-K40	9433046
2	20kV	25	DN40KF	6	Copper	PBHV20-25C-2-K40	9433049
3	20kV	25	DN40KF	7	Copper	PBHV20-25C-3-K40	9433052
4	20kV	25	DN40KF	8	Copper	PBHV20-25C-4-K40	9433055

Air-side connectors included at no extra cost.

Weldable



Volts	Amps	Conductor material	Reference	Part number
20kV	25	Copper	PBHV20-25C	9431016

Air-side connectors included at no extra cost

Accessories

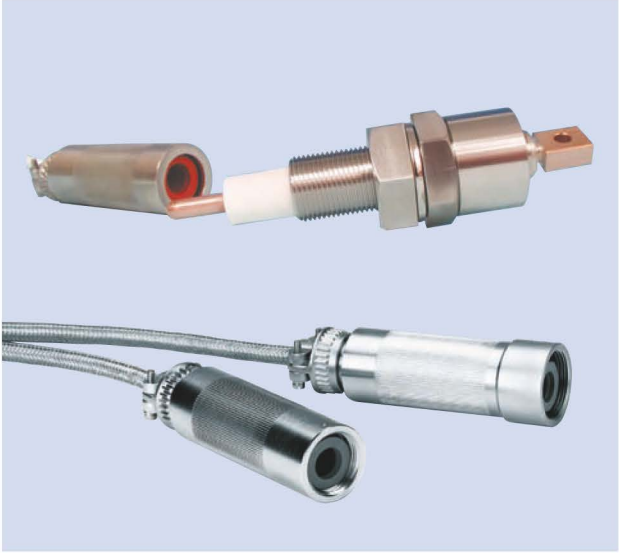


Accessory type	Material	Quantity per pack	Reference	Part number
Power push-on	BeCu	10	PPO-094	9924003
Power in-line	BeCu	10	PIL-120	9924006
Ceramic bead	Alumina	300mm	CB102	9951003

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



Section 6.5  
**Powerglove**  
15,000V / 70A



**Features**

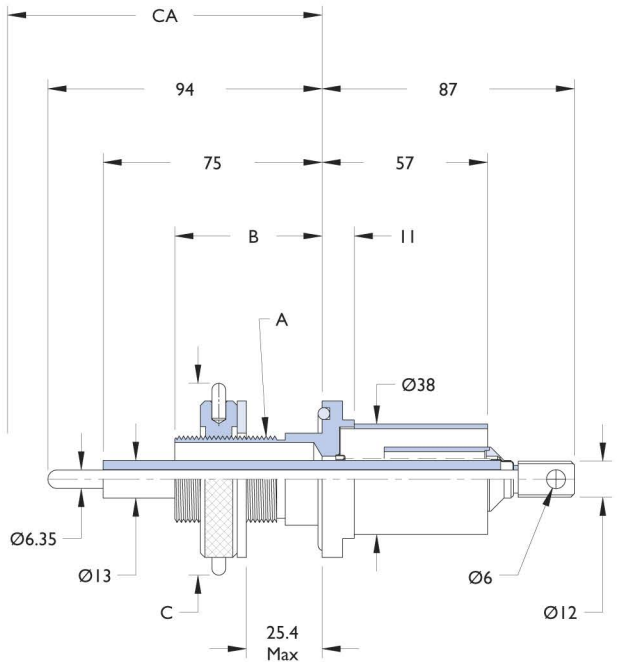
- Single pin configuration
- High voltage
- High power
- Standard 25mm, 32mm and 34mm baseplate mounts available
- Custom feedthrough configurations available upon request

**Specifications**

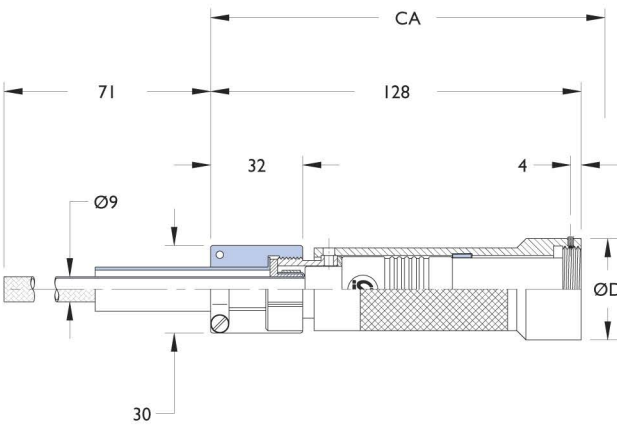
<b>Voltage<sup>1</sup></b>	15,000V DC
<b>Current</b>	70A
<b>Material</b>	
Baseplate	304ss
Adaptor	304ss
Conductor	Copper
Insulation	Alumina ceramic
<b>Vacuum range</b> UHV/HV	$1 \times 10^{-10}$ mbar / $1 \times 10^{-8}$ mbar
<b>Temperature range<sup>2</sup></b>	
Baseplate	-100°C to 450°C
Air-side connector	-55°C to 125°C
<b>Dimensions</b>	Reference only, subject to change

<sup>1</sup> See intended operating parameters in introductory section  
<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

**UHV and HV series**



**Baseplate mount 70A**

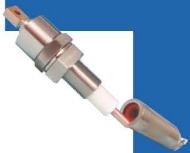


**PowerBoot® lockout connector**

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

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Baseplate



Volts	Amps	Mount size	Thread A	B	C	CA	Reference	Part number
15kV	70	25.4	1-14 UNS	48	57	165	PBHV15-70C-25B	9454012
15kV	70	32	130 x 1.5mm	51	66	168	PBHV15-70C-32B	9454013
15kV	70	32	130 x 1.5mm	51	66	168	PBHV15-70C-34B	9454014

Air-side connectors included at no extra cost

PowerBoot® Lockout



Volts	Mount size	D	CA	Reference	Part number
15kV	25.4mm	32	165	PB15-25	9924072
15kV	32 & 34mm	35	168	PB15-32/34	9924073

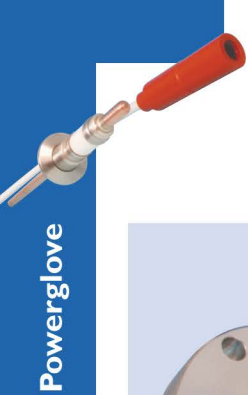
Air-side connectors included at no extra cost

Accessories



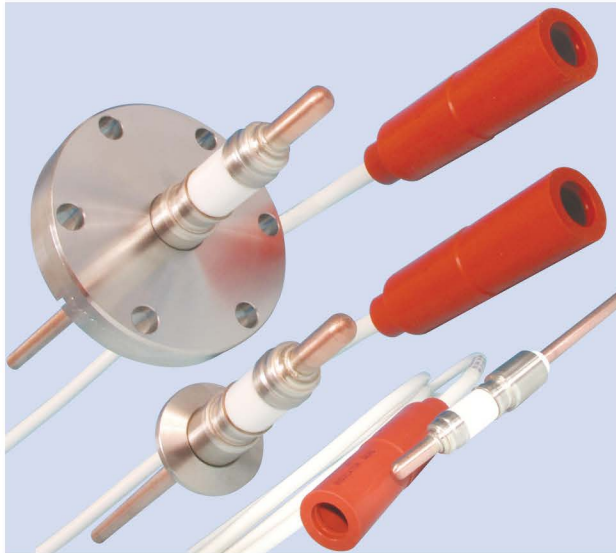
Accessory type	Material	Quantity per pack	Reference	Part number
Power in-line	BeCu	10	PIL-260	9924008

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



# Powerglove

15,000V / 70A / 1 and 2 pins



## Features

- 1 and 2-pin configuration
- High power connector included
- 3 standard mounting styles
- Custom feedthrough configurations available upon request

## Specifications

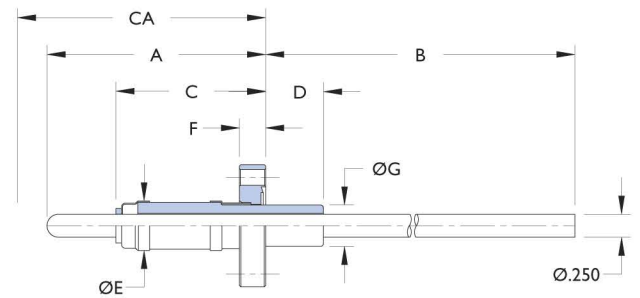
<b>Voltage<sup>1</sup></b>	15,000V DC
<b>Current</b>	70A
<b>Material</b>	
Baseplate	304ss
Adaptor	304ss
Conductor	Copper
Insulation	Alumina ceramic
<b>Vacuum range</b> UHV/HV	$1 \times 10^{-10}$ mbar / $1 \times 10^{-8}$ mbar
<b>Temperature range<sup>2</sup></b>	
CF Flange mounted feedthrough	-100°C to 450°C
ISO KF Flange mounted feedthrough	-20°C to 150°C
Weldable feedthrough	-100°C to 450°C
Air-side connector	-55°C to 125°C

**Dimensions** Reference only, subject to change

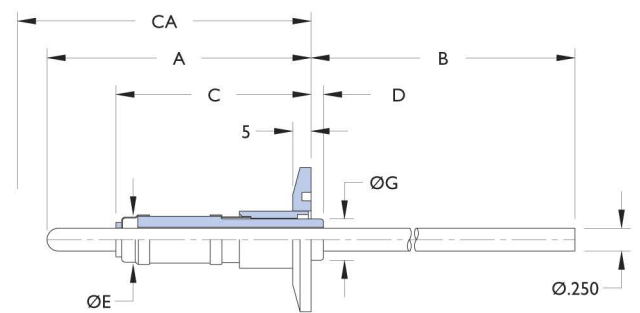
<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

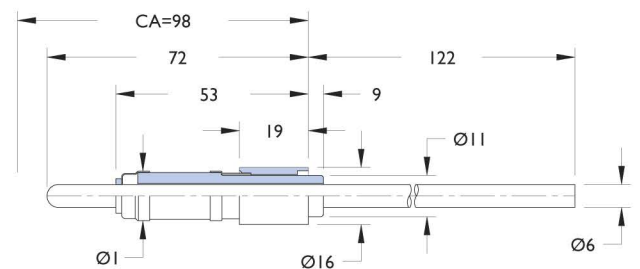
## UHV and HV series



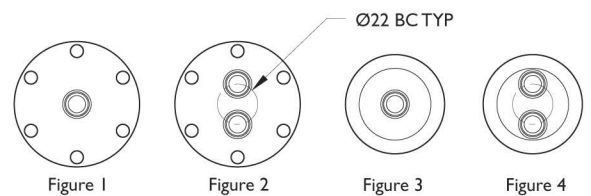
CF Mount



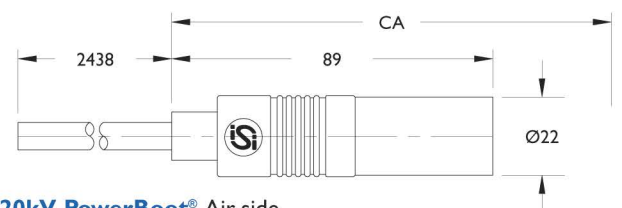
ISO KF Mount



Weldable



End view Air-side



20kV PowerBoot® Air-side

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

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CF



No. of pins	Volts	Amps	Flange mount	End view fig.	A	B	C	D	E	F	G	CA	Reference	Part number
1	15kV	70	DN16CF	1	60	124	41	16	14	7	11	101	PBHV15-70C-C16	9452100
1	15kV	70	DN40CF	1	74	110	55	2	14	13	11	115	PBHV15-70C-2-C40	9452101
2	15kV	70	DN40CF	2	74	110	55	2	36	13	34	115	PBHV15-70C-C40	9452102

Air-side connectors included at no extra cost

KF



No. of pins	Volts	Amps	Flange mount	End view fig.	A	B	C	D	E	G	CA	Reference	Part number
1	15kV	70	DN16KF	1	59	125	40	17	14	11	100	PBHV15-70C-K16	9453100
1	15kV	70	DN25KF	1	73	111	54	4	36	34	114	PBHV15-70C-2-K25	9453101
1	15kV	70	DN40KF	1	73	111	54	4	36	34	114	PBHV15-70C-K40	9453102
1	15kV	70	DN50KF	1	73	111	54	4	36	34	114	PBHV15-70C-2-K50	9453103

Air-side connectors included at no extra cost

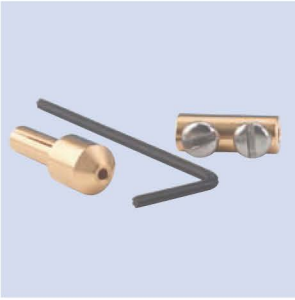
Weldable



Volts	Amps	Conductor material	Reference	Part number
15kV	70	Copper	PBHV15-70C	9451100

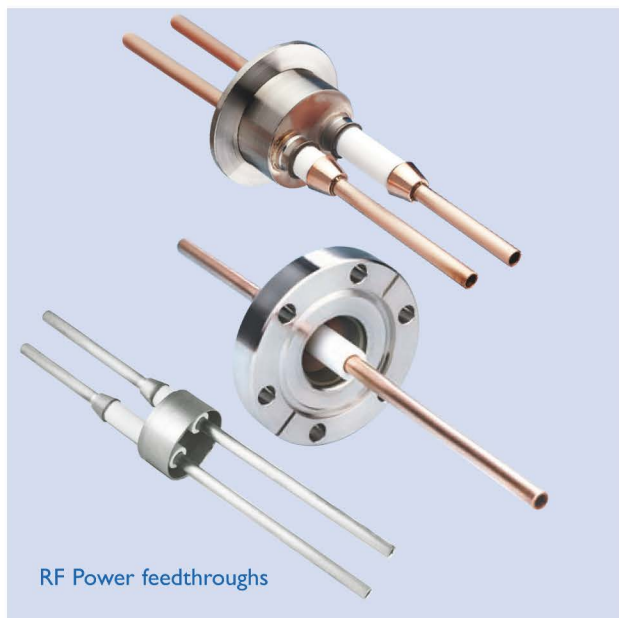
Air-side connectors included at no extra cost

Accessories



Accessory type	Material	Quantity per pack	Reference	Part number
Power in-line	BeCu	10	PIL-260	9924008

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

**Features**

- 1 and 2 tube configuration
- High voltage
- High power
- 2 different conductor materials available
- In-vacuum accessories available – see section 6.7
- Standard vacuum mounting styles
- Custom feedthrough configurations available upon request

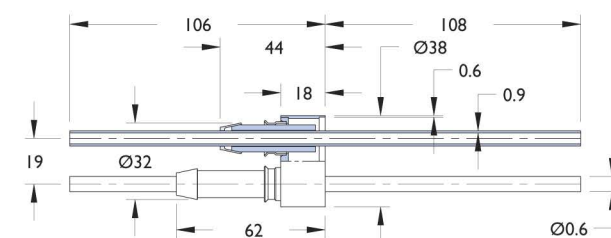
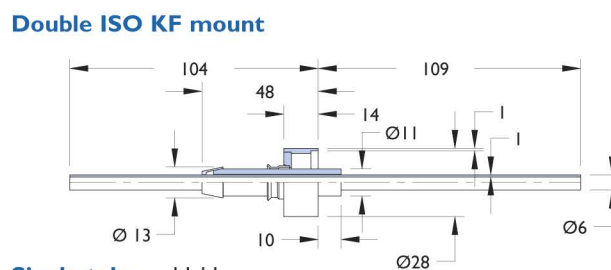
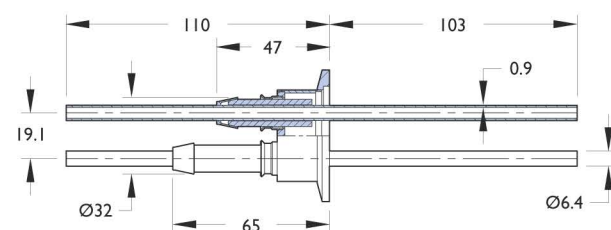
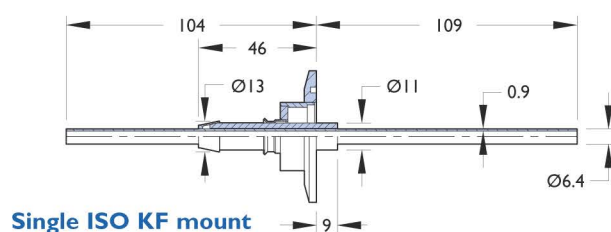
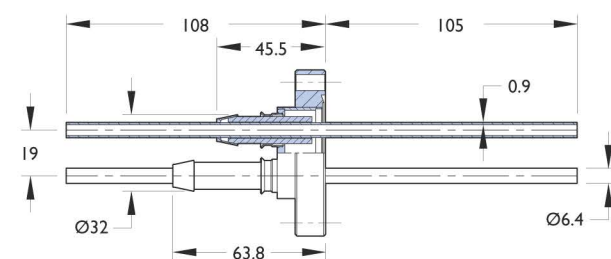
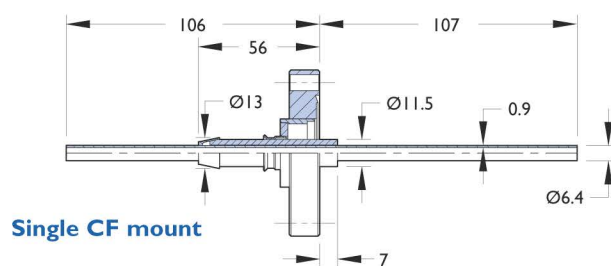
**Specifications**

<b>Voltage<sup>1</sup></b>	8,000V DC
<b>Current</b>	10kW
<b>Material</b>	
Flanges	304ss
Adaptor	304ss
Conductor	Copper
Insulation	Alumina ceramic
<b>Vacuum range</b> UHV/HV	$1 \times 10^{-10}$ mbar / $1 \times 10^{-8}$ mbar
<b>Temperature range<sup>2</sup></b>	
CF Flange mounted feedthrough	-100°C to 300°C
ISO KF Flange mounted feedthrough	-20°C to 150°C
Weldable feedthrough	-100°C to 450°C

**Dimensions** Reference only, subject to change

<sup>1</sup> See intended operating parameters in introductory section

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

**UHV and HV series**

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

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CF



No. of tubes	Flange mount	Volts	kHz	Power	Reference	Part number
1	DN40CF	8kV	450	10kW	RF10-C40	9512000
2	DN40CF	8kV	450	10kW	RF10-2-C40	9512001

ISO KF



No. of tubes	Flange mount	Volts	kHz	Power	Reference	Part number
1	DN40KF	8kV	450	35kW	RF10-K40	9513000
2	DN40KF	8kV	450	20kW	RF10-2-K40	9513001

Weldable



No. of tubes	Volts	kHz	Power	Reference	Part number
1	8000	450	35kW	RF10	9511000
2	8000	450	20kW	RF10-2	9511001

Accessories

RAPC



Accessory type	Material	Quantity per pack	Reference	Part number
In-line clamp	Copper	1	IPLC	991536
Right-angle clamp	Copper	1	RAPC	991537

IPLC



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

**Features**

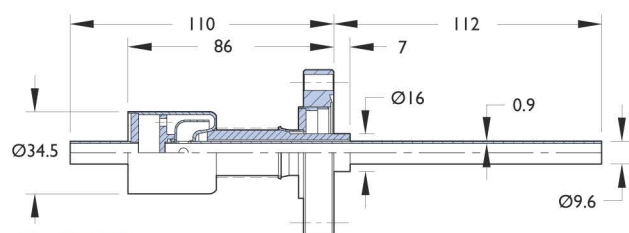
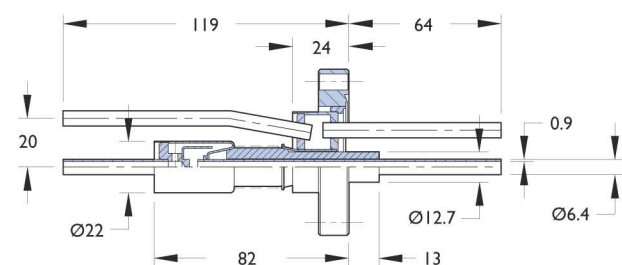
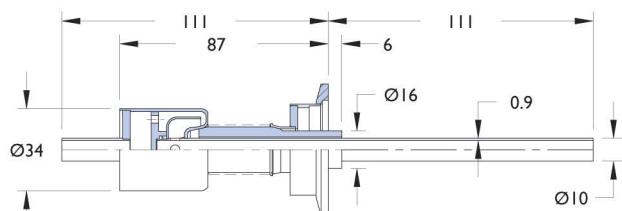
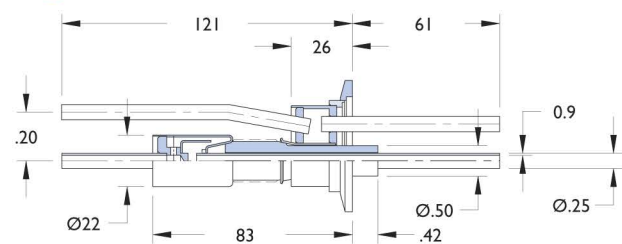
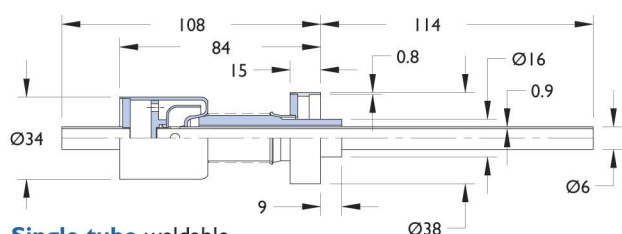
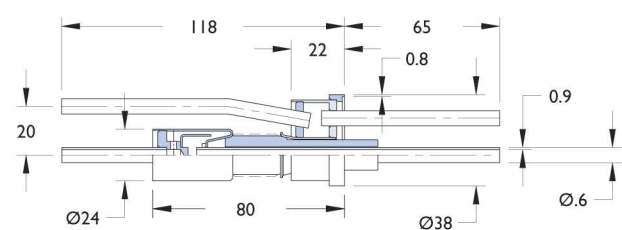
- 1 and 2 tube configuration
- High voltage
- High power
- 2 different conductor materials available
- In-vacuum accessories available
- Standard vacuum mounting styles
- Custom feedthrough configurations available upon request

**Specifications**

<b>Voltage<sup>1</sup></b>	10,000V DC
<b>Current</b>	20 and 35kW
<b>Material</b>	
Flanges	304ss
Adaptor	304ss
Conductor	Copper
Insulation	Alumina ceramic
<b>Vacuum range</b> UHV/HV	$1 \times 10^{-10}$ mbar / $1 \times 10^{-8}$ mbar
<b>Temperature range<sup>2</sup></b>	
CF Flange mounted feedthrough	-100°C to 300°C
ISO KF Flange mounted feedthrough	-20°C to 150°C
<b>Dimensions</b>	Reference only, subject to change

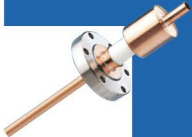
<sup>1</sup> See intended operating parameters in introductory section.

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component.

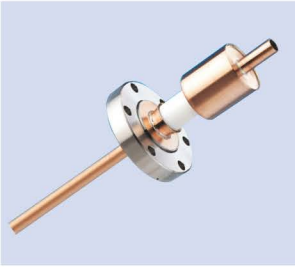
**UHV and HV series****Single CF mount****Double CF mount****Single ISO KF mount****Double ISO KF mount****Single tube weldable****Double tube weldable**

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

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CF



No. of tubes	Flange mount	Volts	kHz	Power	Reference	Part number
1	DN40CF	10kV	13.56	35kW	RF35-C40	9512020
2	DN40CF	10kV	13.56	20kW	RF20-2-C40	9512010

ISO KF

No. of tubes	Volts	MHz	Power	Flange mount	Reference	Part number
1	10	13.56	35kW	DN40CF	RF35-K40	9513011
2	10	13.56	20kW	DN40CF	RF20-2-K40	9513010

Weldable



No. of tubes	Volts	MHz	Power	Reference	Part number
1	10	13.56	35kW	RF35	9511020
2	10	13.56	20kW	RF20-2	9511010

Accessories

RAPC



Accessory type	Material	Quantity per pack	Reference	Part number
In-line clamp	Copper	1	IPLC	991536
Right angle clamp	Copper	1	RAPC	991537

IPLC



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



Breaks and envelopes

Introduction



Electrical break is the classification Caburn-MDC gives to vacuum components consisting of metal tube hardware brazed to either end of a ceramic tube. Components with diameters below 64mm are referred to as breaks and those with diameters above 64mm are referred to as envelopes.



