

Feedthroughs

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➤ Feedthroughs

Introduction

As used here, the word *feedthrough* applies to devices that transfer all types of services, utilities, and signals through the vacuum wall.

The major divisions are electrical, gas and liquid, cryogen (LN₂), and optical. While many regard them as feedthroughs, these Technical Notes do not cover viewports (Section 1) or motion devices (Section 8).



Power Feedthroughs

■ Electrical Feedthroughs

Electrical feedthroughs are divided into four groups: Power, Instrumentation, Thermocouple, and Ceramic Breaks.

■ Power Feedthroughs

Power feedthroughs have one or multiple conductors penetrating the vacuum wall to carry electricity to any powered vacuum device. Each conductor is sealed to an electrical insulator that, in turn, is sealed to a weldable flange or baseplate coupling.

The insulator can be any material suitable for the application's voltage isolation, vacuum level, and temperature extremes. The most common insulator is alumina, which is UHV-compatible, has high dielectric strength, and a temperature range from -196° C to 450° C. Occasionally, phenolic and Teflon insulators are satisfactory for high-current/low-voltage applications in rough- and high-vacuum conditions.

The conductor metals (Cu, Ni, SS, etc.) are available in wire, rod, or tube form. The last is often used to power a device that also needs gas or liquid flow through it.

When choosing power feedthroughs, the important criteria are maximum operating voltage, maximum current per conductor, base pressure requirements, and the working environment (i.e., backfill gas pressure, composition of gas, etc.). While voltage, current, base pressure, and temperature are usually easy to specify, the working environment may be difficult (see Gas Discharges).

Never under-specify either voltage or current because arcing, melting, or insulator cracking could result.

Gas Discharges

A feedthrough's maximum voltage rating is determined in air at one atmosphere pressure. For reasons beyond the scope of these Notes, different gases can have very different breakdown voltages (BVs). For example, a paper from Rensselaer Polytechnic shows helium's BV is roughly half air's BV, for some given conditions.

As a gross generalization, the simpler the gas's structure, the lower its BV. The atomic inert gases, particularly helium, have a low BV under most backfill pressures. Complex gas molecules have high BVs and tend to quench discharges—which is why SF₆ is used in transmission power line switches and breakers.

■ Instrument Feedthroughs

Instrument feedthroughs are specifically designed to transfer low-current, low- or high-voltage signals from low- or high-impedance sources across the vacuum wall. They have one or multiple conductors ("pins") that are terminated on the air-side in a standard electrical plug/socket ("single-ended feedthrough"). Some types also have connector terminations on the vacuum-side ("double-ended").

Single-pin feedthroughs are often coaxially shielded and intended for applications where the signal source is close to ground (earth) potential but has a high impedance and is susceptible to induced electrical noise.

The standard coaxial plug options are BNC, MHV, various SHVs, N, Microdot, SMA, and SMB. The characteristics and wiring instructions for each are described on the connector's product introductory page.

Versions of various feedthrough types have floating shields—used when transferring signals from sources at high potential—requiring the shield be separately powered to similar potential. To make the complete cable effective, coaxial connectors must be of similar impedance to the cable. (see Coaxial Cables)

Multi-pin feedthroughs, which are not coaxially shielded, are used for low impedance sources where induced noise is less significant. Most single-ended instrument feedthroughs are supplied with the air-side mating connector. Double-ended feedthroughs are not supplied with the vacuum-side connectors.

When choosing an instrumentation feedthrough, there are many critical issues, depending on the application: maximum voltage cable-to-shield, maximum voltage shield-to-ground (for isolated shields), grounding/isolation, signal voltage, impedance, temperature range, number of connections, connectors, etc. It is always prudent to confirm which connectors are or are not supplied.

Coaxial Cables

A coaxial cable has a center conductor insulated from a conducting outer shield. This construction shields the central conductor against inductive "pick-up" (noise) from outside sources and provides stable, repeatable signal transmission. But equally, it shields sensitive electronic equipment from radiation emanating from the central conductor.

In vacuum applications coaxial cables typically carry measurement signals.

A coaxial cable's main characteristic is its impedance (the "total opposition to the flow of alternating current along the cable" expressed in ohms). The impedance is a function of the diameter and spacing of conductors and the insulator's dielectric constant, but **not** a function of its length.

The most frequently used impedance in vacuum application is 50 ohm, with cable identifications such as RG8/U, RG58/U, RG6, and RG580. For any impedance cable, the maximum (signal) power transfer occurs where the "load" equals the cable's impedance.

Normal coaxial connectors have impedance close to the cable's impedance, typically within a range of 48–52 ohms. However, matched connectors with 50-ohm impedance are available.