**Liquid breaks** are used for the transmission of coolant fluids to provide an electrical break in the transmission line. Service temperature for these breaks is restricted by coolant temperature limits. Thermal gradients of 25°C per minute must also be observed with these products. These parts are rated for a maximum line pressure of 5 bar. Liquid breaks are typically installed by soldering or low-temperature brazing.

Note that subsequent brazing temperatures must not exceed 700°C.

The metal tubes provide a means of attaching these electrical breaks to other vacuum components such as flanges and chambers. The central ceramic portion provides electrical insulation between the conductive metal ends. In other words, the ceramic produces an electrical break in an otherwise continuous tube geometry.

Caburn-MDC offers three break designs for service within cryogenic, liquid and vacuum environments:

**Cryogenic breaks** are used in the transmission of cryogenic fluids to provide an electrical break in the transmission line. These breaks are suitable for service down to liquid nitrogen temperatures (-200°C). Although rated for cryogenic service, thermal gradients of 25°C per minute must be observed to preserve the life of the seal. These breaks are designed with thin metal transitions that provide flexibility at sub-zero temperatures. Cryogenic breaks can be installed by the tungsten inert gas (TIG) welding process.



 **Part numbers printed in a light blue colour indicate products that are suitable for -200°C cryogenic applications**

**Vacuum breaks and envelopes** are used in vacuum transmission lines to provide an electrical break in the transmission line. Note again that thermal gradients of 25°C per minute must be observed to preserve the life of the seal. Weldable vacuum breaks and envelopes are typically installed using any of three fusing processes – laser, electron-beam or TIG welding.

Intended operating conditions

Electrical ratings are safe operating limits. These ratings are determined by various factors, including dielectric strength, geometry and system operating pressure. Please note that all Caburn-MDC catalogue products are electrically rated for operation with one side in dry atmospheric conditions and the other side in a vacuum environment with a maximum system pressure of  $1 \times 10^{-4}$  mbar. We advise that users make allowances for deviations from stated operating parameters and take adequate safety precautions when feedthroughs are operated at high voltages or high currents.

General specifications

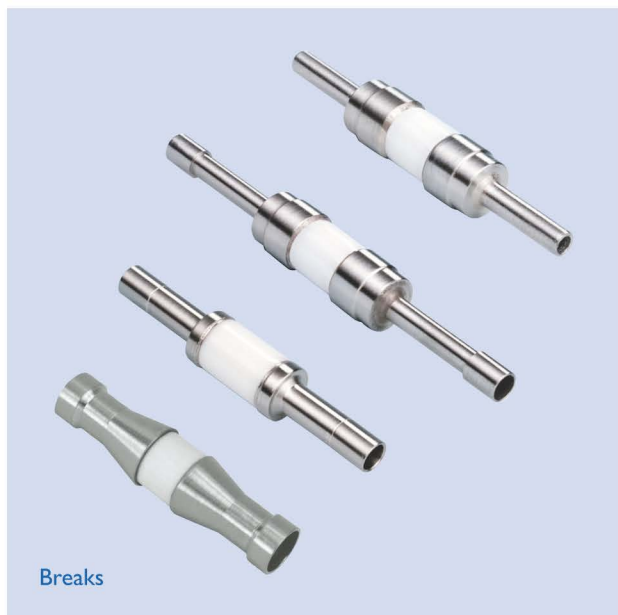
Type	Specification voltage/current	Maximum bakeout temperature	Nominal tube sizes
<b>Cryogenic and liquid</b>	3000 to 6000V DC	CF Flange 450°C ISO KF Flange 150°C Weldable 450°C	3.2, 6.4 8.0, 9.5 11.0, 12.7
<b>Vacuum breaks</b> 	to 15,000V DC	CF Flange 450°C ISO KF Flange 150°C Weldable 450°C	6.4, 9.5, 12.7, 19.1 38.1, 63.5, 102.0 152.0, 203.0
<b>Vacuum envelopes</b> 	to 40,000V DC	CF Flange 450°C ISO KF Flange 150°C Weldable 450°C	6.4, 38.1 63.5, 76.0

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



# Breaks and envelopes

Cryogenic and liquid



Breaks

## Features

- High voltage isolation to 6kV
- Nominal tube sizes from 3.2 to 11.0mm
- Custom feedthrough configurations available upon request

## Specifications

**Voltage<sup>1</sup>** 3,000 to 6,000V DC

### Material

Flanges 304ss

Adaptors See tables for options

Insulation Alumina ceramic

**Vacuum range** UHV/HV  $1 \times 10^{-10}$  mbar /  $1 \times 10^{-8}$  mbar

### Temperature range<sup>2</sup>

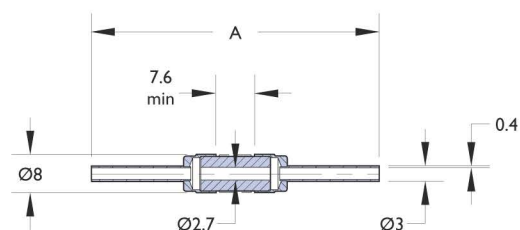
Weld or braze type -200°C to 450°C

**Dimensions** Reference only, subject to change

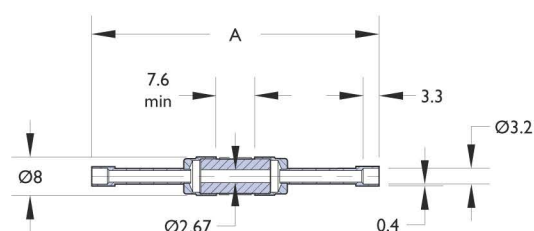
<sup>1</sup> See intended operating parameters in introductory section.

<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component.

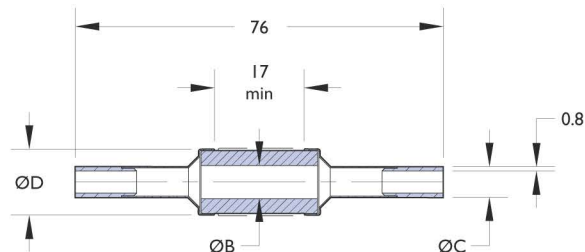
## UHV and HV series



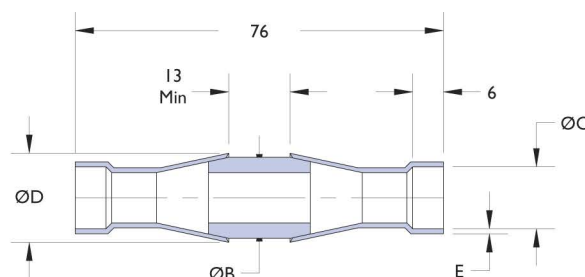
3kV Weld mount Figure 1



3kV Braze mount Figure 2



6kV Weld mount Figure 3



5kV Braze mount Figure 4

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

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Breaks and envelopes

Cryogenic and liquid



Cryogenic breaks



Nominal tubes	Figure	Volts	Type	Adaptor material	A	Reference	Part number
3.2	I	3000	Weld	Stainless steel	46	CYB3	9611002
3.2	I	3000	Swage	Stainless steel	58	CYB3-SW	9611003

 Part numbers printed in light blue indicate products that are suitable for -200°C cryogenic applications



Nominal tubes	Figure	Volts	Type	Adaptor material	A	Reference	Part number
3.2	2	3000	Braze	Stainless steel	58	CYB3-BR	9611004



Nominal tubes	Figure	Volts	Type	Adaptor material	B	C	D	Reference	Part number
7.9	3	6000	Weld	Stainless steel	6.8	7.9	14	CYB6	9611000
6.4	3	6000	Weld	Stainless steel	6.8	6.4	14	CYB6T	9611005
11.0	3	6000	Weld	Stainless steel	10.9	11.0	20	CYB6L	9611001
9.5	3	6000	Weld	Stainless steel	10.9	9.5	20	CYB6LT	9611006

 Part numbers printed in light blue indicate products that are suitable for -200°C cryogenic applications

Brazable



Nominal tubes	Volts	Type	Adaptor material	B	C	D	E	Reference	Part number
6.4	5000	Braze	Copper	5	6	15	0.8	WB5-1/4	9621000
9.5	5000	Braze	Copper	6	10	15	0.8	WB5-3/8	9621001
12.7	5000	Braze	Copper	10	13	19	1.0	WB5-1/2	9621002

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



## Section 6.7

## Breaks and envelopes

Vacuum breaks to 15,000V

Feedthroughs – electrical and optical



Breaks

## Features

- High-voltage isolation
- Nominal tube sizes from 19 to 38mm
- 3 standard vacuum mounting styles
- Custom feedthrough configurations available upon request

## Specifications

**Voltage<sup>1</sup>** 3,000 to 15,000V DC**Material**

Flanges 304ss

Adaptors 304ss

Insulation Alumina ceramic

**Vacuum range** UHV/HV  $1 \times 10^{-10}$  mbar /  $1 \times 10^{-8}$  mbar**Temperature range<sup>2</sup>**

Weld or braze type -100°C to 450°C

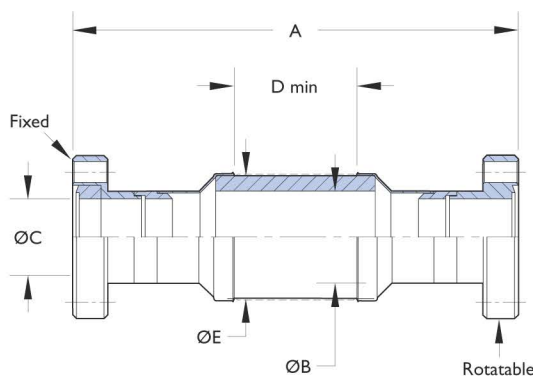
CF Flange mounted feedthrough -100°C to 450°C

ISO KF Flange mounted feedthrough -20°C to 150°C

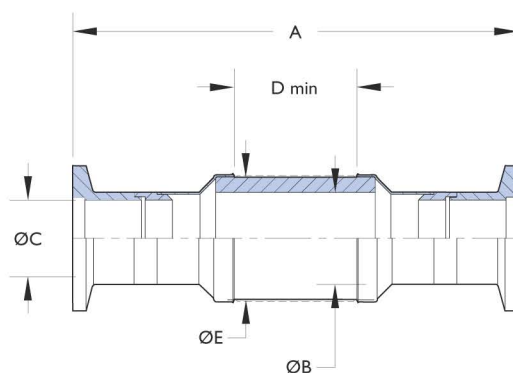
Weldable break -100°C to 450°C

**Dimensions** Reference only, subject to change<sup>1</sup> See intended operating parameters in introductory section<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

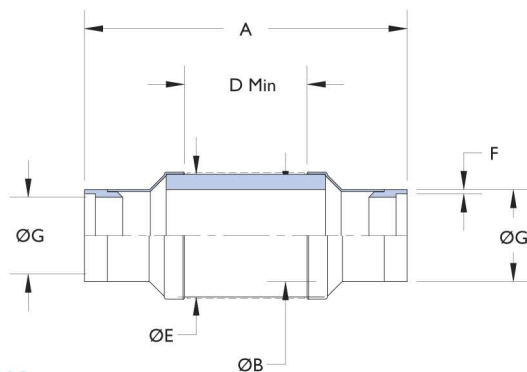
## UHV and HV series



CF Flange mount



ISO KF Flange mount



Weldable

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Breaks and envelopes

Vacuum breaks to 15,000V



CF



Nominal tubes	Volts	Flange mount	A	B	C	D	E	Reference	Part number
19.1	10kV	DN16CF	92	19.1	16	25	27	CB10-133	9632000
38.1	3kV	DN40CF	67	31.8	35	6	42	CB3-275	9632001
38.1	15kV	DN40CF	107	31.8	35	51	42	CB15-275	9632002

ISO KF



Nominal tubes	Volts	Flange mount	A	B	C	D	E	Reference	Part number
19.1	10kV	DN16KF	92	19.1	16	25	26	K075-CB10	9633000
38.1	3kV	DN40KF	64	31.8	35	6	42	K150-CB3	9633001
38.1	15kV	DN40KF	102	31.8	35	51	42	K150-CB10	9633002

Weldable



Nom. tubes	Volts	Flange mount	A	B	C	D	E	F	G	Reference	Part number
19.1	10kV	Stainless steel	66	19	19	25	26	0.8	16	CB15	9631000
38.1	3kV	Stainless steel	58	32	38	6	42	1.6	35	CB10	9631001
38.1	15kV	Stainless steel	96	32	38	6	42	1.6	35	CB3	9631002

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





# Section 6.7

## Breaks and envelopes

Vacuum breaks to 15,000V

Feedthroughs – electrical and optical



### Features

- High voltage isolation
- Nominal tube sizes from 63 to 203mm
- 2 standard vacuum mounting styles
- Custom feedthrough configurations available upon request

### Specifications

**Voltage<sup>1</sup>** 3,000 to 15,000V DC

#### Material

Flanges 304ss  
Adaptors See tables  
Insulation Alumina ceramic

**Vacuum range** UHV/ HV  $1 \times 10^{-10}$  mbar/  $1 \times 10^{-8}$  mbar

#### Temperature range<sup>2</sup>

CF Flange mounted -100°C to 450°C  
Weldable envelope -100°C to 450°C

**Dimensions** Reference only, subject to change

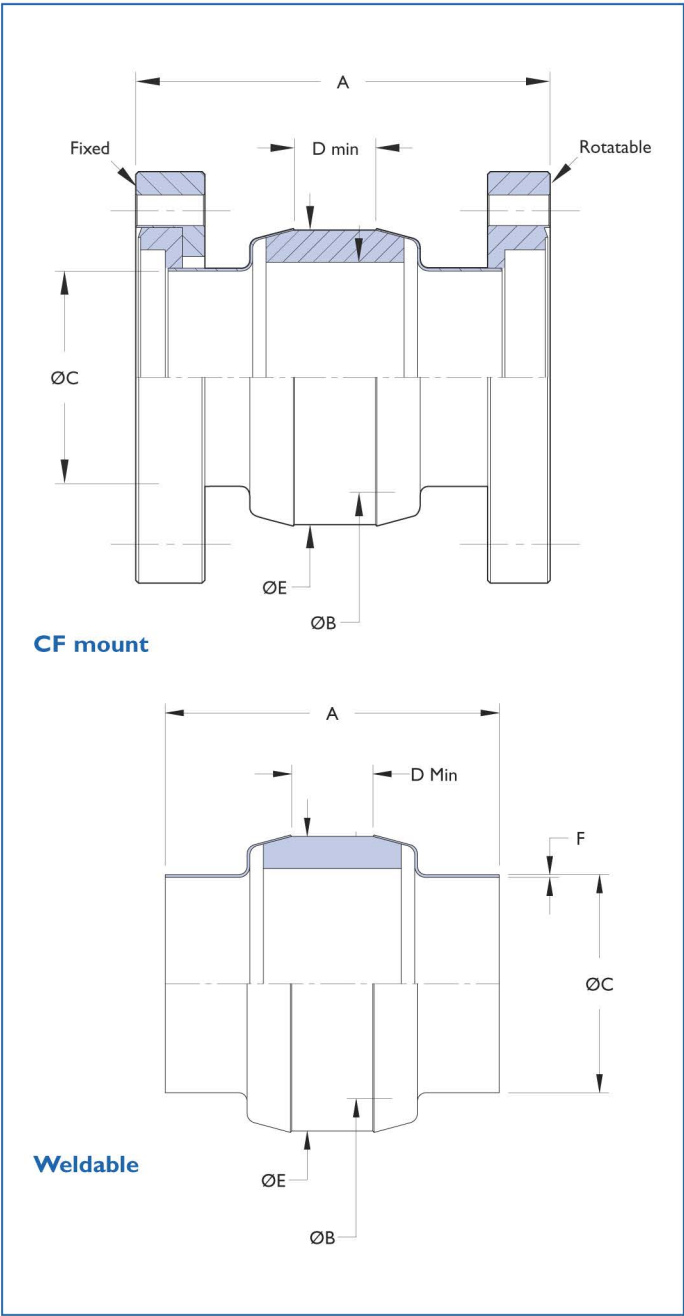
<sup>1</sup> See intended operating parameters in introductory section  
<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

Nominal tubes	Volts	Flange mount	A	B	C	D	E	Reference	Part number
63.5	8kV	DN63CF	114	63	59	19	82	CB8-450	9632003
101.6	8kV	DN100CF	117	89	95	19	108	CB8-600	9632004
152.4	15kV	DN160CF	140	152	152	38	176	CB15-800	9632005
203.2	15kV	DN200CF	146	197	197	38	224	CB15-1000	9632006

Nom. tubes	Volts	Material	A	B	C	D	E	F	Reference	Part number
63.5	8kV	Kovar®	92	63	60	19	82	.76	CB8	9631003
101.6	8kV	Kovar®	91	89	96	19	108	.76	CB8L	9631004
152.4	15kV	Kovar®	114	152	152	38	176	1.0	CB15L	9631005
203.2	15kV	Kovar®	118	197	198	38	223	1.0	CB15LL	9631006

### UHV and HV series



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

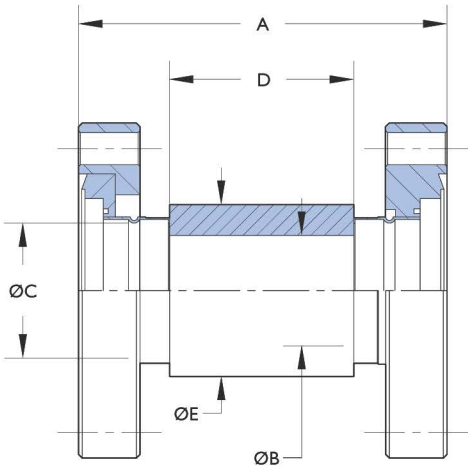
United Kingdom + 44 (0) 1825 280 450 sales@mdcvacuum.co.uk  
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Breaks and envelopes

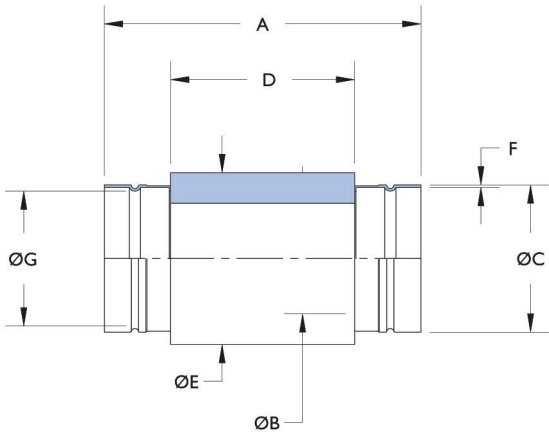
Vacuum envelopes to 40,000V



UHV and HV series



CF mount



Weldable

Features

- High voltage isolation
- Nominal tube sizes from 12.7 to 76mm
- 2 standard vacuum mounting styles
- Custom feedthrough configurations available upon request

Specifications

Voltage <sup>1</sup>	to 40,000V DC
Material	
Flanges	304ss
Adaptors	See tables
Insulation	Alumina ceramic
Vacuum range UHV/ HV	1×10 <sup>-10</sup> mbar/1×10 <sup>-8</sup> mbar
Temperature range <sup>2</sup>	
CF Flange mounted	-100°C to 450°C
Weldable envelope	-100°C to 450°C
Dimensions	Reference only, subject to change

<sup>1</sup> See intended operating parameters in introductory section  
<sup>2</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

Nominal tubes	Volts	Flange mount	A	B	C	D	E	Reference	Part number
12.7	10 kV	DN16CF	47	8	12	19	16	CB10C-133	9632007
38.1	20 KV	DN40CF	76	23	27	38	36	CB20C-275	9632008
63.5	30 KV	DN63CF	102	51	57	51	64	CB30C-450	9632009
76.2	40 KV	DN100CF	122	63	68	76	76	CB40C-600	9632010

Nominal tubes	Volts	Material	A	B	C	D	E	F	G	Reference	Part number
12.7	10kV	Kovar®	39	8	13	19	16	0.5	12	CB10L	9631007
38.1	20kV	Kovar®	65	23	30	38	36	0.5	27	CB120L	9631008
63.5	30kV	Kovar®	85	51	60	51	63	0.6	57	CB30L	9631009
76.2	40kV	Kovar®	11	63	71	76	76	0.6	68	CB40L	9631010

# 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

<b>Voltage<sup>1</sup></b>	See each table
<b>Current</b>	See each table
<b>Materials</b>	
Conductor	Silver plated copper
Insulation	Kapton® Type F film
<b>Kapton® properties</b>	
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 <sup>6</sup> Rads
<b>Vacuum range</b>	
UHV	1x10 <sup>-11</sup> mbar
<b>Temperature range<sup>2</sup></b>	
Conventional	260°C
Cryogenic	-269°C

<sup>1</sup> Electrical ratings are maximum test values.

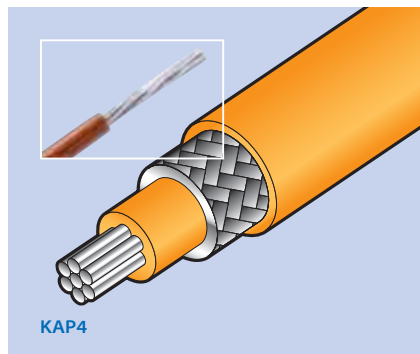
<sup>2</sup> Overall ratings must be adjusted to that of the lowest rated component.

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.

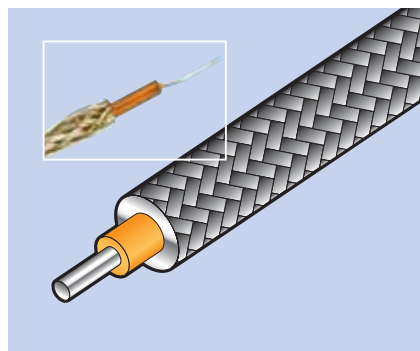
Wire strippers and glass-ceramic colour identification beads are some of the accessories offered to facilitate working with MDC Vacuum's extensive selection of in-vacuum wire and cable products.



### 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

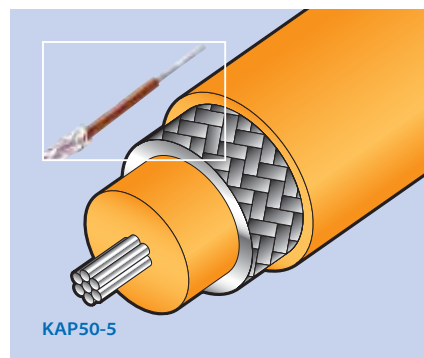
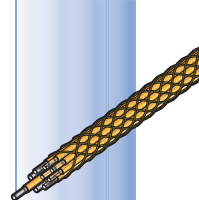
Cable type	Cable length mm	Jacket diameter	Wire diameter	Reference	Part number
Coaxial	10000	0.89	0.25	KAP3	1512004

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



### 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	<b>1512006</b>

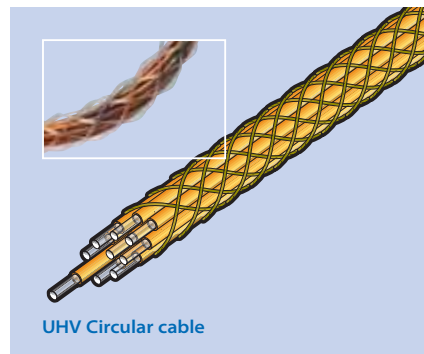
Resistance of 140Ω/km, a capacitance 95pf/m, a voltage rating of 600VAC, 2kVDC and a current of 1A.

### 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	<b>1512761</b>
9	1000	1.47	1.22	0.89	7 x 0.102	CCAB9-1000	<b>1512762</b>
9	2500	1.47	1.22	0.89	7 x 0.102	CCAB9-2500	<b>1512763</b>

9 way cable with a PEEK® woven outer sleeving.

Resistance of 244Ω/km, a voltage rating of 600VAC, 840VDC and a current of 1.5A.



### UHV Kapton® insulated and HV PTFE ribbon cable

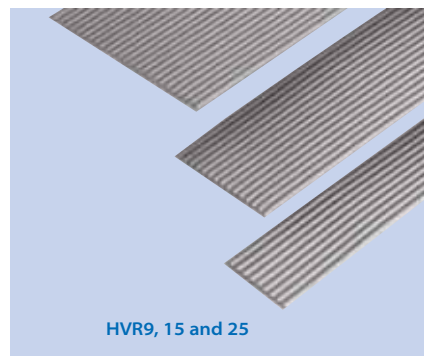
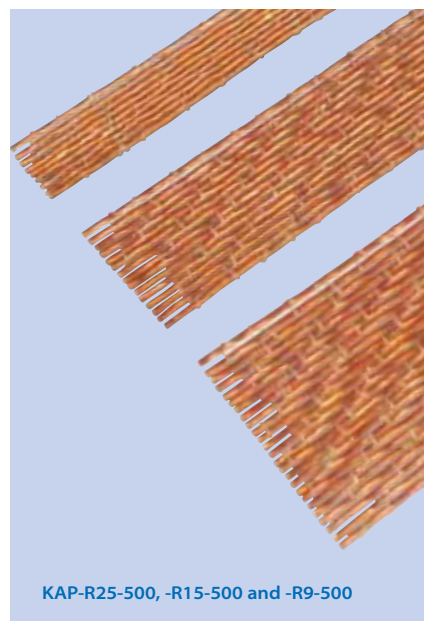
No. of wires	Cable length mm	Cable width	Cable thickness	Wire diameter	Reference	Part number
<b>UHV Kapton® insulated</b>						
9	500	11	1	7 x 0.127	KAP-R9-500	<b>1512100</b>
9	1000	11	1	7 x 0.127	KAP-R9-1000	<b>1512103</b>
9	2500	11	1	7 x 0.127	KAP-R9-2500	<b>1512150</b>
15	500	19	1	7 x 0.127	KAP-R15-500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

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

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

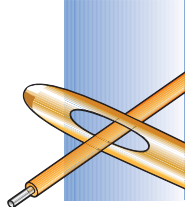
All UHV cable assemblies are bakeable to 260°C.

All HV cable assemblies are bakeable to 105°C.



All dimensions are nominal in millimetres unless specified.





# In-vacuum wiring

## Kapton® insulated

### UHV 0.12 mm cryogenic instrumentation wire

Cable type	Cable length mm	Jacket diameter	Wire diameter	Reference	Part number
Plain	10000	0.39	0.12	KAP4K-014	<b>1512081</b>

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 <sup>2</sup>	10000	0.50	7 x 0.08	KAP08 <sup>1</sup>	<b>1512001</b>
Plain <sup>3</sup>	10000	0.39	0.12	KAP012	<b>1512000</b>

<sup>1</sup> Ideally suited for delicate instrumentation applications such as UHV AFM and STM.

<sup>2</sup> Resistance of 510Ω/km.

<sup>3</sup> 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	<b>1512002</b>

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	<b>1512003</b>

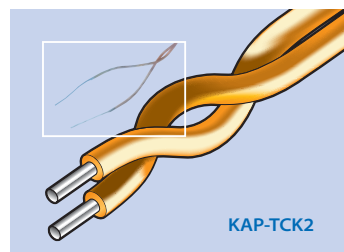
Resistance of 64.0Ω/km, a Voltage rating of 600VAC, 2kVDC and a current of 5.5A.

### UHV 1mm diameter wire

Cable type	Cable length mm	Jacket diameter	Wire diameter	Reference	Part number
Plain	10000	1.52	1.00	KAP10	<b>1512009</b>

Resistance of 22.6Ω/km, a voltage rating of 3.6kVAC, 5kVDC and a current of 10A.

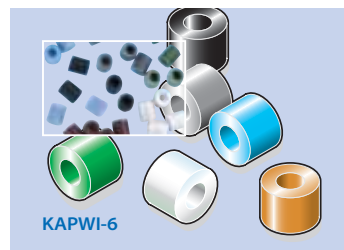
All dimensions are nominal in millimetres unless specified.



### UHV Thermocouple cryogenic instrumentation wire

Cable type	Cable length	Wire diameter	Reference	Part number
Type-K	2000	0.16	KAP-TCK2	<b>1512070</b>

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 identification beads

Cable type	Bead length	Maximum wire diameter	Reference	Part number
All	2.3	0.89	KAPWI-6	<b>1510200</b>

Ideally suited for the identification of in-vacuum Kapton® insulated wires which have no colour identification.  
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	<b>1512050</b>
All	0.25	0.80	KAPS2	<b>1512051</b>

Ideally suited for Kapton® insulation stripping.

## Vacuum sealants and glues

### Epoxy patch



#### Features

- Low vapour pressure resin sealant
- Seals without solvent evaporation
- Temperature range -45°C to 125°C
- Vacuum range 10<sup>-8</sup> mbar
- Epoxy cement in two tubes:
  - A** Resin 79g tube
  - B** Hardener 34g tube

Description	Type	Minimum temperature	Reference	Part number	£	€
Epoxy patch	Resin sealant	-45°C	EP-1	<b>432037</b>	16	23
UHV Glue 1	Conducting	150°C	UHVGLUE-H21D	<b>1260217</b>	174	219
UHV Glue 1	Conducting	270°C	UHVGLUE-H27D	<b>1260218</b>	208	262
UHV Glue 2	Non-conducting	150°C	UHVGLUE-H77	<b>1260219</b>	99	138

#### Important

Description	Hardening times	Shelf life	Resistivity
HD21	5 mins at 150°C or 12 hrs at 50°C	See pack	0.1 to 0.3mΩcm
HD27	1 hr at 150°C	See pack	0.1 to 0.3mΩcm
H77	1 hr at 150°C	See pack	-

### 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<sup>-10</sup> mbar
- 'Mixed' glue has 24 hour lifetime
- Must be cured at 150°C for one hour to harden

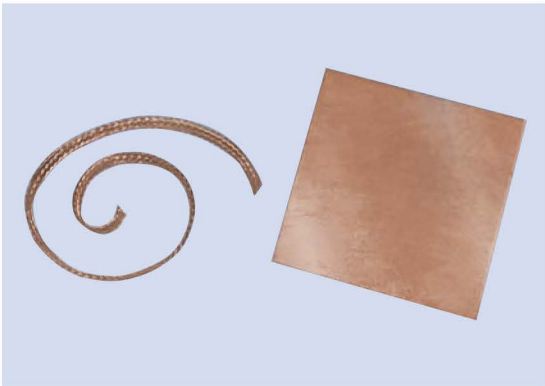


# Connectors and cables

Braid and plate

## OFHC Copper braid and plate

### OFHC6-1000 and OFHC I



### Features

- Oxygen-free, high-conductivity copper
- Suitable for use in UHV
- Suitable for use to 250°C
- Good thermal conductivity
- Good electrical conductivity

Description	Reference	Part number
OFHC Braid, flat, 1 m long	OFHC6-1000	1512200
OFHC Sheet, 100mm, 2mm thick	OFHC I	1512201

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Connectors and cables

In-vacuum wiring – Thermocouple

UHV Thermocouple insulation wire

KAP-TCK2

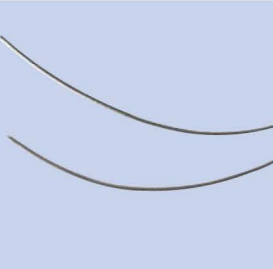


Cable type	Cable length	Wire dia.	Reference	Part number
Type-K	2 m	0.2	KAP-TCK2	1512070

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  
Alumel® (negative pole) is magnetic

Thermocouple wire pairs

W-TCC010



Features

- Price is per pair 300mm length
- Minimum order quantity 300mm
- Custom lengths on request to maximum of 1m

Cable type	Pair materials and polarity		Size	Reference	Part number
<sup>1</sup> C	Alloy 405 <sup>†</sup>	+	0.25	W-TCC010	9942002
<sup>1</sup> C	Alloy 426 <sup>†</sup>	–	0.51	W-TCC020	9942001
<sup>1</sup> C			1.27	W-TCC050	9942003
E	Chromel®	+	.25	W-TCE010	9942102
E	Constantan®	–	0.51	W-TCE020	9942101
E			1.27	W-TCE050	9942103
J	Iron	+	0.25	W-TCJ010	9942202
J	Constantan®	–	0.51	W-TCJ020	9942201
K			0.25	W-TCK010	9942302
K	Chromel®	+	0.51	W-TCK020	9942301
K	Alumel®	–	0.81	W-TCK032	9942300
K			1.27	W-TCK050	9942303
R & S	Copper	+	0.25	W-TCR010	9942402
R & S	Alloy 111	–	0.51	W-TCR020	9942401
T	Copper	+	0.25	W-TCT010	9942502
T	Constantan®	–	0.51	W-TCT020	9942501

<sup>1</sup> Extension (compensating) grades only

Thermocouple wire pairs

TCR-CHR



Features

- Price is per pair 300mm length
- Minimum order quantity 300mm
- Custom lengths on request to maximum of 1m

Cable type	Pair materials and polarity		Size	Reference	Part number
E & K	Chromel®	+	3.2	TCR-CHR	9942900
K	Alumel®	–	3.2	TCR-AL	9942910
J	Iron	+	3.2	TCR-FE	9942920
E & T	Constantan® <sup>2</sup>	+	3.2	TCR-CONET	9942930
J	Constantan® <sup>2</sup>	–	3.2	TCR-CONJ	9942940

<sup>2</sup> There are two forms of Constantan® – one is matched to iron, the other to copper and Chromel®

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# Connectors and cables

## Subminiature-D coaxial / subminiature-C connectors



Caburn-MDC offers a wide range of coaxial cables, wires, rods and insulators to provide the necessary connections into the vacuum environment.

We offer many different solutions, from vacuum-ready coaxial cables to specialized wires, such as Kapton® wire, for customized in-vacuum applications.

### Coaxial cables

All coaxial cables are constructed with vacuum grade materials and components, including stainless steel braided shielding, high purity alumina ceramic insulation, beryllium copper contacts and aluminium terminations. Cable assemblies are suitable for high temperatures and rated for high and ultra-high vacuum service. Please note that when connecting cables to feedthroughs, the effective voltage, current and temperature ratings for the set are reduced to that of its lower rated component.

#### Termination-A 200°C

Type-A terminations were designed as a convenient means of connecting to the vacuum-side of Caburn-MDC coaxial flange-mounted BNC and MHV coaxial products which have a 2.39mm conductor pin diameter. Termination-A vacuum ready cables are specifically designed to be used with Caburn-MDC between series feedthroughs as detailed in this catalogue.

#### Termination-B 200°C

Type-B terminations are basic cable terminations fitted with push-on contacts for 2.39mm conductor pin diameters, ideal for quick connect applications where non-continuous coaxial shielding is acceptable. Because of spring retention design, these units are only rated to 200°C.

#### Termination-C 400°C

Type-C terminations are also for non-continuous coaxially shielded applications, but have a temperature rating of 400°C, made possible by its mechanical, set screw clamping design.

#### Termination-D 200°C

Type-D termination is identical to Type-A termination, with the exception of a male thread adaptor. This thread adaptor enables a continuous coaxial shielded connection to floating shield BNC, MHV and SHV-5 feedthroughs. The threaded adaptor is attached to the feedthrough by means of a set screw in the adaptor base.

#### Termination BNC and MHV 400°C

Type BNC and MHV terminations were designed as high temperature versions of the traditional bayonet naval connection. They provide a means of connecting to Caburn-MDC double ended BNC and MHV coaxial feedthroughs or, for that matter, any in-vacuum component fitted with a female BNC and MHV mating connection. Please note that BNC and MHV should not be cross-mated.



#### Microdot® 400°C

Microdot® coaxial terminations are designed for use with Caburn-MDC between series BNC-Microdot® crystal sensor feedthroughs as detailed in this catalogue. These cables must be shielded when used in vacuum coating applications. Failure to do so will lead to electrical degradation and eventual failure.

### Wire and rod

Caburn offers a wide variety of bare wire and rod materials, all of which are suitable for high and ultra-high vacuum applications.

Special purpose materials such as stainless steel braided shielding and Glidcop® copper alloy wire, insulated with fish spine ceramic beads are ideal for the fabrication of vacuum ready coaxial cables and are particularly recommended for use in flexible coaxial cables.

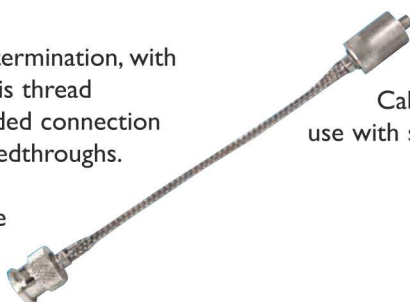
### Insulator materials

Caburn-MDC's standard ceramic Insulator components are fabricated using high purity alumina, 95% Al<sub>2</sub>O<sub>3</sub>, which is ideal for high and ultra-high vacuum service.

Alumina is a multi-crystalline form of sapphire and its properties include high compressive and mechanical strength, high wear and heat resistance, good radiation resistance and high electrical resistivity. It also has zero porosity and is hence impervious to all gases. All of these properties make alumina an excellent engineering material suitable for some of the most extreme and demanding applications.

### Tools

Caburn offers a variety of tools suitable for use with some of the products in this section.



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Section 6.8

Connectors and cables

Vacuum ready coaxial cables

General specifications for assemblies

Type	Termination type	Cable type	Application	Voltage	Current	Service temperature	Materials
Vacuum-ready coaxial cable	A, B, C, D BNC MHV Microdot®	3.18mm (1/8")	Feedthroughs	To 3kV-DC	To 15A	To 400°C	304-Stainless steel braid Aluminium hardware Beryllium-copper contacts Alumina ceramic Copper conductor
Termination kits	BNC MHV	Coaxial	Feedthroughs	–	–	200°C 400°C	–
Kapton® cable assemblies	Sub-D Sub-C Floating shield Grounded shield User-end	Instrument Coaxial	In-vacuum Air	–	–	–	–

General specifications for wire and rod materials

Type	Material	Application	Size	Voltage	Current	Service temperature
Shielding and braid	Stainless steel OFHC	–	3.2 to 6.4 6.4	–	–	–
Wire	OFHC-copper Nickel 304-Stainless steel	Electrical feedthroughs	0.8 to 2.4	–	To 30A	450°C
Rod	OFHC-copper Nickel 304-Stainless steel	High current feedthroughs	6.4	–	To 150A	450°C
In-vacuum cables	Kapton®	Feedthroughs	Various	–	–	–
Thermocouple wire and rod	Kapton® Types C, E, J, K, N, R, S & T	Thermocouples	3.2 to 6.4	–	–	350°C
Fibre optics	-	–	–	–	–	200°C

General specifications for insulator materials

Type	Material	Alumina content	Application	Conductor size	Number of pins	Voltage	Service temperature
Standoffs	Steatite	–	Miscellaneous	6-32" 8-32" 10-32" 1/4-20"	–	To 40kV-DC	To 450°C
Ceramic beads	Alumina	95%	Vacuum wire insulation	1.1 to 3.3	1	–	To 450°C
Spacers	Alumina	95%	Multi-pin	1.0 to 1.8 feedthroughs	4 to 35	–	To 450°C
Tools	Various						

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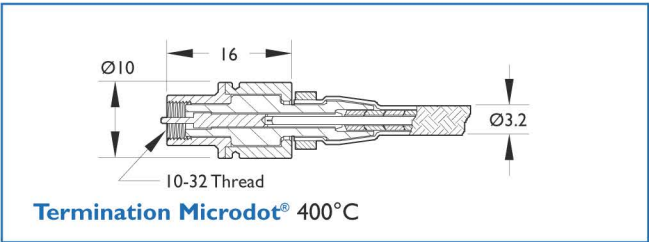
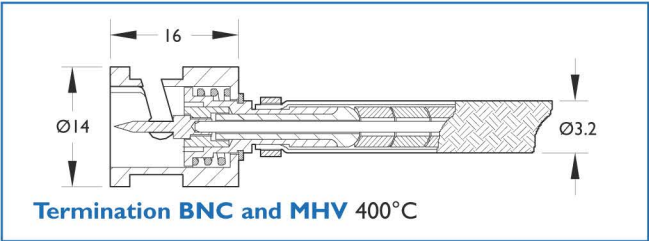
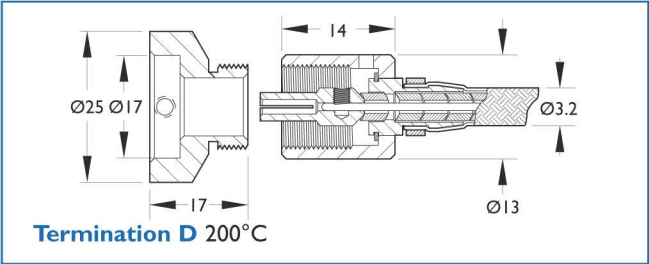
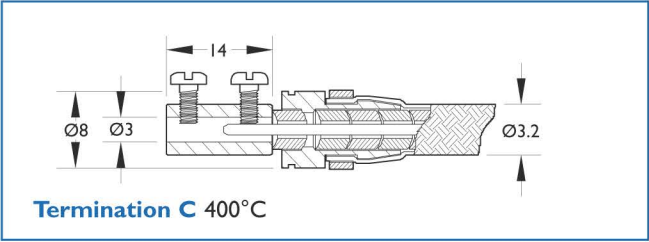
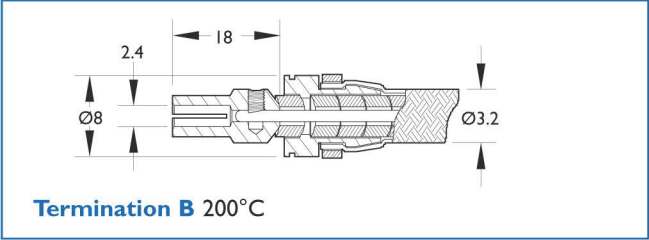
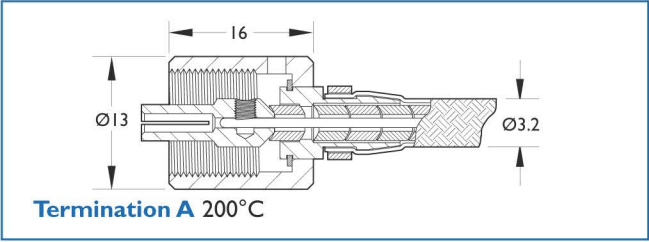
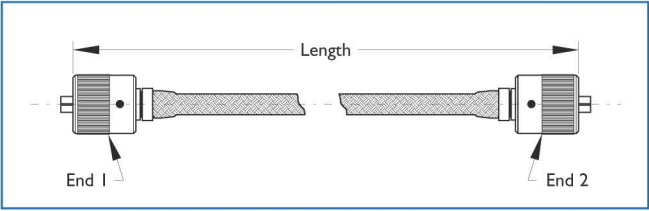


Connectors and cables

Vacuum ready coaxial cables



3.2 1/8" vacuum ready cable assemblies



Features

- Vacuum ready
- UHV-Compatible
- Bakeable as shown

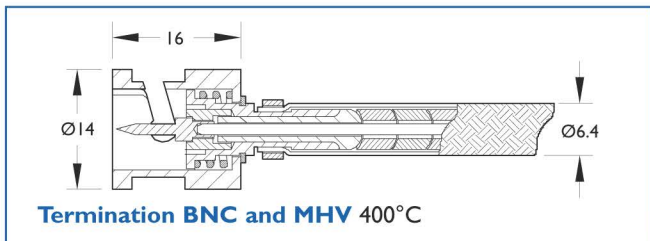
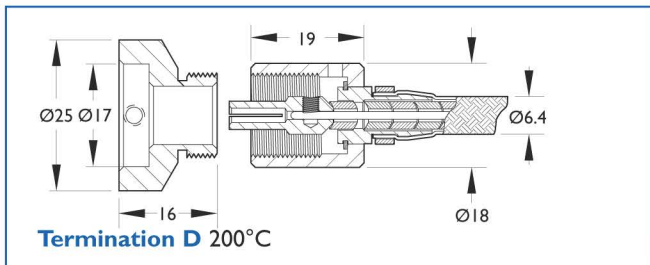
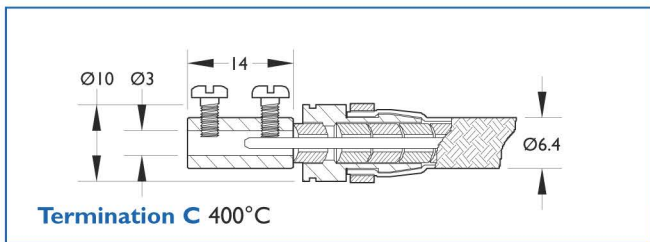
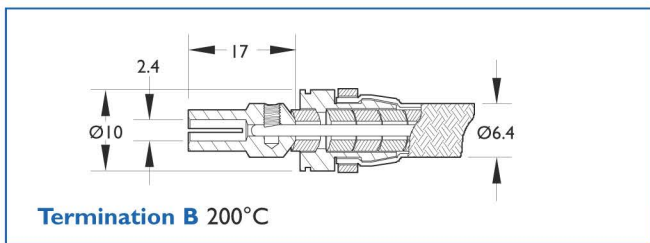
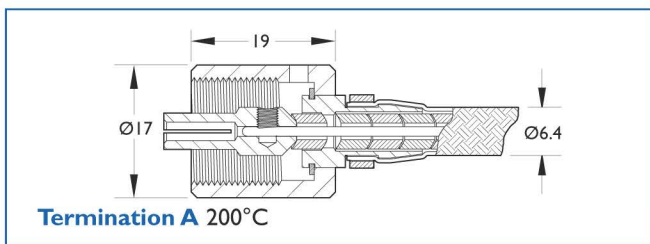
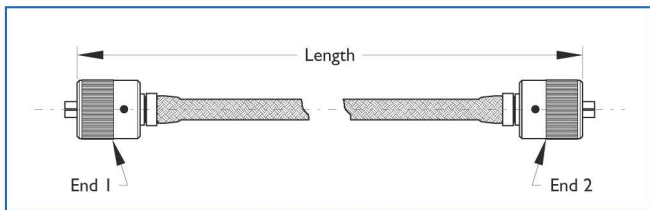
Length	Termination End 1	End 2	Reference	Part number
305	A	A	VRC8-AA-12	9931101
305	A	B	VRC8-AB-12	9931102
305	A	C	VRC8-AC-12	9931103
305	A	D	VRC8-AD-12	9931104
305	A	BNC	VRC8-ABNC-12	9931105
305	A	MHV	VRC8-AMHV-12	9931112
305	B	B	VRC8-BB-12	9931106
305	B	C	VRC8-BC-12	9931107
305	B	D	VRC8-BD-12	9931108
305	C	C	VRC8-CC-12	9931109
305	C	D	VRC8-CD-12	9931110
305	D	D	VRC8-DD-12	9931111
305	Microdot®	Microdot®	VRC8-MIMI-12	9931113
610	A	A	VRC8-AA-24	9931201
610	A	B	VRC8-AB-24	9931202
610	A	C	VRC8-AC-24	9931203
610	A	D	VRC8-AD-24	9931204
610	A	BNC	VRC8-ABNC-24	9931205
610	A	MHV	VRC8-AMHV-24	9931212
610	B	B	VRC8-BB-24	9931206
610	B	C	VRC8-BC-24	9931207
610	B	D	VRC8-BD-24	9931208
610	C	C	VRC8-CC-24	9931209
610	C	D	VRC8-CD-24	9931210
610	D	D	VRC8-DD-24	9931211
610	Microdot®	Microdot®	VRC8-MIMI-24	9931213
910	A	A	VRC8-AA-36	9931301
910	A	B	VRC8-AB-36	9931302
910	A	C	VRC8-AC-36	9931303
910	A	D	VRC8-AD-36	9931304
910	A	BNC	VRC8-ABNC-36	9931305
910	A	MHV	VRC8-AMHV-36	9931312
910	B	B	VRC8-BB-36	9931306
910	B	C	VRC8-BC-36	9931307
910	B	D	VRC8-BD-36	9931308
910	C	C	VRC8-CC-36	9931309
910	C	D	VRC8-CD-36	9931310
910	D	D	VRC8-DD-36	9931313
910	Microdot®	Microdot®	VRC8-MIMI-36	9931303

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

# Connectors and cables

Vacuum ready coaxial cables

## 6.4 1/4" vacuum ready cable assemblies



### Features

- Vacuum ready
- UHV-Compatible
- Bakeable as shown

Length	Termination End 1	End 2	Reference	Part number
305	A	A	VRC4-AA-12	<b>9932101</b>
305	A	B	VRC4-AB-12	<b>9932102</b>
305	A	C	VRC4-AC-12	<b>9932103</b>
305	A	D	VRC4-AD-12	<b>9932104</b>
305	A	BNC	VRC4-ABNC-12	<b>9932111</b>
305	A	MHV	VRC4-AMHV-12	<b>9932112</b>
305	B	B	VRC4-BB-12	<b>9932105</b>
305	B	C	VRC4-BC-12	<b>9932106</b>
305	B	D	VRC4-BD-12	<b>9932107</b>
305	C	C	VRC4-CC-12	<b>9932108</b>
305	C	D	VRC4-CD-12	<b>9932109</b>
305	D	D	VRC4-DD-12	<b>9932110</b>
305	BNC	BNC	VRC4-BNBN-12	<b>9932113</b>
305	MHV	MHV	VRC4-MHMH-12	<b>9932114</b>
610	A	A	VRC4-AA-24	<b>9932201</b>
610	A	B	VRC4-AB-24	<b>9932202</b>
610	A	C	VRC4-AC-24	<b>9932203</b>
610	A	D	VRC4-AD-24	<b>9932204</b>
610	A	BNC	VRC4-ABNC-24	<b>9932211</b>
610	A	MHV	VRC4-AMHV-24	<b>9932212</b>
610	B	B	VRC4-BB-24	<b>9932205</b>
610	B	C	VRC4-BC-24	<b>9932206</b>
610	B	D	VRC4-BD-24	<b>9932207</b>
610	C	C	VRC4-CC-24	<b>9932208</b>
610	C	D	VRC4-CD-24	<b>9932209</b>
610	D	D	VRC4-DD-24	<b>9932210</b>
610	BNC	BNC	VRC4-BNBN-24	<b>9932213</b>
610	MHV	MHV	VRC4-MHMH-24	<b>9932214</b>
910	A	A	VRC4-AA-36	<b>9932301</b>
910	A	B	VRC4-AB-36	<b>9932302</b>
910	A	C	VRC4-AC-36	<b>9932303</b>
910	A	D	VRC4-AD-36	<b>9932304</b>
910	A	BNC	VRC4-ABNC-36	<b>9932311</b>
910	A	MHV	VRC4-AMHV-36	<b>9932312</b>
910	B	B	VRC4-BB-36	<b>9932305</b>
910	B	C	VRC4-BC-36	<b>9932306</b>
910	B	D	VRC4-BD-36	<b>9932307</b>
910	C	C	VRC4-CC-36	<b>9932308</b>
910	C	D	VRC4-CD-36	<b>9932309</b>
910	D	D	VRC4-DD-36	<b>9932310</b>
910	BNC	BNC	VRC4-BNBN-36	<b>9932313</b>
910	MHV	MHV	VRC4-MHMH-36	<b>9932314</b>

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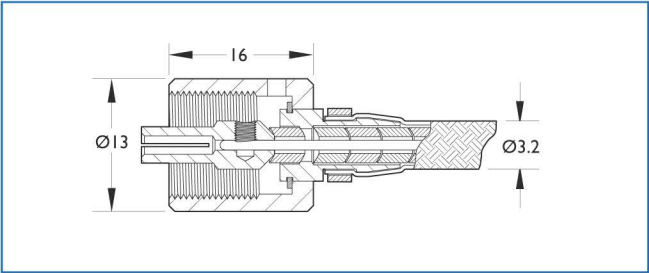


Connectors and cables

In-vacuum cable termination kits

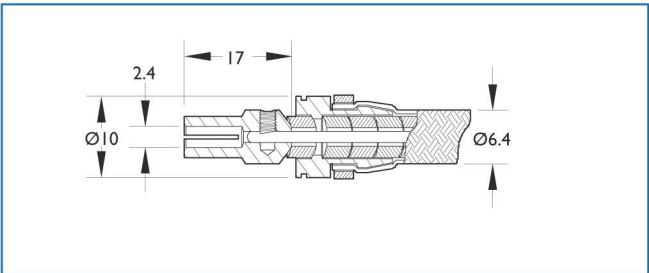


Type A 200°C



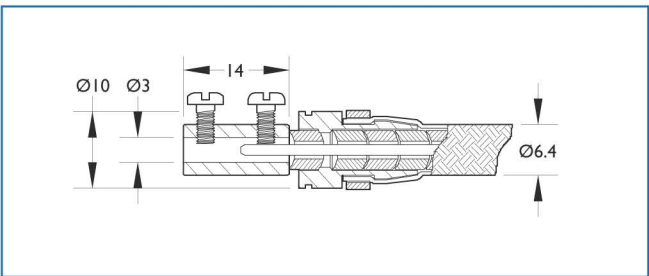
Reference	Part number
CXC-A8	9922100

Type B 200°C



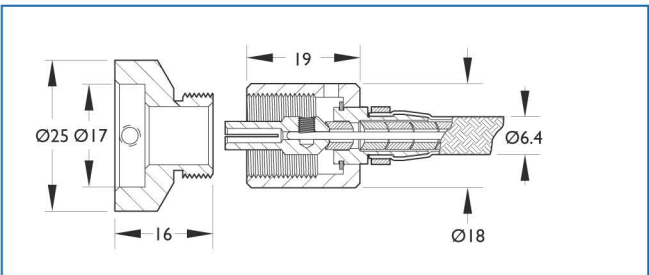
Reference	Part number
CXC-B8	9922110

Type C 200°C



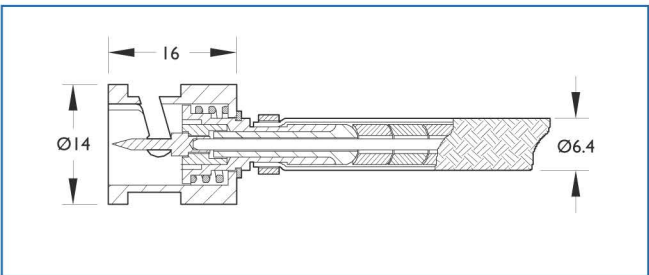
Reference	Part number
CXC-C8	9922120

Type D 200°C



Reference	Part number
CXC-D8	9922130

BNC and MHV 400°C



Reference	Reference	Part number
BNC	CXC-BNC8	9922140
MHV	CXC-MHV8	9922150

Connectors and cables

Insulators and spacers



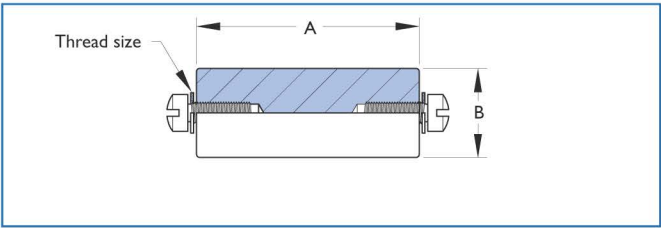
Ceramic stand-offs Steatite

Stand-offs



Features

- UHV-compatible
- Supplied with UNF screws



DC (kV) Air	DC (kV) Vacuum	UNF Thread size	A	B	Reference	Part number
3	7	6-32	10	10	CSS1	9951200
4	10	6-32	13	10	CSS2	9951201
5	12	8-32	16	13	CSS3	9951202
6	15	8-32	19	10	CSS4	9951203
8	20	6-32	25	10	CSS5	9951204
8	20	8-32	25	13	CSS6	9951205
8	20	10-32	25	19	CSS7	9951206
10	25	¼"-20	32	25	CSS8	9951207
14	35	8-32	51	13	CSS9	9951208
14	35	10-32	51	19	CSS10	9951209
16	40	¼"-20	64	25	CSS11	9951210

Ceramic beads

Beads



Features

- UHV-compatible
- Price is for 300mm length
- High-purity alumina 95% Al<sub>2</sub>O<sub>3</sub>

Bead length	Outside diameter	Beads per length	Inside diameter	Accepts wire dia.	Reference	Part number
2.8	2.5	125	1.3	1.1	CB045	9951000
4.7	4.6	85	2.2	1.6	CB064	9951001
4.3	4.0	73	1.7	1.3	CB050	9951002
6.6	6.1	56	2.7	2.6	CB102	9951003
6.6	6.1	53	3.7	3.3	CB128	9951004
10.2	9.3	38	3.7	3.3	CBL128	9951005

Ceramic spacers 4 to 35 pins

Spacers



Features

- UHV-compatible
- High-purity alumina 95% Al<sub>2</sub>O<sub>3</sub>

Pins	Diameter	Thick	Hole	Reference	Part number
4 and 10	16	3.4	1.8	CS410-2	9951100
6	16	3.4	1.8	CS6-2	9951101
10	16	3.4	1.0	CS10-1	9951102
20	32	3.2	1.0	CS20-1	9951103
20	32	3.2	1.8	CS20-2	9951104
35	43	3.2	1.8	CS35-2	9951105
35	35	3.2	1.8	CS35-2/35	9951106

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



Connectors and cables

Tools and safety equipment

Description

Caburn-MDC offers a variety of tools suitable for use with some or all of the products in this section.

Crimping Pliers

These pliers are ideal for use in the fabrication of 3.2mm coaxial vacuum cables. They are used to crimp the aluminium retainers which fasten coaxial shielding to cable terminations.

All materials required for building your own coaxial cable assembly are available in this catalogue. Cable termination kits, stainless steel braiding, Glidcop® copper wire and fish-spine alumina ceramic insulator beads are detailed on the previous pages.

Spline Wrench

These wrenches are for use with No. 4 six spline socket set screws as those used on power push-on connectors. They are made of hardened steel and sold in packages of ten.

High Voltage Protective Cover

Caburn-MDC Protective Covers are designed to clamp on to the outside diameter of a standard flanged DN40 CF feedthrough. This device provides both safety and convenience: exposed high voltage conductors can be contained and wire connectors fed into a cable which attaches to the back of the acrylic cover.

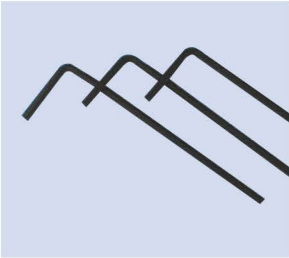
Tools and safety equipment

Crimping pliers



Description	Reference	Part number
Use with 3.2 (1/8") cable termination kit	CP8	9991000
Use with 6.4 (1/4") cable termination kit	CP4	9991001

Spline wrench

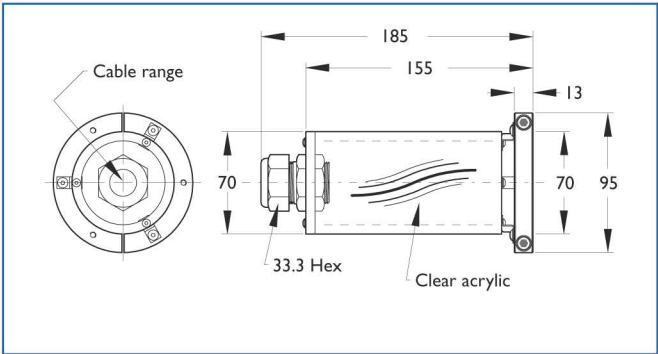


Features

- For use with power push-ons

Description	Reference	Part number
10 per pack number 4 six spline	SPW	9991100

High voltage protective cover



Cable range	Reference	Part number
3.8 – 8.1	HVE-1	640050
5.8 – 11.9	HVE-2	640051
8.9 – 16.0	HVE-3	640052
13.0 – 18.0	HVE-4	640053

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Connectors and cables

Tools and safety equipment



UHV Colour identification beads

KAPWI-6

Cable type	Bead ID	Bead length	Maximum wire diameter	Reference	Part number
All	I	2.3	0.89	KAPWI-6	1510200

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

Wire strippers

KAPSI and KAPS2

Cable type	Conductor		Reference	Part number
	Minimum	Maximum		
All	0.12	0.40	KAPSI	1512050
All	0.25	0.80	KAPS2	1512051

Ideally suited for Kapton® insulation stripping.

UHV Conductive glue

UHVGLUE -H21D and -H27D

Glue type	Maximum temperature	Reference	Part number
Conductive	150°C	UHVGLUE-H21D	1260217
Conductive	270°C	UHVGLUE-H27D	1260218

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

Important

Hardening times	HD21	5 mins at 150°C or 12 hrs at 50°C
	HD27	1 hr at 150°C

Shelf life See pack

Resistivity 0.1 to 0.3mΩcm

Crimping tools

DC-POS I

Accessory type	Reference	Part number
Crimping tool for male/female contacts (DPINMC + DPINFC)	DCTI	1512056
HV/Air crimping tool for male/female contacts (DPIN-MPOS + DPIN-FPOS)	DCT-POS I	1510115

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





# Connectors and cables

## Introduction

General specifications			
Type	Specifications		Temperature range
<div>Miniature TC</div> <div></div>	<div>Voltage rating</div> <div>Current rating</div>	<div>mV</div> <div>mA</div>	+20°C to 125°C
<div>PowerBoot®</div> <div></div>	<div>Voltage rating</div> <div>Current rating</div>	<div>5,000V or 20,000V</div> <div>to 25A</div>	-20°C to 150°C
<div>EAG-4</div> <div></div>	<div>Impedance</div> <div>Frequency range</div> <div>Voltage rating</div> <div>Dielectric withstanding voltage</div>	<div>50Ω Nominal</div> <div>0-11GHz with flexible cable</div> <div>1,500V Peak</div> <div>2,500V RMS TFE insulator</div>	200°C
<div>Crimp connector</div> <div></div>	<div>Impedance</div> <div>Frequency range</div> <div>Voltage rating</div> <div>Dielectric withstanding voltage</div>	<div>50Ω Nominal</div> <div>0-12.4GHz with flexible cable</div> <div>500V Peak</div> <div>1,000V RMS with RG58 group</div>	200°C
<div>TC Screw and nut sets</div> <div></div>	Slotted screw with hex nut		to 450°C
<div>TC Crimp push</div> <div></div>	Chromel®, Alumel®, Iron, Constantan J, Constantan E&T and Nickel-200		to 350°C
<div>Power crimp</div> <div></div>	BeCu		<div>to 150°C Air</div> <div>to 200°C Vacuum</div>

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



General specifications

Type	Specifications	Temperature range
<div>Power push-on</div> <div></div>	BeCu	to 150°C Air to 200°C Vacuum
<div>Power in-line</div> <div></div>	BeCu	to 150°C Air to 200°C Vacuum
<div>In-line clamp connectors</div> <div></div>	Copper	
<div>Right-angle connectors</div> <div></div>	Copper	
<div>Sub-D</div>	Male and female contacts Ni-Fe alloy, gold plated	to 250°C

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



Section 6.8

# Connectors and cables

Circular connectors – 3 to 7 pins

Feedthroughs – electrical and optical

To 500V – to 3.5A – air service to 65° C

## CON-C3



## CON-C5



## Description

Three, five and seven pin circular connectors are not industry standard connectors. These connectors have been developed by Caburn-MDC for applications requiring moderate pin density while maintaining relatively small package size. They are screw type connectors which offer the dependability of a threaded coupling. Standard dielectric material for these circular connectors is PVC. They are fitted with female socket receptacles that mate with 0.81mm diameter pins.

### CA

Connector attached measures the distance between the flange face of the feedthrough and the end of the attached connector.

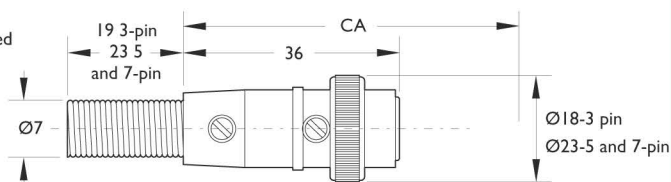


Figure 1

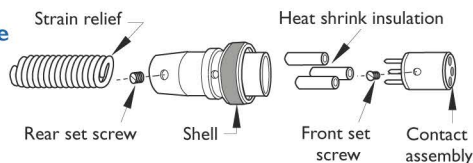


Figure 2

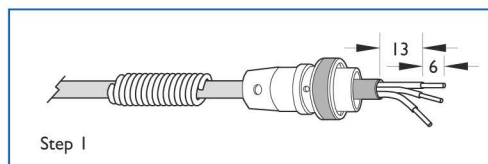


Figure 3

### Parts nomenclature

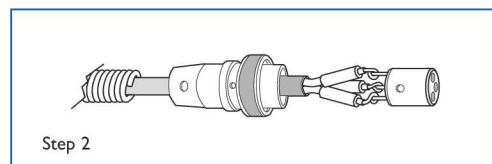


## Wiring instructions



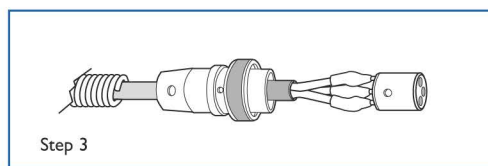
Step 1

**Step 1** Slide strain relief spring and shell over cable. Strip cable and individual conductors as detailed. Wet conductor with 60 – 40 tin lead solder.



Step 2

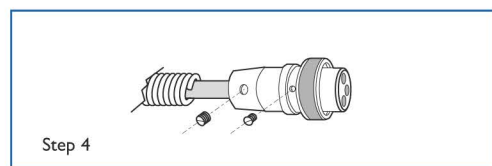
**Step 2** Slide heat shrink<sup>1</sup> insulation over each conductor. Coil each conductor to fit over contacts. Solder in place using 60 – 40 tin lead solder. Contacts on five and seven pins should be bent inward slightly to allow fitting of coiled conductors. If conductors are not suitable for coiling use a straight lap with adequate solder.



Step 3

**Step 3** Slide the heat shrink<sup>1</sup> cable insulation over each solder joint covering all exposed metal. Heat and shrink insulation at approximately 135°C.

<sup>1</sup> Not required with five and seven pin connector



Step 4

**Step 4** Slide shell over contact assembly. Align shell and contact assembly holes and fasten front set screw. (Note that set screws are actually on opposite sides of shell but are shown in drawing on the same side for clarity.) Slide strain relief into shell and fasten rear set screw. Five and seven pin connectors use a threaded adaptor to fasten strain relief.

Description	Volts	Amps	Number of pins	Figure	Reference	Part number
Circular connector	500	3.5	3	1	CON-C3	9921000
Circular connector	500	3.5	5	2	CON-C5	9921001
Circular connector	500	3.5	7	3	CON-C7	9921002

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 www.mdcvacuum.eu



Connectors and cables

Circular MS connectors – 2 to 35 pins

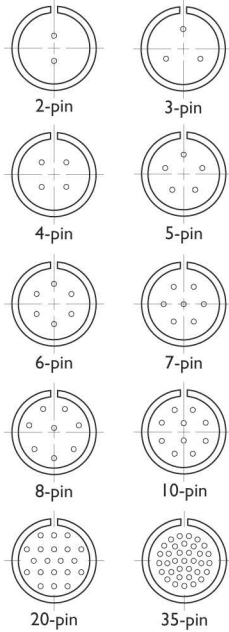
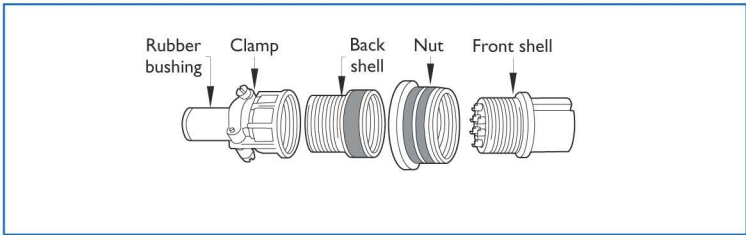
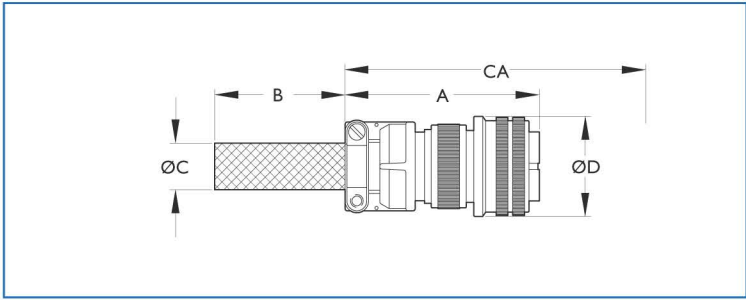


To 1,750V – to 23A – air service to 125°C

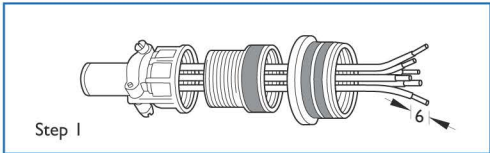


**Description**

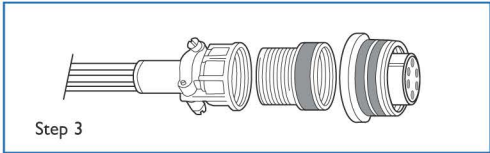
The MS prefix in a connector reference number indicates an approved status under the current military specification MIL-C-5015. MS-3106A are solid-shell straight plug threaded connectors with polarizing keyways; all are female socket type suitable for connecting with male pin type receptacles. Standard dielectric materials for these MS connectors is Diallyl Phthalate; this resin is dimensionally stable, has high arc resistance and high insulation resistance under both humidity and thermal stress. Contacts are silver plated and have pre-tinned solder pockets.



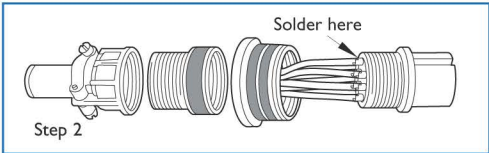
Wiring instructions



**Step 1** Slide the cable clamp, rubber bushing, back shell and nut (in that order) over cable, then strip each conductor 6mm as detailed.



**Step 3** Slide nut over front shell, then thread back shell on to front shell and tighten. Slide rubber bushing into clamp, then thread the clamp on to back shell and tighten. Moderately tighten clamp screws to provide adequate strain relief to wire and contact solder joints.



**Step 2** Insert each conductor in the corresponding contact solder cup (note that contacts are identified in a clockwise pattern by alphabetical markings on insulator) then solder in place using a non acid core 60 – 40 tin lead solder.

Description	MS Number	Volts	Amps	Number of pins	Pin size	A	B	C	D	Reference	Part number
MS Connector	MS-3106A-16-11S	700	23	2	2.29	61	48	11	32	CON-MS2	9921008
MS Connector	MS-3106A-22-9S	1750	23	3	2.29	69	41	16	41	CON-MS3	9921009
MS Connector	MS-3106A-20-4S	1250	23	4	2.29	69	41	16	37	CON-MS4	9921010
MS Connector	MS-3106A-18-4S	1250	13	4	1.52	66	43	14	34	CON-MS4B	9921005
MS Connector	MS-3106A-18-11S	700	23	5	2.29	66	43	14	34	CON-MS5	9921011
MS Connector	MS-3106A-18-12S	700	13	6	1.52	66	43	14	34	CON-MS6	9921006
MS Connector	MS-3106A-18-15S	700	23	7	2.29	69	41	16	37	CON-MS7	9921012
MS Connector	MS-3106A-24-6S	700	23	8	2.29	74	36	19	44	CON-MS8	9921013
MS Connector	MS-3106A-18-1S	700	13	10	1.52	66	46	14	34	CON-MS10	9921003
MS Connector	MS-3106A-28-16S	700	13	20	1.52	74	36	19	50	CON-MS20	9921004
MS Connector	MS-3106A-36-15S	700	13	35	1.52	76	33	32	63	CON-MS35	9921014





# Connectors and cables

Circular MS connectors – 4 to 35 pins

To 700V – to 10A – air and vacuum service to 350°C

## CON23-IV10



### Description

Although these connectors do not carry the MS prefix, they are of the MS type. Other than the alumina ceramic dielectric, these connectors meet standard specifications for MIL-C-5015 connectors. They are solid shell straight plug threaded connectors with polarizing keyways. The female socket contacts are Alumel®, a high nickel alloy suitable for service in air or vacuum and bakeable to 350°C. The metal shell components are nickel plated aluminium with low vapour pressure characteristics, unlike standard MS circular connectors which are cadmium plated and not suitable for UHV.

### CA

Connector attached measures the distance between the flange face of the feedthrough and the end of the attached connector.

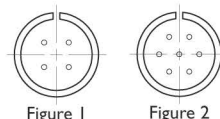
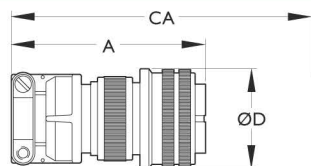


Figure 1

Figure 2

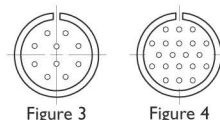


Figure 3

Figure 4

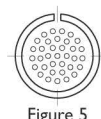
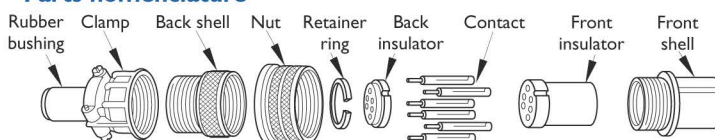
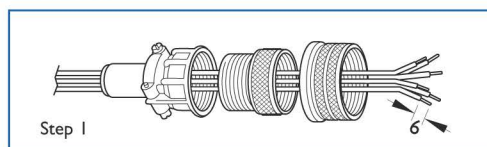


Figure 5

### Parts nomenclature

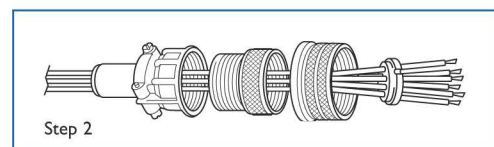


### Wiring instructions



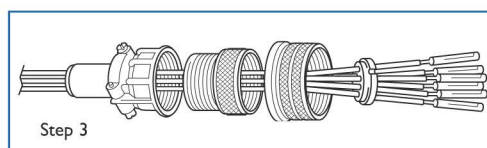
Step 1

**Step 1** Slide the cable clamp, back shell and nut (in that order) over cable, then strip each conductor 6mm as detailed.



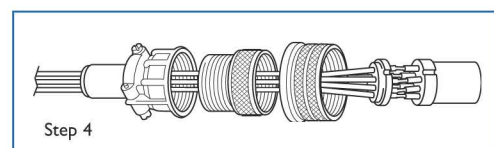
Step 2

**Step 2** Remove retainer ring from front shell and disassemble by sliding insulators and contacts. Note that insulator consists of front and back pieces. Insert wires through the appropriate sides in back insulator before crimping contacts.



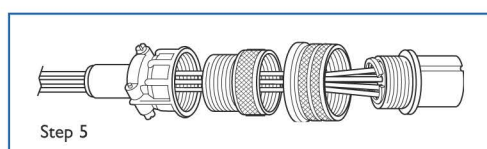
Step 3

**Step 3** Slide contacts on to wire and crimp in place.



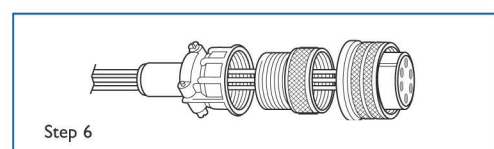
Step 4

**Step 4** Insert crimped contacts into appropriate holes in front insulator. Note alignment slots on insulators.



Step 5

**Step 5** Slide the front and back insulators together and insert them into the front shell. Secure them in place with the retainer ring.



Step 6

**Step 6** Slide the nut over the front shell, then thread the back shell on to the front shell and tighten. Thread the clamp on to the back shell and tighten. Moderately tighten clamp screws to provide adequate strain relief to wire and contacts.

Description	Volts	Amps	Number of pins	Pin size	Figure	A	B	Reference	Part number
MS Connector	700	10	4	1.42	1	66	34	CON-IV4	9921015
MS Connector	700	10	6	1.42	2	66	34	CON-IV6	9921016
MS Connector	700	10	10	1.42	3	66	34	CON-IV10	9921017
MS Connector	700	10	20	1.42	4	74	50	CON-IV20	9921018
MS Connector	700	10	35	1.42	5	76	63	CON-IV35	9921019

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

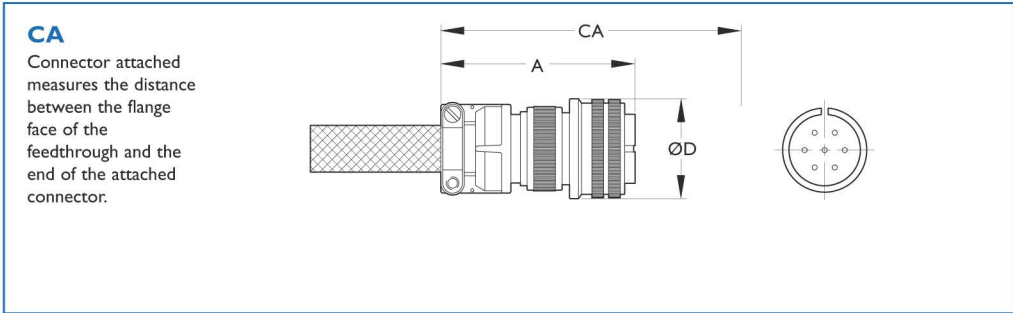
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Connectors and cables

Circular MS connectors – 7 pins / 12 kV



12,000V – 17.5A – air service to 125° C



Description

High voltage MS style circular connectors are designed for use with Caburn-MDC's 12kV multi-pin feedthroughs.

Connector shell components are constructed of 6016-T6 aluminium alloy and are electroless nickel plated per MIL-C-26074.

High-voltage insulation is provided by a single piece, molded silicone rubber insert per ZZ-R-765.

Female socket contacts are made of commercial bronze and gold plated per MIL-C-4520.

To insure proper electrical performance the connector wiring instructions must be strictly adhered to.

Wiring instructions

The instructions presented herein must be used in conjunction with connector wiring document number 987001 supplied with each connector. If you would like to receive a copy of this document before purchasing a connector, please contact technical sales.

**Step 1** Grit blast or abrade the ID of shell (back end only), backshell and the entire OD of snap ring, using a medium grit sand media. Mask off as required and clean with acetone after grit blasting.

**Step 2** Prime ID of shell (back end only) with primer (A) and ID of backshell and entire snap ring with primer (B).

**Step 3** Lightly abrade large OD and back end of insulator using medium grit emery cloth. Clean with acetone.

**Step 4** Apply thin smooth layer of adhesive to large OD of insulator. Align with keyway and slide into shell until it bottoms out. Wipe any excess adhesive with a cotton swab. Insert snap ring behind insulator and check insulator depth as detailed. Let adhesive cure for a minimum of 12 hours before proceeding to step 5.

**Step 5** Lightly abrade back end of insulator and wire insulation approximately 1 inch from the end, using medium grit emery cloth. Wipe clean with isopropyl alcohol or acetone.

**Step 6** Strip insulation on each conductor 3/16" to 1/4" from ends, being careful not to nick or cut conductor strands.

**Step 7** Crimp socket contacts to exposed conductors, using specified crimp tool. Crimp tool should be set to .040" closure diameter as required for #20-AWG wires.

**Step 8** Thoroughly clean wires and contacts with isopropyl alcohol or acetone.

**Step 9** Prime back end of contacts using primer (A) and let dry for a minimum of 1 hour before applying adhesive.

**Step 10** Apply thin smooth layer of adhesive to the same areas primed in step 9 and approximately 1/4" of the wire insulation. Push crimped contacts and wires into back end of insulator, using a twisting motion, until contacts "POP" into place. Let adhesive cure for a minimum of 12 hours.

**Step 11** Thread backshell onto shell until it bottoms out. Hand tighten.

**Step 12** Pot the back end of shell assembly using the specified potting compound. Cure for at least 12 hours @ 50% RH minimum before handling and 24 hours before testing.

**Step 13** Thread cable strain relief and clamp to cable as required.

Description	Volts	Amps	Number of pins	Pin size	A	B	Reference	Part number
Circular connector	12kV	7.5	7	1.27	59	29	CON-CC7	9921020





Connectors and cables

Circular – BNC

Air service to 165° C

CON-BNC

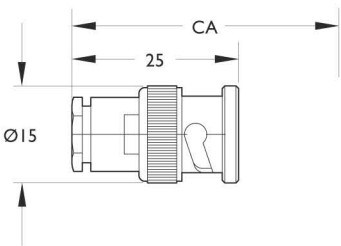


Description

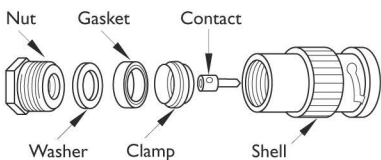
Bayonet naval connectors, BNCs are the world's most popular 50Ω RF connectors. BNC connectors are miniature, light-weight units designed to operate satisfactorily up to 11GHz. These connectors typically yield low reflection up to 4GHz on 5Ω cables. Their quick disconnect bayonet coupling is a key feature.

CA

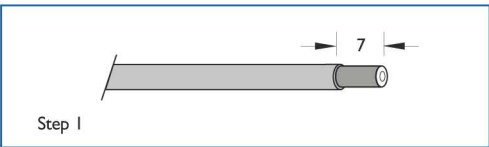
Connector attached measures the distance between the flange face of the feedthrough and the end of the attached connector.



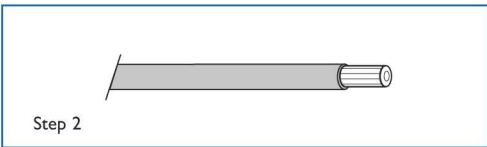
Parts nomenclature



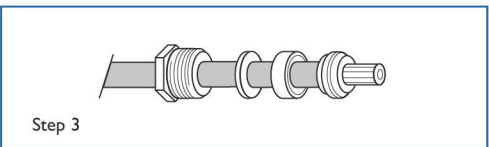
Wiring instructions



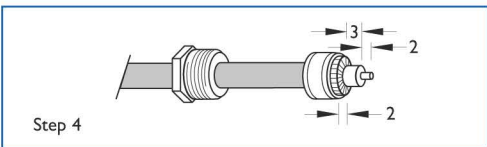
**Step 1** Cut and strip jacket to 7mm as shown.



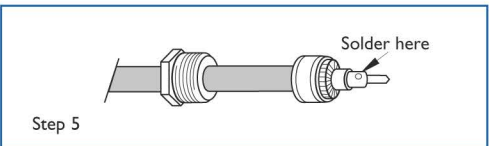
**Step 2** Comb out braid and taper toward conductor.



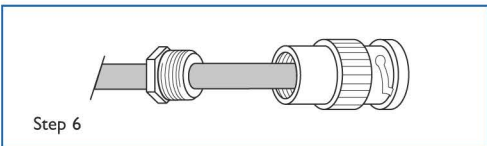
**Step 3** Slide nut, washer and gasket over cable, then slide the clamp over the braid so that its inner shoulder bottoms out against cable jacket end.



**Step 4** With clamp in place, comb braid back over clamp and trim to 2mm from the end. Trim dielectric to 3mm leaving an exposed conductor length of 2mm. Do not nick conductor. Wet conductor using a non acid core 60 - 40 tin lead solder.



**Step 5** Slide contact pin on to conductor until it butts with dielectric, solder in place using a 60 - 40 tin lead solder. Be sure to remove excess solder. Do not overheat cable dielectric as swelling may prevent insertion of cable into shell.



**Step 6** Slide cable into shell as far as it will go. Then slide nut into shell and screw in place with wrench until tight. Make sure to hold cable and shell rigid while rotating nut.

Description	MS number	Volts	Use cable	Reference	Part number
Coaxial – BNC Connector	UG-88U	5000	RG58B/U	CON-BNC	9922000

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

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Connectors and cables

Coaxial – MHV



Air service to 165° C

CON-MHV

**CA**

Connector attached measures the distance between the flange face of the feedthrough and the end of the attached connector.

**Description**

Miniature high-voltage, (MHV) connectors are also known as high voltage BNCs but do not inter-mate with BNC connectors. They are designed for applications which must withstand a pulsed signal up to 5000V peak. MHV connectors operate to 50MHz with a non-constant impedance structure.

**Parts nomenclature**

Wiring instructions

Step 1

**Step 1** Slide nut, washer and gasket (with V groove toward cable end) over cable jacket. Cut and strip cable jacket to 15mm as shown.

Step 2

**Step 2** Comb out braid and taper toward conductor.

Step 3

**Step 3** Slide clamp over braid (small end toward cable end) and push back against cable jacket. Fold braid wires back over clamp and trim flush at large end of clamp. Cut dielectric exposing 3mm conductor length as shown. Do not nick conductor. Wet exposed conductor using a non acid core 60 – 40 tin lead solder; do not overheat.

Step 4

**Step 4** Slide contact on to conductor and solder in place using 60 – 40 tin lead solder. Remove excess solder. Do not overheat cable dielectric as swelling may prevent cable insertion into shell.

Step 5

**Step 5** Slide cable assembly into shell as far as it will go. Then slide nut into shell and screw in place with wrench until tight. Make sure to hold cable and shell rigid while rotating nut.

Description	MS number	Volts	Use cable	Reference	Part number
Coaxial – BNC Connector	UG-88U	5000	RG58B/U	CON-MHV	9922001





Section 6.8

# Connectors and cables

Coaxial – SHV-5

Feedthroughs – electrical and optical

Air service to 165° C

## CON-SHV-5

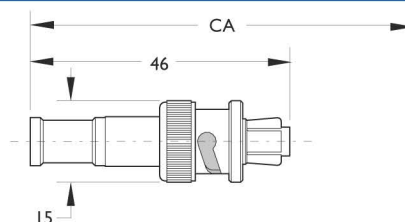


### Description

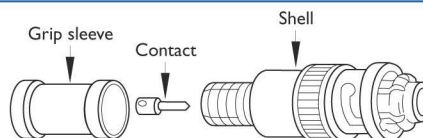
Safe high voltage 5kV connectors feature improved interface over the MHV series connectors. The SHV-5 outer contact ground connection is maintained through the entire centre contact mating cycle. The centre contacts are recessed to prevent shock hazards when the connectors are unmated.

### CA

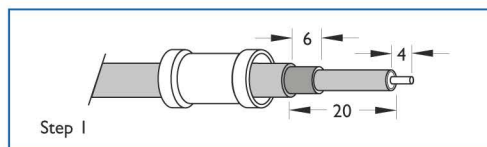
Connector attached measures the distance between the flange face of the feedthrough and the end of the attached connector.



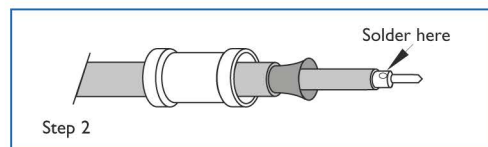
### Parts nomenclature



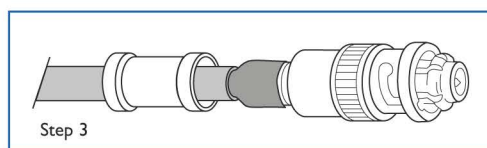
### Wiring instructions



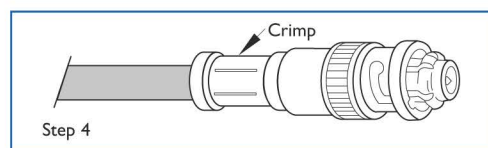
**Step 1** Slide grip sleeve over cable jacket. Cut and strip cable jacket, braided shield and dielectric to dimensions shown. Do not nick conductor.



**Step 2** Wet exposed conductor using a non acid core 60 – 40 tin lead solder; then slide contact on conductor and solder in place. Do not over heat cable dielectric, as swelling may prevent insertion of cable into shell. Flare braid as shown without fraying.



**Step 3** Slide cable assembly into shell as far as it will go. At this stage the shell grip fingers should be under the flared braid as shown.



**Step 4** Slide grip sleeve forward over braid and bottom out against shell; crimp in place using Kings crimp tool number KTH-1000 and crimp die number KTH-2062.

Description	MS number	Volts	Use cable	Reference	Part number
Coaxial – SHV-5	UG-932U	5000	RG59B/U	CON-SHV-5	9922002

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

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Connectors and cables

Coaxial – Type-N



Air service to 165° C

CON-N

CA

Connector attached measures the distance between the flange face of the feedthrough and the end of the attached connector.

**Description**

Type-N connectors are medium size, weatherproof, threaded coupling units designed for use from DC to 11 GHz. VSWR is consistently low across this broad frequency range. They are impedance matched to 50Ω cables.

Parts nomenclature

Wiring instructions

Step 1

**Step 1** Slide nut, gasket (with V groove toward cable end) over cable jacket as shown. Cut and strip cable jacket to 7mm length as shown.

Step 2

**Step 2** Comb out braid and fan out radially. Cut and strip dielectric to expose 4mm conductor length. Do not nick conductor.

Step 3

**Step 3** Pull braid forward and taper toward conductor then slide clamp over braid (tapered end first) and bottom out against cable jacket.

Step 4

**Step 4** Fold braid back over clamp and trim to 3mm length. Wet conductor using a non acid core 60 – 40 tin lead solder, then slide contact on and solder in place. Do not overheat cable dielectric as swelling may prevent insertion of cable into shell.

Step 5

**Step 5** With gasket properly seated on clamp, slide cable assembly into shell as far as it will go. Slide nut into shell and screw in place with wrench until tight. Make sure to hold cable and shell rigid while rotating nut.

Description	MS number	Volts	Use cable	Reference	Part number
Coaxial – Type-N Connector	UG-21D/U	1500	RG214/U	CON-N	9922003



# Connectors and cables

Coaxial – SMA

Air service to 165° C

## CON-SMA

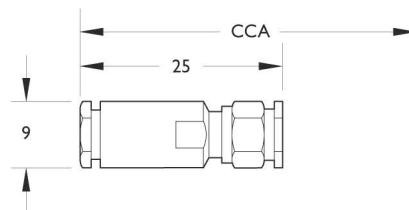


### Description

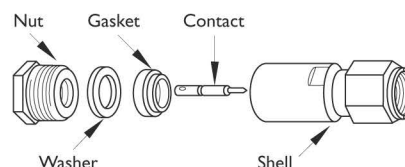
SMA connectors are semi-precision, subminiature, high frequency connectors which offer reliable broadband performance DC to 12.4 GHz with low reflection and constant 50Ω impedance.

### CA

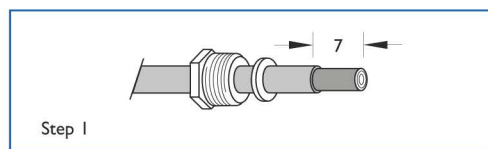
Connector attached measures the distance between the flange face of the feedthrough and the end of the attached connector.



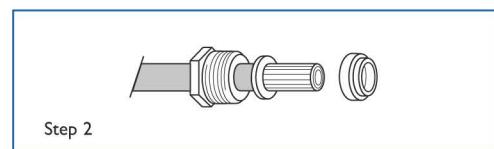
### Parts nomenclature



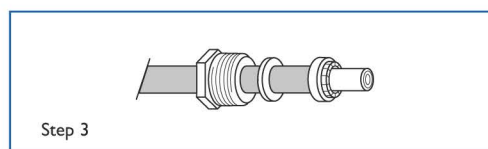
### Wiring instructions



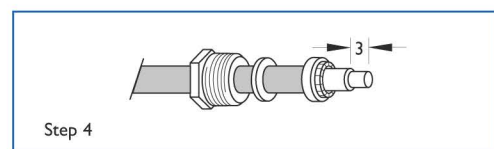
**Step 1** Slide nut and gasket over cable jacket as shown. Cut and strip jacket exposing braid by 7mm length.



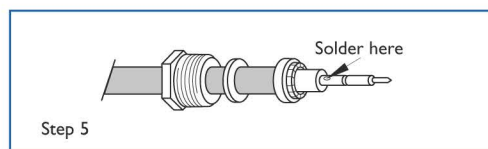
**Step 2** Comb out braid and taper forward towards conductor. Then slide clamp over braid until it bottoms out on cable jacket.



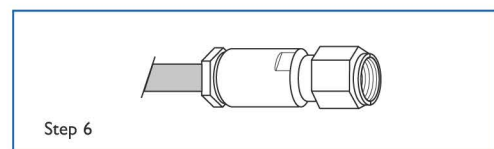
**Step 3** Fold braid wire back over clamp and trim as necessary so that they are clear of clamp shoulder.



**Step 4** Cut and trim dielectric exposing conductor to 3mm length. Do not nick conductor. Wet conductor using a non acid core 60 – 40 tin lead solder. Do not overheat.



**Step 5** Slide contact on to conductor and solder in place holding squarely against dielectric. Remove excess solder. Do not overheat cable dielectric as swelling may prevent insertion of cable into shell.



**Step 6** Slide cable assembly into shell as far as it will go. Slide nut into shell and screw in place with wrench until tight. Hold cable and shell rigid while rotating nut.

Description	Volts	Use cable	Reference	Part number
Coaxial – SMA Connector	700	RG58B/U	CON-SMA	9922004

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

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Connectors and cables

Coaxial – SMB



Air service to 165° C



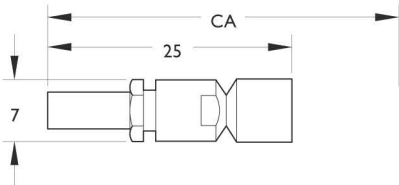
CON-SMB

Description

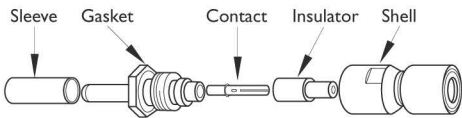
SMB connectors feature quick connect and disconnect snap-on mating and are suitable for 50Ω impedance structures.

CA

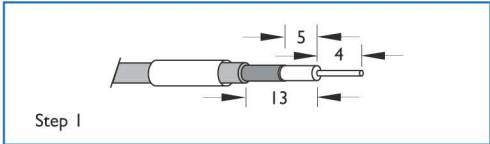
Connector attached measures the distance between the flange face of the feedthrough and the end of the attached connector.



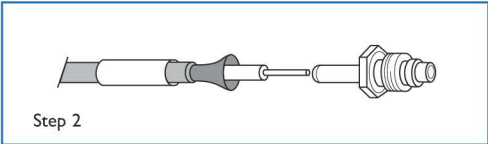
Parts nomenclature



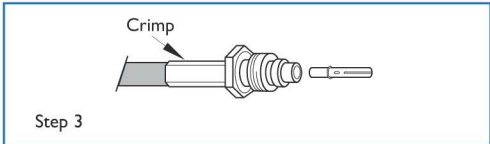
Wiring instructions



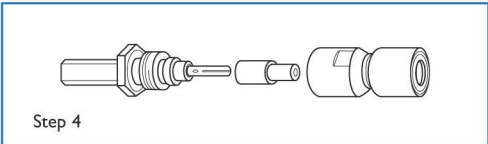
**Step 1** Slide grip sleeve over cable jacket. Cut and strip cable jacket, braid and dielectric to dimensions shown. Make all cuts sharp and square. Do not nick braid, dielectric or centre conductor. Wet conductor using a non acid core 60 – 40 tin lead solder. Do not overheat.



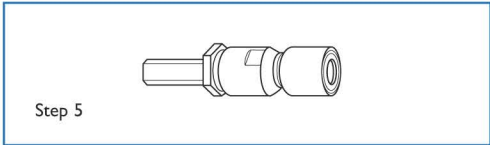
**Step 2** Slightly flare braid as shown. Do not fray. Slide nut on to cable so that stem slides under braid. Push until dielectric bottoms out inside nut.



**Step 3** Slide grip sleeve forward over braid and butt against nut. Remove all slack in braid. Crimp grip sleeve with crimp tool while keeping cable dielectric bottomed out inside nut. Slide contact onto pre wetted conductor and solder in place using non acid flux. Do not get solder on outside surface of contact.



**Step 4** Slide insulator over contact then slide cable assembly into shell. Screw together using wrench, hold cable assembly stationary while rotating shell.



Description	Volts	Use cable	Reference	Part number
Coaxial – SMB Connector	500	RG17A/U	CON-SMB	9922007

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





# Section 6.1

## Connectors and cables

### Coaxial – SHV-B

Feedthroughs – electrical and optical

Air service to 300° C

#### CON-SHV-B

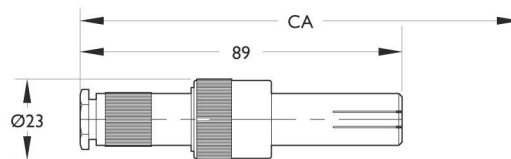


#### Description

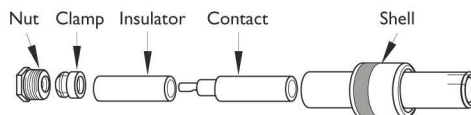
Safe high voltage 7.5kV bakeable connector. These connectors are not industry standard coaxial connections, but developed to meet the demands of process temperatures as high as 300°C. The difference between SHV-B and conventional connectors is the use of alumina ceramic dielectric and crimp style contact connections.

#### CA

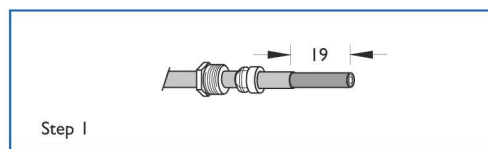
Connector attached measures the distance between the flange face of the feedthrough and the end of the attached connector.



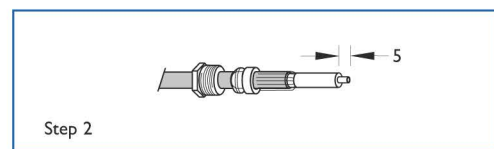
#### Parts nomenclature



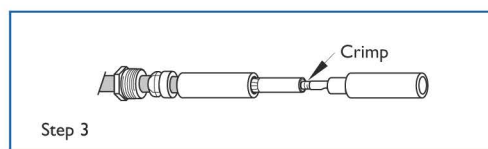
#### Wiring instructions



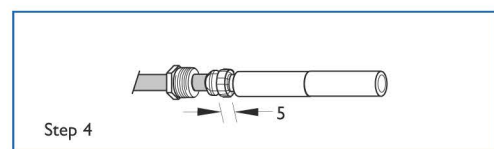
**Step 1** Slide nut and clamp over cable jacket. Cut and strip jacket exposing 19mm braid length. Do not nick braid.



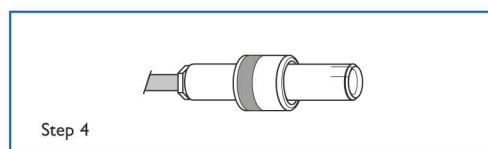
**Step 2** Comb out braid and fold back over cable jacket. Cut and strip dielectric exposing 5mm conductor length. Do not nick conductor.



**Step 3** slide insulator over cable until braid is covered. Slide contact on to conductor and crimp in place as shown. Do not solder.



**Step 4** Slide insulator forward over crimp joint and butt against contact assembly. Fold braid out and slide clamp forward to meet braid and butt against insulator. Form braid around clamp and trim to 5mm length as shown.



**Step 5** Slide cable assembly and nut into shell and moderately tighten nut with wrench. Hold shell and cable stationary while rotating nut.

Description	Volts	Use cable	Reference	Part number
Coaxial – SHV-B Connector	7500	RG159B/U	CON-SHV-B	9922005

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

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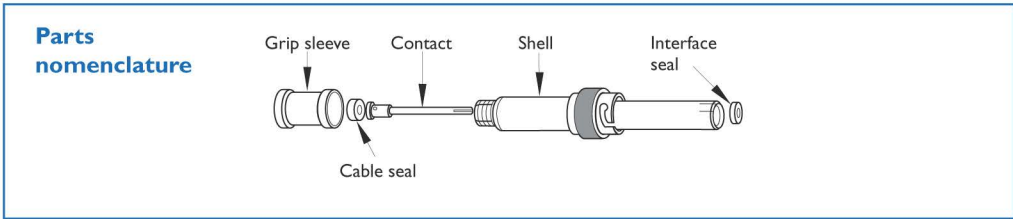
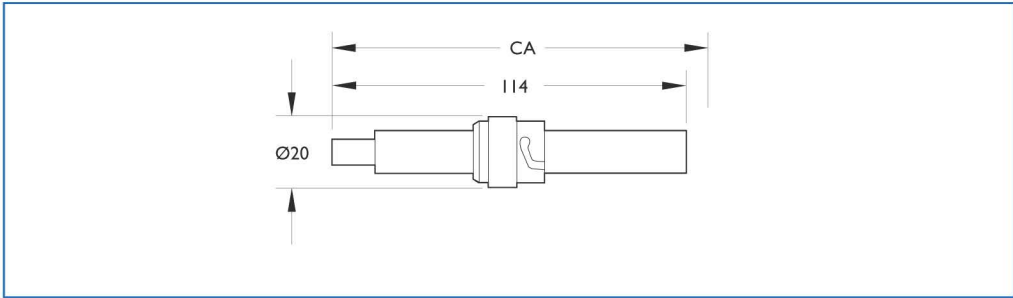
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Connectors and cables

Coaxial – SHV-10 and SHV-20



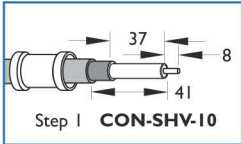
Air service to 85° C



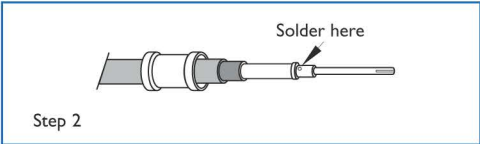
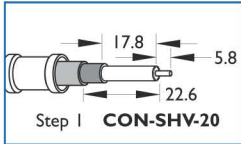
Description

Safe high voltage (SHV) 10 and 20kV connectors feature special high voltage interfaces, and are ideally suited for pulse applications. SHV high voltage connectors are designed for use where the normal operating voltage of standard coaxial connectors is inadequate. Note that SHV-10 and SHV-20 connectors are fitted with a Caburn-MDC BeCu contact to mate with our ceramic to metal feedthroughs.

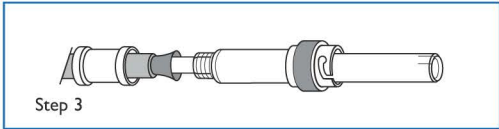
Wiring instructions



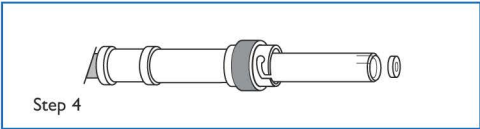
**Step 1** Slide grip sleeve over cable jacket. Cut and strip cable jacket, braided shield and dielectric to dimensions shown above. Wet exposed conductor using a non acid core 60 – 40 tin lead solder. Do not overheat.



**Step 2** Slide cable seal and contact over conductor. Push contact against cable seal and maintain slight pressure while soldering contact in place. Do not overheat.



**Step 3** Flare out cable braid as shown, do not fray. Slide cable assembly into shell, do not pinch or otherwise damage cable seal. Guide braid over splined collar on shell until contact shoulder butts against shell insulator.



**Step 4** Slide grip sleeve forward over braid until it bottoms out on shell. Crimp in place as shown using a crimping tool. Braid should not extend beyond grip sleeve. Finally, slide interface seal into shell until it bottoms out evenly around contact.

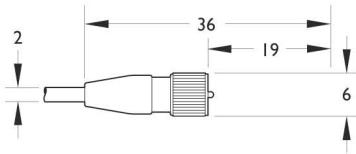
Description	Connector type	Volts	Use cable	Reference	Part number
Coaxial – SHV-10 Connector	Reynolds	10000	RG58, RG58A or RG58C/U	CON-SHV-10	9922010
Coaxial – SHV-20 Connector	Reynolds	20000	RG213/U	CON-SHV-20-RET	9922011
Coaxial – SHV-20 Connector	Kings	20000	RG213/U	CON-SHV-20	9922012

Air service to 125° C



CA

Connector attached measures the distance between the flange face of the feedthrough and the end of the attached connector.



Description

Microdot® coaxial connectors are designed to accept 50Ω miniature coaxial cables. This is a screw type connector which offers the dependability of a threaded coupling. Caburn-MDC offers these Microdot® connectors pre-assembled with 3 metres of RGI78B/U coaxial cable.

Description	Volts	Reference	Part number
Microdot® coaxial connector complete with 3m long cable	500	CON-MDOT	9922008

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

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# Connectors and cables

## Thermocouple – circular MS style



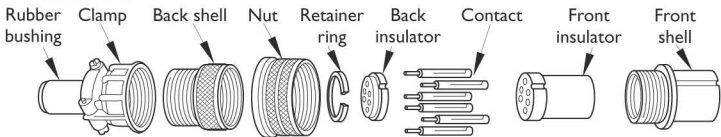
### Wiring instruction for thermocouple MS circular connectors

#### Description

Although these connectors do not carry the MS prefix, they are of the MS type. Other than the alumina ceramic dielectric, these connectors meet standard specifications for MIL-C-5015 connectors. They are solid shell, straight plug threaded connectors with polarizing keyways. The female socket contacts are matched to E, J or K-type thermocouple materials suitable for service in air or vacuum and bakeable to 350°C. The metal shell components are nickel plated aluminium with low vapour pressure characteristics, unlike standard MS circular connectors which are cadmium plated and not suitable for UHV. Due to polarity reversal, air-side connectors cannot be used on the vacuum-side receptacle of a double ended feedthrough. Connectors are sold separately and specifically for air or vacuum service with unique part numbers for each.

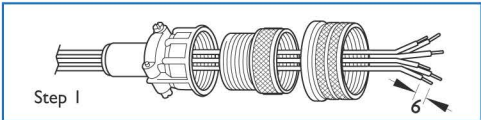
<sup>1</sup> Note that assembly instructions for the 2, 3, 5 and 10 pair thermocouple plugs are identical

#### Parts nomenclature

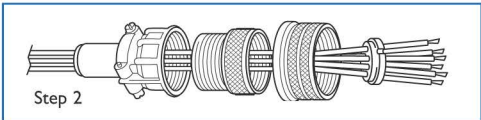


#### Air service to 165°C<sup>1</sup>

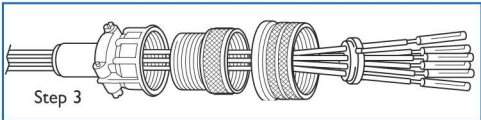
##### Wiring Instructions



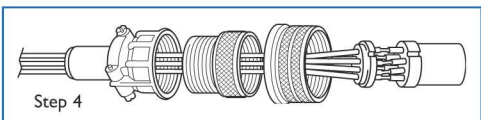
**Step 1** Slide the cable clamp, rubber bushing, back shell and nut (in that order) over cable, then strip each conductor 6mm as detailed.



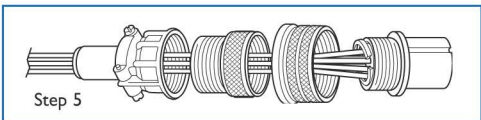
**Step 2** Remove retainer ring from front shell and disassemble by sliding insulators and contacts. Note that the insulator consists of front and back pieces. Insert TC wires through the appropriate holes in back insulator before crimping contacts.



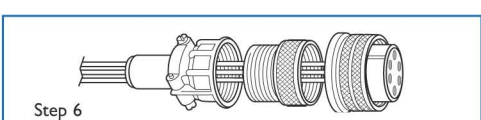
**Step 3** Slide TC contacts on to corresponding TC wire and crimp in place. Note that TC contacts must be crimped to TC wires, never soldered.



**Step 4** Insert crimped TC contacts into appropriate holes in front insulator. Note alignment slots on insulators.



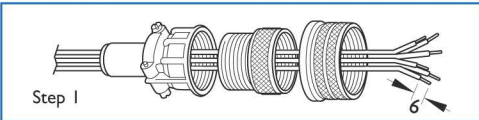
**Step 5** Slide the front and back insulators together and insert them into the front shell. Secure them in place with the retainer ring.



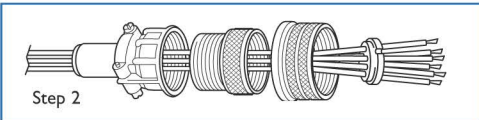
**Step 6** Slide the nut over the front shell, then thread the back shell on to the front shell and tighten. Slide the rubber bushing inside the clamp. Thread the clamp on to the back shell and tighten. Moderately tighten clamp screws to provide adequate strain relief to wire and contacts.

#### Air and vacuum service to 165°C<sup>1</sup>

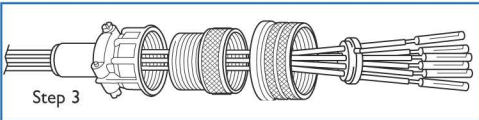
##### Wiring Instructions



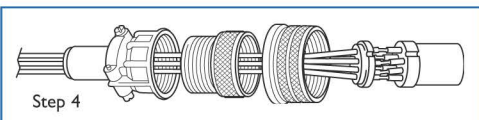
**Step 1** Slide the cable clamp, back shell and nut (in that order) over cable, then strip each conductor 6mm as detailed.



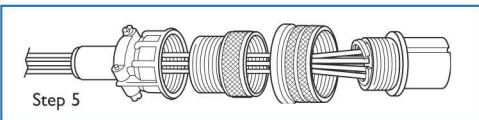
**Step 2** Remove retainer ring from front shell and disassemble by sliding insulators and contacts. Note that the insulator consists of front and back pieces. Insert TC wires through the appropriate holes in back insulator before crimping contacts.



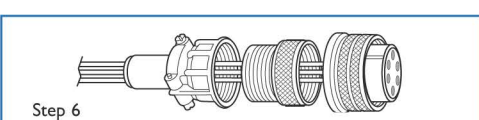
**Step 3** Slide TC contacts on to corresponding TC wire and crimp in place. Note that TC contacts must be crimped to TC wires, never soldered.



**Step 4** Insert crimped TC contacts into appropriate holes in front insulator. Note alignment slots on insulators.



**Step 5** Slide the front and back insulators together and insert them into the front shell. Secure them in place with the retainer ring.



**Step 6** Slide the nut over the front shell, then thread the back shell on to the front shell and tighten. Thread the clamp on to the back shell and tighten. Moderately tighten clamp screws to provide adequate strain relief to wire and contacts.

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





Section 6.8

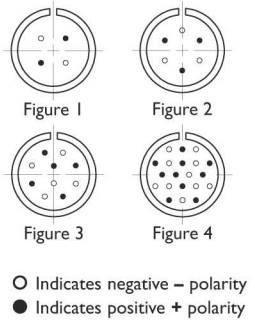
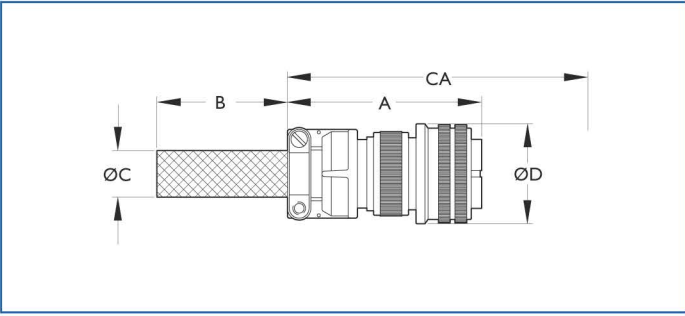
# Connectors and cables

Thermocouple – circular MS style

Feedthroughs – electrical and optical

TC MS Circular connectors–2 to 10 pairs–air service to 125°C

CON-MSE5



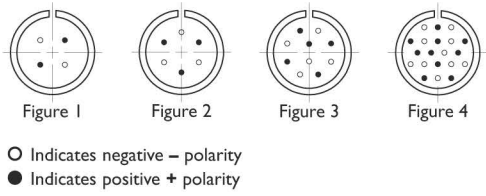
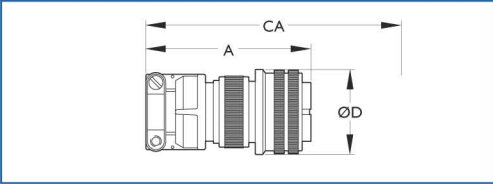
Description	TC type	No. of pairs	Figure	A	B	C	D	Reference	Part number
Circular MS air connector	E	2	1	66	43	14	34	CON-MSE2	9923004
Circular MS air connector	K	2	1	66	43	14	34	CON-MSK2	9923006
Circular MS air connector	E	3	2	66	43	14	34	CON-MSE3	9923007
Circular MS air connector	K	3	2	66	43	14	34	CON-MSK3	9923009
Circular MS air connector	E	5	3	66	43	14	34	CON-MSE5	9923010
Circular MS air connector	K	5	3	66	43	14	34	CON-MSK5	9923012
Circular MS air connector	E	10	4	74	36	19	50	CON-MSE10	9923020
Circular MS air connector	K	10	4	74	36	19	50	CON-MSK10	9923022

TC MS Circular connectors–2 to 10 pairs–air service to 350°C

Description	TC type	No. of pairs	Figure	A	B	C	D	Reference	Part number
Circular MS air connector	E	2	1	2.60	–	0.56	1.35	CON-MSE2-350	9923036
Circular MS air connector	J	2	1	2.60	–	0.56	1.35	CON-MSJ2-350	9923037
Circular MS air connector	K	2	1	2.60	–	0.56	1.35	CON-MSK2-350	9923038
Circular MS air connector	R	3	2	2.60	–	0.56	1.35	CON-MSR3-350	9923039
Circular MS air connector	J	3	2	2.60	–	0.56	1.35	CON-MSJ3-350	9923040
Circular MS air connector	K	3	2	2.60	–	0.56	1.35	CON-MSK3-350	9923041
Circular MS air connector	E	5	3	2.60	–	0.56	1.35	CON-MSE5-350	9923042
Circular MS air connector	J	5	3	2.60	–	0.56	1.35	CON-MSJ5-350	9923043
Circular MS air connector	K	5	3	2.60	–	0.56	1.35	CON-MSK5-350	9923044
Circular MS air connector	E	10	4	2.90	–	0.75	1.97	CON-MSE10-350	9923045
Circular MS air connector	J	10	4	2.90	–	0.75	1.97	CON-MSJ10-350	9923046
Circular MS air connector	K	10	4	2.90	–	0.75	1.97	CON-MSK10-350	9923047

TC MS Circular connectors–2 to 10 pairs–vacuum service to 350°C

CON-IVE5



Description	TC type	No. of pairs	Figure	A	D	Reference	Part number
Circular MS Vacuum Connector	E	2	1	66	34	CON-IVE2	9923024
Circular MS Vacuum Connector	K	2	1	66	34	CON-IVK2	9923026
Circular MS Vacuum Connector	E	3	2	66	34	CON-IVE3	9923027
Circular MS Vacuum Connector	K	3	2	66	34	CON-IVK3	9923029
Circular MS Vacuum Connector	E	5	3	66	34	CON-IVE5	9923030
Circular MS Vacuum Connector	K	5	3	66	34	CON-IVK5	9923032
Circular MS Vacuum Connector	E	10	4	74	50	CON-IVE10	9923033
Circular MS Vacuum Connector	K	10	4	74	50	CON-IVK10	9923035

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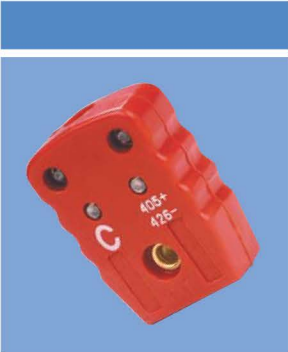


Connectors and cables

Thermocouple – miniature and high voltage

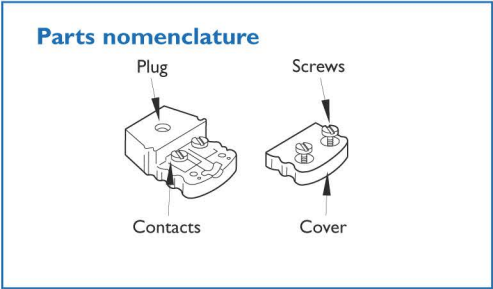
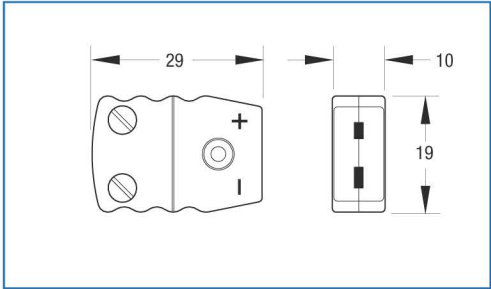


Miniature single pair – air service to 125°C

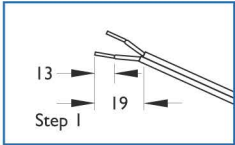


Description

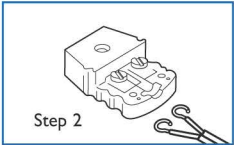
Miniature thermocouple connectors are recommended for use with fine gauge thermocouple wires where standard size connectors are not suitable. These connectors are polarized female socket type connections. Polarization is achieved by the use of two socket sizes, eliminating the possibility of cross polarity.



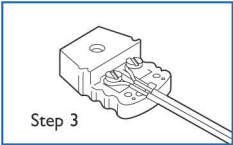
Wiring Instructions



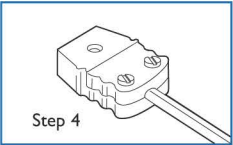
Step 1 Cut and strip thermocouple wire jacket and dielectric as shown.



Step 2 Loop conductor in a clockwise direction as shown to fit around the diameter of the contact screw. Loosen contact screws approximately 3 turns to allow conductor insertion under screw heads.



Step 3 Hook the conductors under screw heads and tighten moderately.



Step 4 Place cover back on plug and tighten moderately.

TC Type	Reference	Part number
C	CON-TCC	9923000
E	CON-TCE	9923001
J	CON-TCJ	9923002
K	CON-TCK	9923003
N	CON-TCN	9923023

High voltage connections

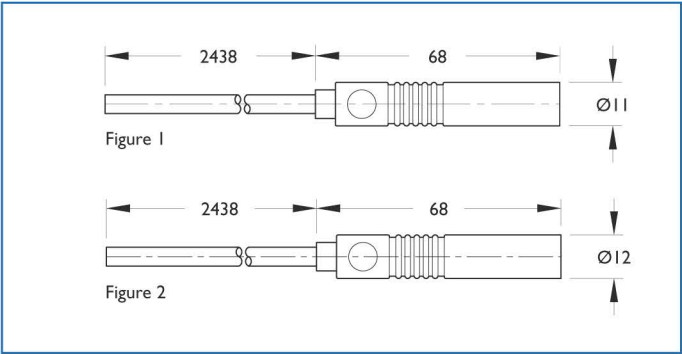
Silicone high voltage–5kV and 20kV–air service–55°C to 125°C

PB5 and PB20



Description

High-voltage connectors are silicone rubber insulated with moulded and prewired high voltage silicone cabling.



Features

- Supplied with standard 2m cables
- Protects operator from exposure to high voltage
- Custom cable lengths available on request

Description	Conductor	Figure	Voltage	Amps	Quantity per package	Reference	Part number
Powerglove 5kV DC	2.4	1	5kV DC	25	1	PB5	9924016
Powerglove 20kV DC	2.4	2	20kV DC	25	1	PB20	9924033

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# Connectors and cables

In-vacuum wire and screw connectors

## Crimp connectors

### PPINS20P



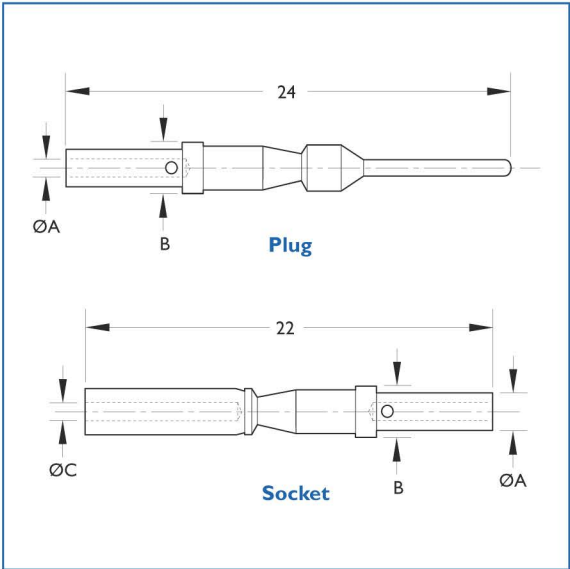
### Description

Four or eight gold-plated pins. Crimp to wire or feedthrough conductor for in-vacuum connection.

### Features

- Gold plated
- Maximum temperature 200°C vacuum

### PPINS20S



Description	Contact size	Diameter A minimum	Diameter B minimum	Maximum diameter C	Quantity per pack	Reference	Part number
Socket	20	1.2	2.6	1.1	25	PPINS20S	1512250
Socket	16	1.7	3.8	1.7	25	PPINS16S	1512251
Socket	12	2.5	5.1	2.5	10	PPINS12S	1512252
Plug	20	1.2	2.6	1.0	25	PPINS20P	1512253
Plug	16	1.7	3.8	1.6	25	PPINS16P	1512254
Plug	12	2.5	5.1	2.4	10	PPINS12P	1512255

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



Connectors and cables

In-vacuum wire and screw connectors



TC – Screws and nut sets – 450°C air and vacuum services

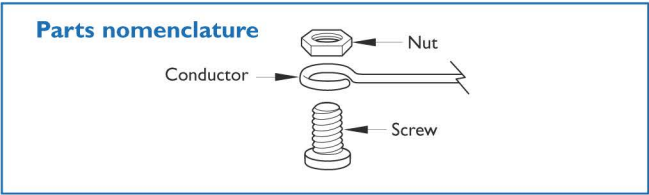
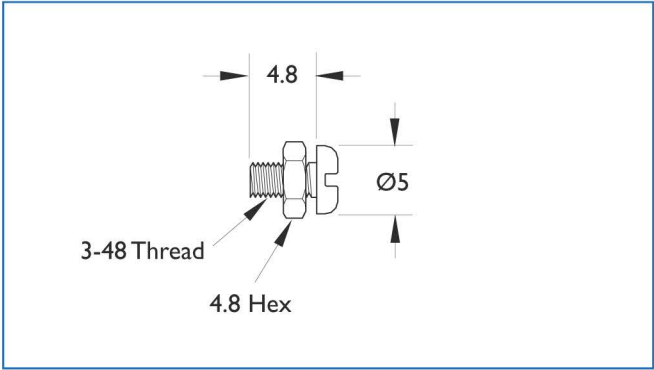


Description

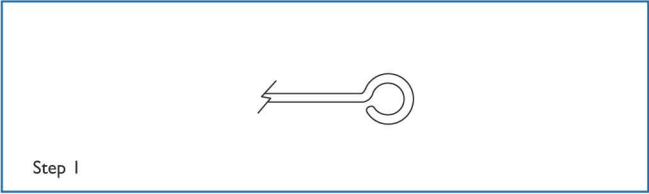
Stainless steel, slotted pan head.

Features

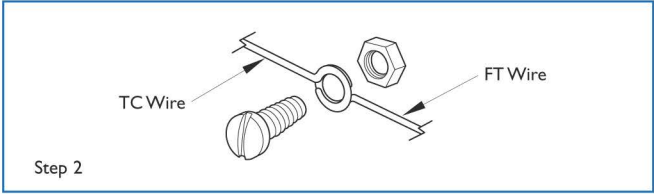
- Supplied complete with hex nut



Wiring instructions



**Step 1** Loosen pan head screw and nut located on conductor ends. Loop thermocouple wires in a clockwise direction to fit around the 2.4mm diameter screws supplied.



**Step 2** Butt TC wires and feedthrough wires together as shown. Be sure to match for proper polarity – insert screw through looped wires and fasten with nut and tighten adequately.

Description	Material	Use cable	Reference	Part number
TC Screw and nut set	Stainless steel	I0	TCS	9923019












Connectors and cables

In-vacuum connectors

Connector to conductor diameter reference table

Connector types	Feedthrough conductor sizes mm / inches									
	0.81 .032	1.27 .050	1.42 .056	2.35 .092	2.39 .094	3.96 .156	4.06 .160	6.35 .250	9.65 .380	19.05 .750
<div>Power crimp</div> <div></div>	9924000									
<div>TC Crimp</div> <div></div>			9920013 9920014 9920015 9920016 9920017 9920018							
<div>Power push-on</div> <div></div>		9924001	9924002	9924003	9924003			9924010		
<div>Power in-line</div> <div></div>			9924004	9924006	9924006	9924007	9924007	9924008		
<div>Powerglove® Air-side only</div> <div></div>					9924016 9924024					
<div>In-line clamp</div> <div></div>						991536	991536	991536		
<div>Right-angle clamp</div> <div></div>						991537	991537	991537		
<div>Caburn-MDC custom connectors</div>	Contact technical sales									

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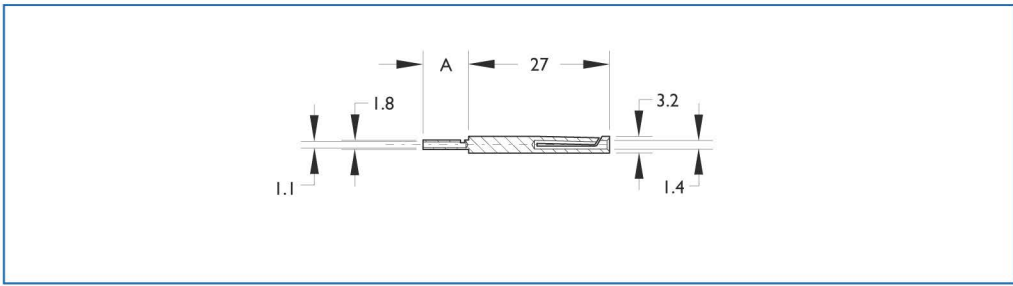
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Connectors and cables

In-vacuum connectors

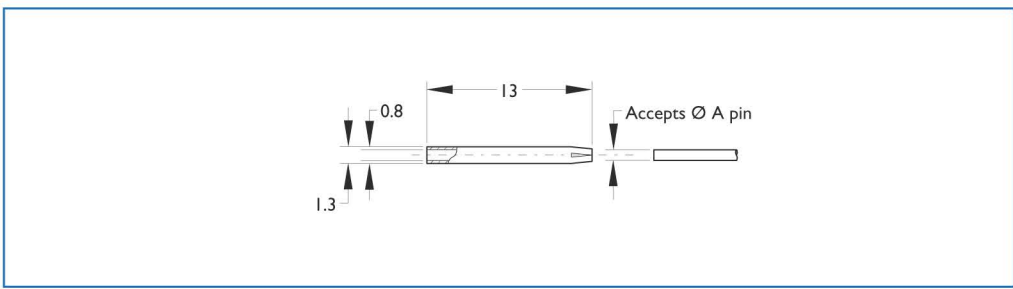


TC – Crimp push – 350°C air and vacuum service



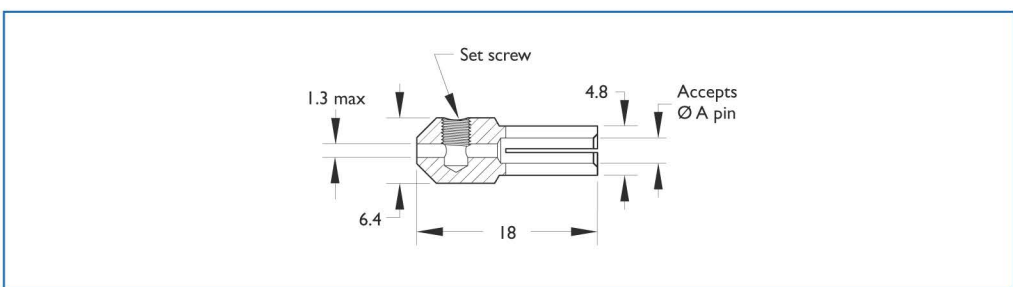
Material	Diameter A	Quantity per pack	Reference	Part number
Chromel®	7	5	TCP-CH	9923013
Alumel®	7	5	TCP-AL	9923014
Iron	8	5	TCP-FE	9923015
Constantan J	8	5	TCP-J	9923016
Constantan E & T	8	5	TCP-ET	9923017
Nickel-200	8	5	TCP-NI	9923018

Power crimp – 150°C air – 200°C vacuum service

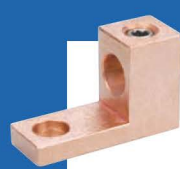


Material	Diameter A	Quantity per pack	Reference	Part number
BeCu	0.81	10	PC-032	9924000

Power push-on – 150°C air – 200°C vacuum service complete with set screw



Material	Diameter A	Quantity per pack	Reference	Part number
BeCu	1.3	10	PPO-050	9924001
BeCu	1.5	10	PPO-060	9924002
BeCu	2.4	10	PPO-094	9924003
BeCu	6.4	2	PPO-250	9924010

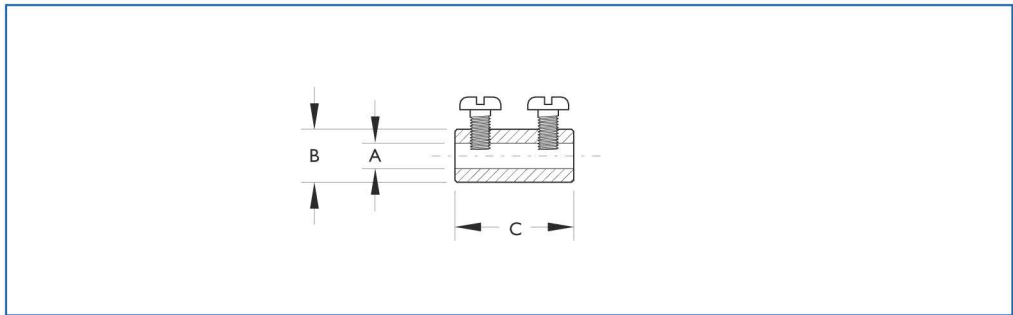


# Connectors and cables

In-vacuum connectors

Power in-line – 150°C air – 400°C vacuum service complete with pan head screws

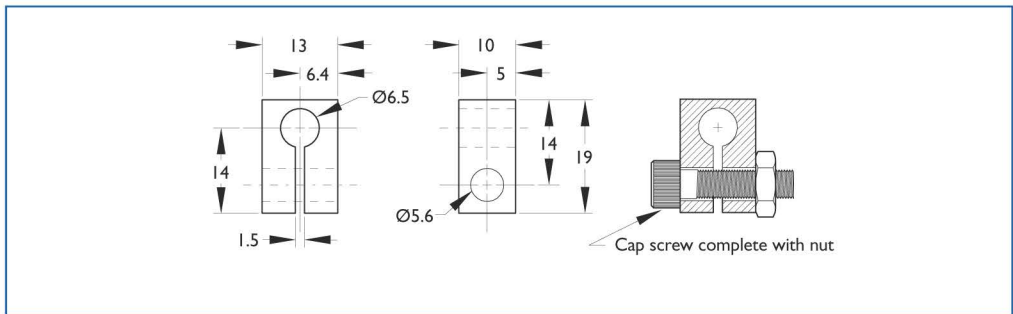
## PIL-260



Material	Diameter A	Diameter B	C	Quantity per pack	Reference	Part number
BeCu	1.5	5	13	10	PIL-059	9924004
BeCu	1.8	5	13	10	PIL-072	9924005
BeCu	3.0	6	14	10	PIL-120	9924006
BeCu	3.4	6	16	10	PIL-134	9924007
BeCu	6.6	13	25	10	PIL-260	9924008

In-line clamp connectors complete with cap head screw

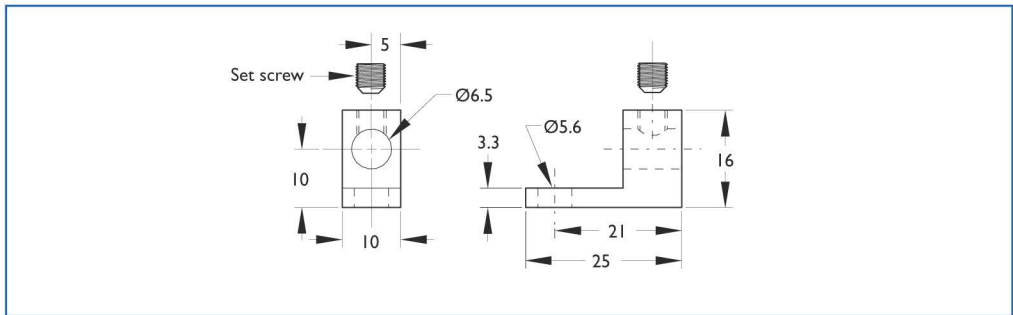
## IPLC



Material	Quantity per pack	Reference	Part number
Copper	1	ILPC	991536

Right-angle connectors complete with set screw

## RAPC



Material	Quantity per pack	Reference	Part number
Copper	1	RAPC	991537

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Connectors and cables

Subminiature-D connectors



UHV Connectors and contacts

D25-BCON2M Male with 1510101 contacts



D50-BCON2F

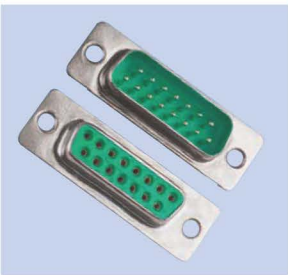


No. of wires	Connector type	Connector width	Connector depth	Use height	Contact	Reference	Part number
UHV Vacuum connectors							
9	Male	33	19	13	1510101	D9-BCON2M	1510020
15	Male	42	19	13	1510101	D15-BCON2M	1510021
25	Male	56	19	13	1510101	D25-BCON2M	1510022
50	Male	67	19	13	1510101	D50-BCON2M	1510023
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
Contacts							
1 pack male contacts 25 pieces per package						DPINMC	1510101
1 pack female contacts 25 pieces per package						DPINFC	1510100

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

HV Connectors and contacts

D15-BCON1M with 1510104 contacts



Air side connector



No. of wires	Connector type	Connector width	Connector depth	Use height	Contact	Reference	Part number
UHV Vacuum connectors							
9	Male	33	19	13	1510101	D9-BCON1M	1510006
15	Male	42	19	13	1510101	D15-BCON1M	1510007
25	Male	56	19	13	1510101	D25-BCON1M	1510008
50	Male	67	19	13	1510101	D50-BCON1M	1510009
9	Female	33	19	13	1510100	D9-BCON1F	1510000
15	Female	42	19	13	1510100	D15-BCON1F	1510001
25	Female	56	19	13	1510100	D25-BCON1F	1510002
50	Female	67	19	13	1510100	D50-BCON1F	1510003
Contacts							
1 pack male contacts 25 pieces per package						DPIN-MPOS	1510114
1 pack female contacts 25 pieces per package						DPIN-FPOS	1510113

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

No. of wires	Connector type	Reference	Part number
Air side connector			
9	Female	D9-AC	1510990
15	Female	D15-AC	1510991
25	Female	D25-AC	1510992
50	Female	D50-AC	1510993

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Connectors and cables

Subminiature-D coaxial / subminiature-C connectors

Air-service adaptor Female-BNC / Female-SMA

DC-BA588



Product type	First end	Second end	Reference	Part number
Adaptor	Female-BNC	Female-SMA	DC-BA588	1512728

Air-service adaptor Male-BNC / Female-SMA

DC-BA29



Product type	First end	Second end	Reference	Part number
Adaptor	Male-BNC	Male-SMA	DC-BA29	1512730

Air-service adaptor Female-BNC / Female-BNC

DA-BA80



Product type	First end	Second end	Reference	Part number
Adaptor	Male-BNC	Female-BNC	DC-BA80	1512731

HV Connectors and contacts

UHV Female C9-VCS and Male C9-VCP



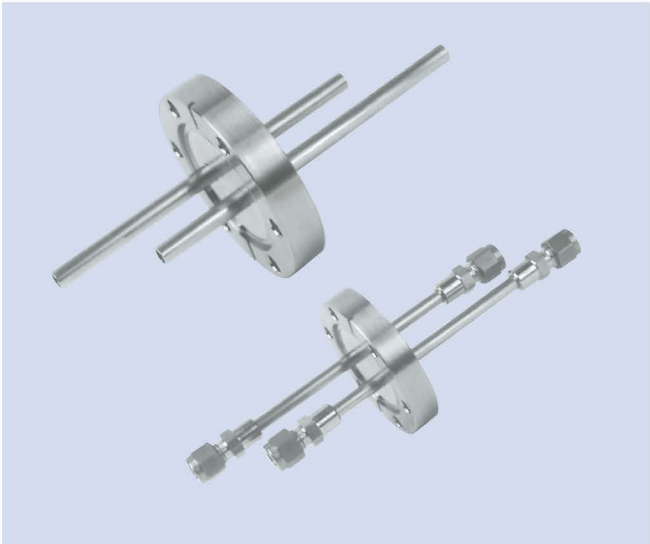
No. of pins	Service type	Connector type	Connector OD	Connector length	Use contact	Reference	Part number
Connectors							
9	UHV	Male	16	13	1510103	C9-VCP	1512606
9	UHV	Female	16	19	1510102	C9-VCS	1512603
9	Air	Female	16	19	1510102	C9-ACS	1512602
Contacts							
1 pack UHV / Air male contacts 10 pieces per package						DPINMC-10	1510103
1 pack UHV / Air female contacts 10 pieces per package						DPINFNC-10	1510102

Connectors do not include contacts which must be purchased separately  
These connectors and contacts will mate with 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 - Weights given are approximate



Section 6.6  
Liquid  
Introduction



Liquid is the designation Caburn-MDC gives to a series of non-electrical feedthrough products designed for the transmission of fluids and gases into high and ultrahigh vacuum environments. Caburn-MDC offers two product categories: water and liquid nitrogen feedthroughs.

**Water feedthroughs** are used to transfer coolant to processing equipment inside a vacuum. For example, electron beam evaporation sources must be in a high-vacuum environment and generating a densely focused electron beam to produce enough heat to evaporate alumina ceramics; water cooling is therefore required to prevent damage to evaporation crucibles and electromagnetic coils used respectively to contain the molten alumina and focus the electron beam.

**Liquid nitrogen feedthroughs** are used for the same cooling purposes as water feedthroughs but offer lower temperature (-200°C) capabilities and therefore greater cooling rates. Liquid nitrogen feedthroughs are designed to minimize heat transfer between coolant lines and vacuum mounts. Ice build up can be detrimental to the sealing characteristics of a vacuum mount.

Thermal insulation in liquid nitrogen lines is achieved through double wall coaxial construction. A 6.4mm diameter cooling line is inserted and welded to one end of a 12.7mm diameter support tube. The opposite end of the 12.7mm support tube is welded to the vacuum mount which, when evacuated, creates a coaxial vacuum cavity between the two tubes. This cavity is an excellent thermal barrier, which prevents ice build up on the air side of the vacuum mount.

Vacuum mount fitted, water and liquid nitrogen feedthroughs are constructed with 6.4mm diameter, type 304 stainless steel tubing with a choice of three industry standard fittings, Weld-tube (plain tubes without fittings), 6.4mm diameter Swagelok® compression fittings or 64mm diameter male VCR® metal gasket seal fittings. Mating VCR® female nuts and metal copper gaskets must be purchased separately.



UHV and HV series

Caburn-MDC offers two standard vacuum mount styles.



Part numbers printed in light blue indicate products that are suitable for -200°C cryogenic applications

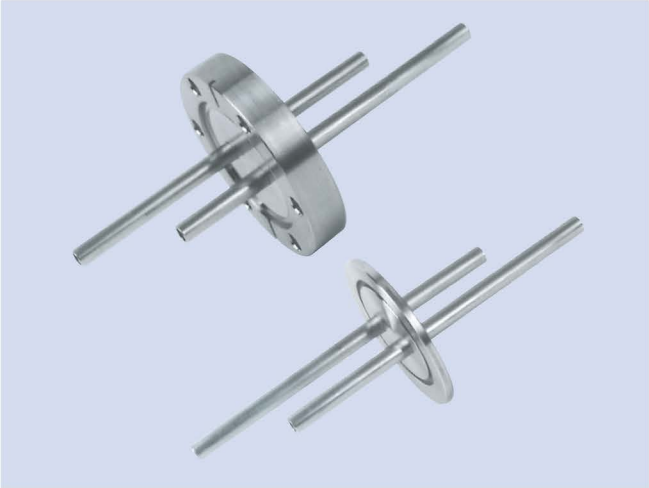
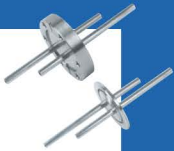
General specifications

Type	Tubes	Maximum bakeout temperature	Fittings
<div>Water</div> <div></div>	6.4mm (1/4") diameter Type 304 stainless steel	CF Flange to 450°C ISO KF Flange to 150°C 25mm to 150°C Baseplate 150°C Weldable 450°C	Weldable 6.4mm (1/4") Swagelok® 6.4mm (1/4") Male VCR®
<div>Liquid nitrogen</div> <div></div>	6.4mm (1/4") diameter Type 304 stainless steel	CF Flange to 450°C ISO KF Flange to 150°C 25mm to 150°C Baseplate 150°C Weldable 450°C	Weldable 6.4mm (1/4") Swagelok® 6.4mm (1/4") Male VCR®

**Customer note** All Swagelok® and VCR® fittings are supplied in imperial (inch) sizes  
For metric fittings, contact your local technical sales team

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Features

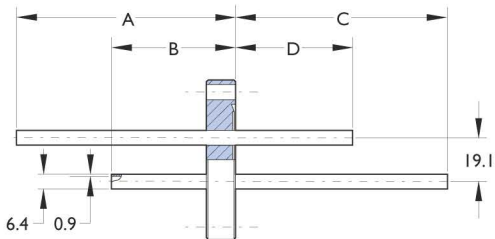
- In-vacuum accessories available
- 2 standard vacuum mounting styles
- Custom feedthrough configurations available upon request

Specifications

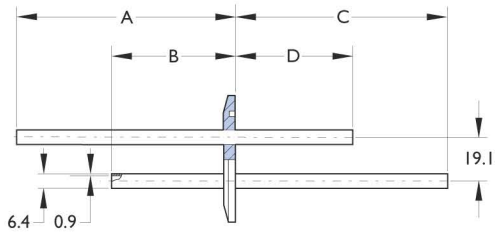
Material	
Flanges	304 Stainless steel
Vacuum range	
UHV / HV	$1 \times 10^{-10}$ mbar / $1 \times 10^{-8}$ mbar
Temperature range <sup>1</sup>	
CF Flange mounted feedthrough	-100°C to 450°C
ISO KF Flange mounted feedthrough	-20°C to 150°C
Weldable feedthrough	-100°C to 450°C
Dimensions	Reference only, subject to change

<sup>1</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

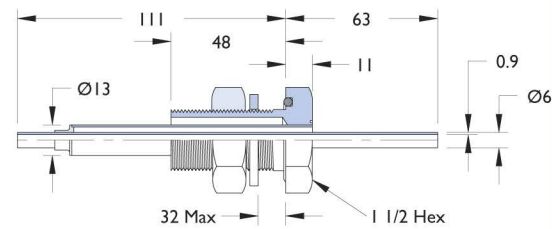
UHV and HV series



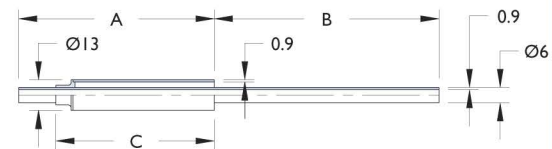
CF Mount Figure 1



ISO KF Mount Figure 2



Baseplate mount Figure 3



Weldable mount Figure 4

Number of tubes	Flange	Fitting	Fig.	A	B	C	D	Reference	Part number
1	DN16CF	Tubeweld	1	95	–	–	51	CLF16-1	9812000
1	DN40CF	Tubeweld	1	95	–	–	51	CLF40-1	9812001
2	DN40CF	Tubeweld	1	95	54	92	51	CLF40-2	9812002

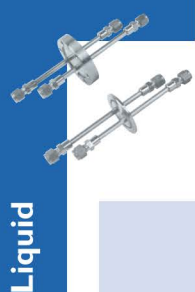
Number of tubes	Flange	Fitting	Figure	A	B	C	D	Reference	Part number
1	DN16KF	Tubeweld	2	95	–	–	51	KLF16-1	9813000
1	DN25KF	Tubeweld	2	95	–	–	51	KLF25-1	9813001
1	DN40KF	Tubeweld	2	95	–	–	51	KLF40-1	9813002
1	DN50KF	Tubeweld	2	95	–	–	51	KLF50-1	9813003
2	DN40KF	Tubeweld	2	95	54	92	51	KLF40-2	9813004
2	DN50KF	Tubeweld	2	95	54	92	51	KLF50-2	9813005

Number of tubes	Mount diameter	Figure	Reference	Part number
1	25.4	4	BLF25	9814000

Number of tubes	Mount diameter	Figure	Reference	Part number
1	13	4	WLF13	9811000

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

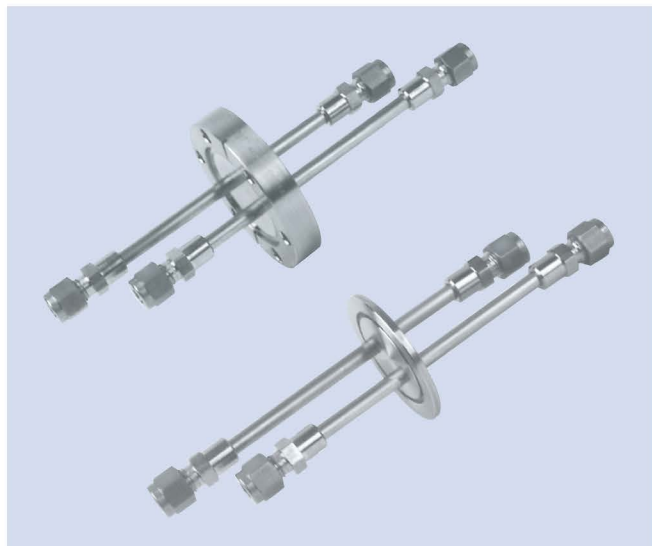




# Section 6.6

## Liquid

Water – Swagelok®



### Features

- In-vacuum accessories available
- 3 standard vacuum mounting styles
- Custom feedthrough configurations available upon request

### Specifications

#### Material

Flanges	304 Stainless steel
Tubes / fittings	304 Stainless steel

#### Vacuum range

UHV / HV	$1 \times 10^{-10}$ mbar / $1 \times 10^{-8}$ mbar
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#### Temperature range<sup>1</sup>

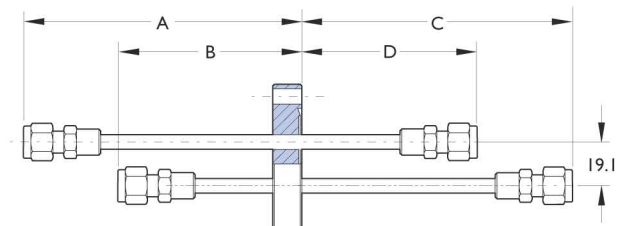
CF Flange mounted feedthrough	-100°C to 450°C
ISO KF Flange mounted feedthrough	-20°C to 150°C
Weldable feedthrough	-100°C to 450°C

#### Dimensions

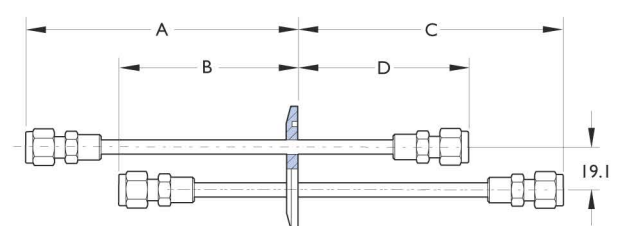
Reference only, subject to change

<sup>1</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

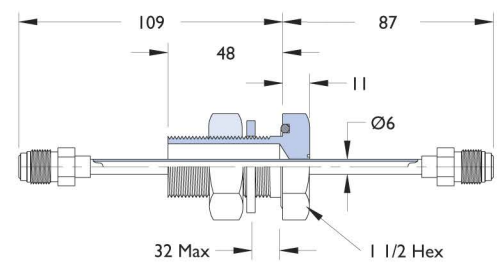
### UHV and HV series



CF Mount Figure 1



ISO KF Mount Figure 2



Baseplate mount Figure 3

#### Customer note

All Swagelok® and VCR® fittings are supplied in imperial (inch) sizes  
For metric fittings, contact your local technical sales team

Number of tubes	Flange	Fitting	Figure	A	B	C	D	Reference	Part number
1	DN16CF	Swagelok®	1	121	–	–	76	CLF16-1S	9812003
1	DN40CF	Swagelok®	1	121	–	–	76	CLF40-1S	9812004
2	DN40CF	Swagelok®	1	121	79	118	76	CLF40-2S	9812005

Number of tubes	Flange	Fitting	Figure	A	B	C	D	Reference	Part number
1	DN16KF	Swagelok®	2	121	–	–	76	KLF16-1S	9813006
1	DN25KF	Swagelok®	2	121	–	–	76	KLF25-1S	9813007
1	DN40KF	Swagelok®	2	121	–	–	76	KLF40-1S	9813008
1	DN50KF	Swagelok®	2	121	–	–	76	KLF50-1S	9813009
2	DN40KF	Swagelok®	2	121	79	118	76	KLF40-2S	9813010
2	DN50KF	Swagelok®	2	121	79	118	76	KLF50-2S	9813011

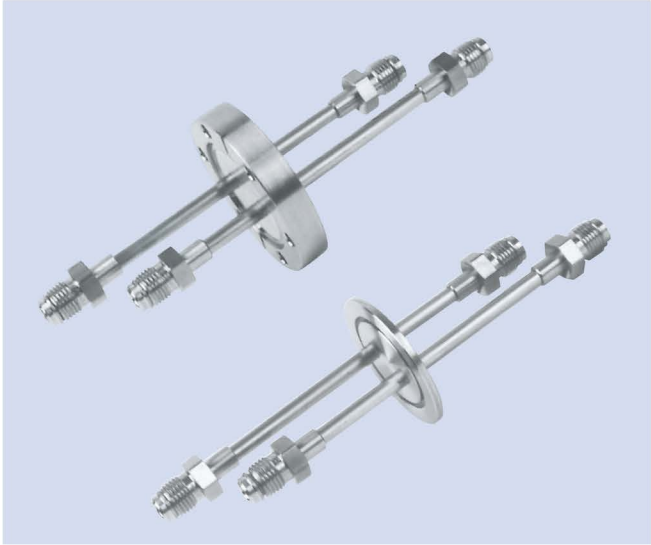
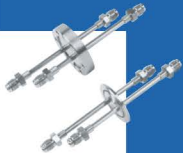
  

Number of tubes	Mount diameter	Figure	Reference	Part number
1	25.4	3	BLF25-1S	9814001

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

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Features

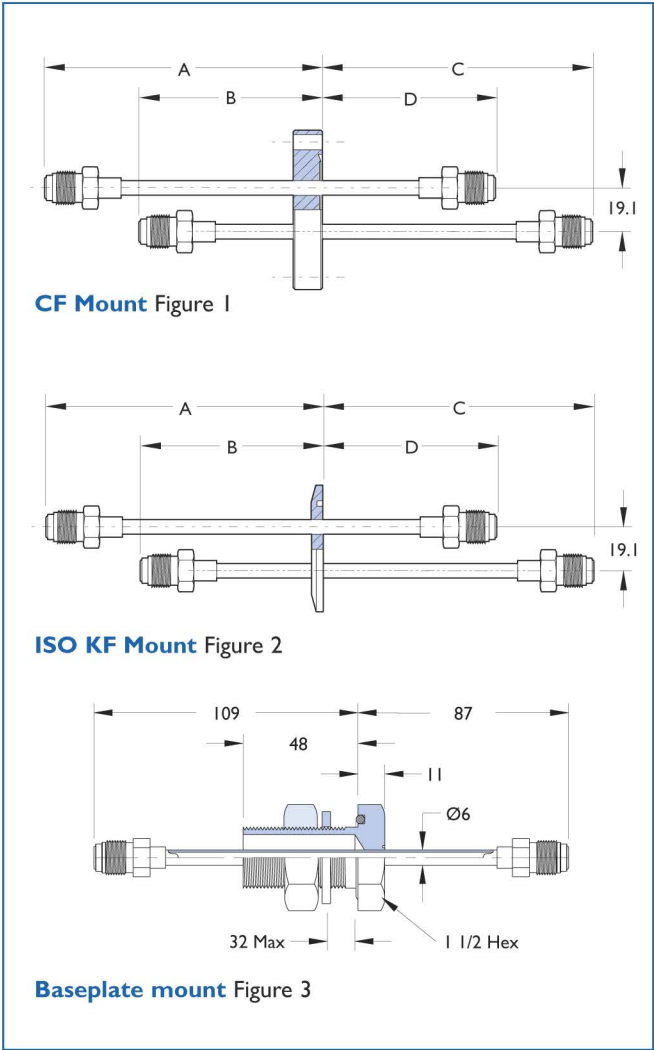
- In-vacuum accessories available
- 3 standard vacuum mounting styles
- Custom feedthrough configurations available upon request

Specifications

Material		
Flanges	304 Stainless steel	
Tubes	304 Stainless steel	
Vacuum range		
UHV	1×10 <sup>-10</sup> mbar	
Temperature range <sup>1</sup>		
CF Flange mounted feedthrough	-100°C to 450°C	
ISO KF Flange mounted feedthrough	-20°C to 150°C	
Weldable feedthrough	-100°C to 450°C	
Dimensions		Reference only, subject to change

<sup>1</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

UHV and HV series



**Customer note**  
All Swagelock® and VCR® fittings are supplied in imperial (inch) sizes  
For metric fittings, contact your local technical sales team

Number of Tubes	Flange	Fitting	Figure	A	B	C	D	Reference	Part number
1	DN16CF	VCR®	1	121	–	–	76	CLF16-1V	9812006
1	DN40CF	VCR®	1	121	–	–	76	CLF40-1V	9812007
2	DN40CF	VCR®	1	121	79	118	76	CLF40-2V	9812008

Number of Tubes	Flange	Fitting	Figure	A	B	C	D	Reference	Part number
1	DN16KF	VCR®	2	121	–	–	76	KLF16-1V	9813012
1	DN25KF	VCR®	2	121	–	–	76	KLF25-1V	9813013
1	DN40KF	VCR®	2	121	–	–	76	KLF40-1V	9813014
1	DN50KF	VCR®	2	121	–	–	76	KLF50-1V	9813015
2	DN40KF	VCR®	2	121	79	118	76	KLF40-2V	9813016
2	DN50KF	VCR®	2	121	79	118	76	KLF50-2V	9813017

Number of tubes	Mount diameter	Figure	Reference	Part number
1	25.4	5	BLF25-1V	9814002

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



## Section 6.6

## Liquid

## Nitrogen – Tube



## Features

- In-vacuum accessories available
- 3 standard vacuum mounting styles
- Custom feedthrough configurations available upon request

## Specifications

## Material

Flanges	304 Stainless steel
Tubes	304 Stainless steel

## Vacuum range

UHV	$1 \times 10^{-10}$ mbar
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Temperature range<sup>1</sup>

CF Flange mounted feedthrough	-100°C to 450°C
ISO KF Flange mounted feedthrough	-20°C to 150°C
Weldable feedthrough	-100°C to 450°C

Dimensions Reference only, subject to change

<sup>1</sup> Overall assembly ratings must be adjusted to that of the lowest rated component.

No. of tubes	Flange	Fig.	A	B	Reference	Part number
1	DN16KF	3	151	75	KLN16-I	9813100
1	DN25KF	3	148	77	KLN25-I	9813101
1	DN40KF	3	148	77	KLN40-I	9813102
1	DN50KF	3	148	77	KLN50-I	9813103
2	DN40KF	4	–	–	KLN40-2	9813104
2	DN50KF	4	–	–	KLN50-2	9813105

No. of tubes	Mount dia.	Fig.	Reference	Part number
1	25.4	5	BLN25-I	9814100

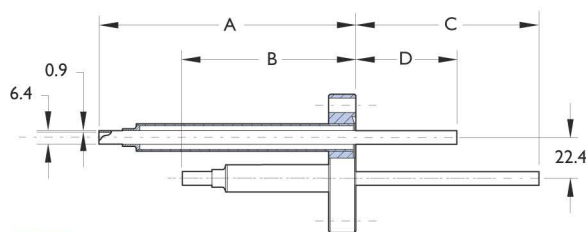
Mount dia.	Fig.	A	B	C	Reference	Part number
13	6	123	52	107	WLM13L	9811101
13	6	81	93	66	WLM13	9811102

Number of tubes	Flange	Fitting	A	B	C	D	Reference	Part number
1	DN16CF	Tube weld	124	–	–	51	CLN16-I	9812100
1	DN40CF	Tube weld	124	–	–	51	CLN40-I	9812101
2	DN40CF	Tube weld	124	83	92	51	CLN40-2	9812102

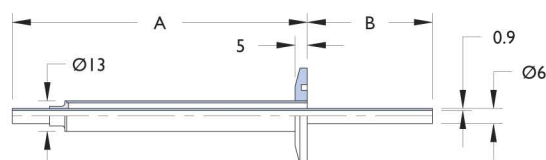
 Part numbers printed in light blue indicate products that are suitable for -200°C cryogenic applications

## Feedthroughs – electrical and optical

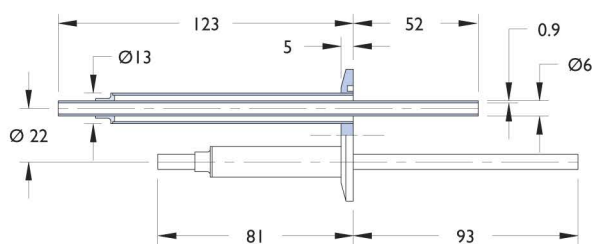
## UHV Series



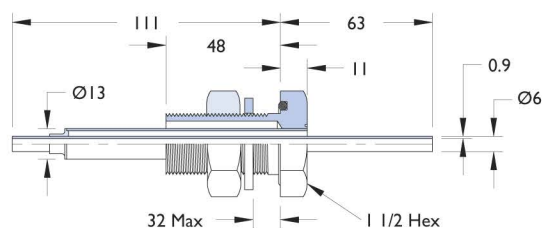
CF Mount Figure 1



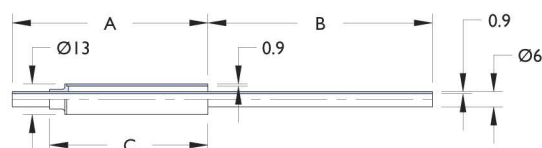
ISO KF Mount Figure 2



ISO KF Mount Figure 3



Baseplate mount Figure 4



Weldable mount Figure 5

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

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Features

- In-vacuum accessories available
- 2 standard vacuum mounting styles
- Custom feedthrough configurations available upon request

Specifications

Flanges	304 Stainless steel
Tubes	304 Stainless steel
Vacuum range	
UHV	1×10 <sup>-10</sup> mbar

Temperature range <sup>1</sup>	
CF Flange mounted feedthrough	-100°C to 450°C
ISO KF Flange mounted feedthrough	-20°C to 150°C
Weldable feedthrough	-100°C to 450°C

Dimensions	Reference only, subject to change
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<sup>1</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

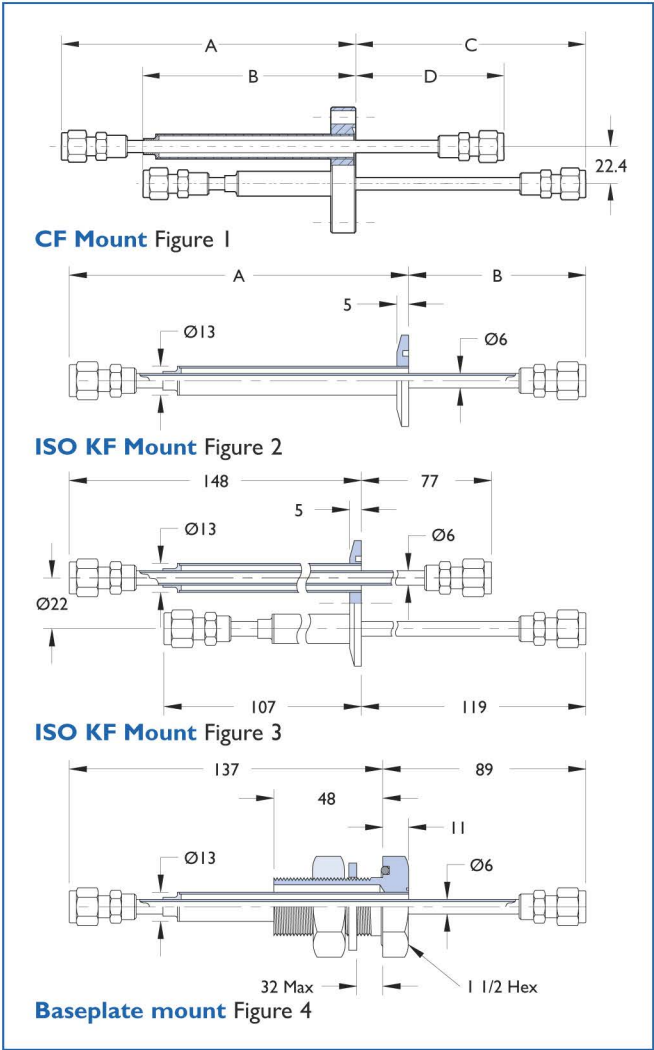
Number of tubes	Flange	Fitting	Figure	A	B	C	D	Reference	Part number
1	DN16CF	Swagelok®		124	–	–	76	CLN16-IS	9812103
1	DN40CF	Swagelok®		124	–	–	76	CLN40-IS	9812104
2	DN40CF	Swagelok®	1	124	108	118	76	CLN40-2S	9812105

Number of tubes	Flange	Figure	A	B	Reference	Part number
1	DN16KF	2	151	75	KLN16-IS	9813106
1	DN25KF	2	148	77	KLN25-IS	9813107
1	DN50KF	2	148	77	KLN50-IS	9813108
2	DN40KF	3	–	–	KLN40-2S	9813109
2	DN50KF	3	–	–	KLN50-2S	9813110

Number of tubes	Mount diameter	Figure	Reference	Part number
1	25.4	4	BLN25-I	9814002

Part numbers printed in light blue indicate products that are suitable for -200°C cryogenic applications

UHV Series



**Customer note**  
All Swagelok® and VCR® fittings are supplied in imperial (inch) sizes. For metric fittings, contact your local technical sales team.



## Section 6.6

## Liquid

Nitrogen – VCR®

## Feedthroughs – electrical and optical



## Features

- In-vacuum accessories available
- 2 standard vacuum mounting styles
- Custom feedthrough configurations available upon request

## Specifications

## Material

Flanges 304 Stainless steel

Tubes 304 Stainless steel

## Vacuum range

UHV  $1 \times 10^{-10}$  mbarTemperature range<sup>1</sup>

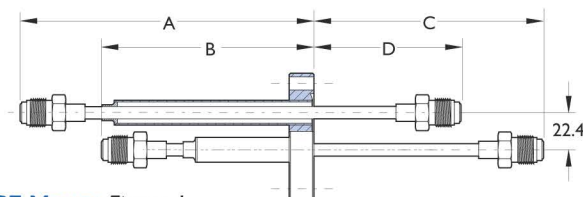
CF Flange mounted feedthrough -100°C to 450°C

ISO KF Flange mounted feedthrough -20°C to 150°C

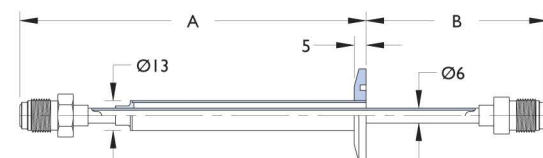
Weldable feedthrough -100°C to 450°C

**Dimensions** Reference only, subject to change<sup>1</sup> Overall assembly ratings must be adjusted to that of the lowest rated component

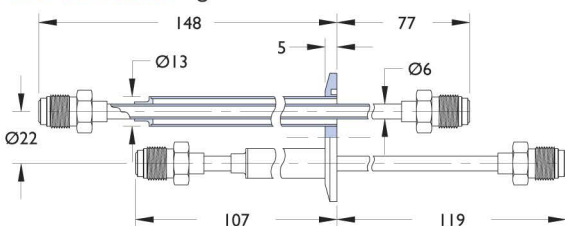
## UHV Series



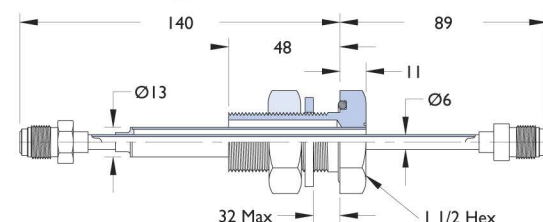
CF Mount Figure 1



ISO KF Mount Figure 2



ISO KF Mount Figure 3



Baseplate mount Figure 4

## Customer note

All Swagelok® and VCR® fittings are supplied in imperial (inch) sizes

For metric fittings, contact your local technical sales team

Number of tubes	Flange	Fitting	Figure	A	B	C	D	Reference	Part number
1	DN16CF	VCR®	1	124	–	–	76	CLN16-IV	9812106
1	DN40CF	VCR®	1	124	–	–	76	CLN40-IV	9812107
2	DN40CF	VCR®	1	124	108	118	76	CLN40-2V	9812108

Number of tubes	Flange	Figure	A	B	Reference	Part number
1	DN16KF	3	151	75	KLN16-IV	9813112
1	DN25KF	3	148	77	KLN25-IV	9813113
1	DN50KF	3	148	77	KLN40-IV	9813114
2	DN40KF	4	–	–	KLN40-2V	9813115
2	DN50KF	4	–	–	KLN50-2V	9813116

Number of tubes	Mount diameter	Figure	Reference	Part number
1	25.4	5	BLN25-IV	9814102

 Part numbers printed in light blue indicate products that are suitable for -200°C cryogenic applications

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