Instrument Feedthroughs

➤ Feedthroughs

■ Thermocouple Feedthroughs

Thermocouples (T/Cs) are two dissimilar metal wires that meet at a (welded) junction. The junction's temperature and the individual wire's composition determine the voltage difference (often called "EMF" for electromotive force) between the wires' ends. Ideally, each wire's composition is unchanged from junction to the measurement device—nominally a voltmeter. That means the signals should be transferred through the vacuum wall by wires of identical composition too, and that is the function of a T/C feedthrough.

T/C feedthroughs can have one or multiple pairs of wires. The wires are air-side terminated to accept one of several connections methods: molded plugs, push-on split connectors, flat areas drilled for screw/nut, lugs for screw/nut, and screw connectors (for multipair feedthroughs).

Vacuum-side connections might be push-on split connectors, flat areas drilled for screw/nut, lugs for screw/nut, and screw connectors (for multi-pair feedthroughs).

T/C materials, governed by ANSI standards (and some non-standard materials), with suggested temperature ranges are shown in **Table 1**. But not all thermocouple materials are available in vacuum-feedthrough form.

In applications requiring precious metal T/Cs, the leads and feedthroughs of the same materials would be expensive. In practice, "compensating metal" wires are used from the ends of the true T/C wires, through the feedthrough, to the meter. NOTE: The temperature of the joint between true T/C wire and compensating wire must not exceed the value given in **Table 1**.

When selecting T/C feedthroughs, major considerations are the indicated temperature range, the number of temperature measurement locations, and the requirement of power conductors built into the same feedthrough.

Ceramic Breaks



Measuring Temperatures

Although well beyond the scope of these notes, it is important to realize that measuring temperatures with thermocouples in vacuum presents many under-appreciated difficulties. For example, just resting a T/C's junction on a polished silicon wafer mounted close to a heater gives **no** indication of the silicon's temperature. The silicon is almost 100% transparent in the IR energy spectrum. The recorded temperature is related to the emissivities of T/C and heater materials, the heater's temperature, the T/C's temperature, and their mutual "shape factor."

■ Ceramic Breaks

Occasionally, two parts of a vacuum vessel must be mechanically connected but electrically isolated. Flanged ceramic-metal vacuum breaks placed between these parts provide the necessary insulation.

Where an external part of the vessel is isolated from ground, yet needs a cryogenic liquid or (DI) water supply, narrow diameter ceramic-metal breaks with tube end terminations are used (mounted externally to the vessel).

If the isolated device is inside the vacuum housing, narrow diameter breaks are mounted inside the chamber (attached to normal liquid or cryogen feedthroughs through the wall, see Gas-Liquid Feedthroughs, **page 3-107**). Alternatively, for the latter application, power feedthroughs with tubular conductors are used (attached outside the vacuum vessel).

Ceramic-metal (vacuum) breaks are available in voltage ratings from 3kV to 40kV, either with weldable ends, KF, or CF flanges. Ceramic-metal (liquid) breaks have 3kV voltage ratings with tube or tube socket ends. When selecting an appropriate feedthrough, note the comments given in the sidebar (**opposite page**) titled Gas Discharges since they apply to this component, too.

Table 1: Thermocouple Feedthroughs

ANSI Type	Thermocouple Material		Temperature Range °C	Compensating Wire Junction
	Positive	Negative		
T	Copper	Constantan	-200 to 350	N/A
K	Chromel™	Alumel®	-200 to 1250	N/A
J	Iron	Constantan	0 to 750	N/A
S	Platinum/10% Rhodium	Platinum	0 to 1450	250° C
R	Platinum/13% Rhodium	Platinum	0 to 1450	250° C
C*	Tungsten/5% Rhenium	Tungsten/26% Rhenium	0 to 2315	250° C
E	Chromel	Constantan	-200 to 900	N/A
N*	Nicrosil	Nisil	-270 to 1300	N/A

*Non ANSI type

➤ Feedthroughs

■ Gas-Liquid Feedthroughs

These are mainly for delivering liquids or gases to a vacuum-mounted device, often to maintain the device's temperature or actuate some gas/liquid-driven rotor.

Standard flanges and baseplate ports have one or multiple tubes welded to through-holes, so the tubes extend out on both sides of the flange. The tubes have various diameters and are often terminated with a small flange or gas fitting, such as Swagelok® or Cajon®.

For multi-tube feedthroughs, certain combinations of tube diameter/numbers will not fit within certain flange's "free" area. In addition, the overall dimensions of some vacuum-side terminations may exceed the chamber port's bore. A matrix of compatible flange diameters, number and diameter of tubes, and terminations is given in the appropriate product segment.

Occasionally, gas-liquid feedthroughs connect to internal devices that are not at ground potential. For these applications, use electrically isolated power feedthroughs with tube conductors (see pages 3-10, 3-13, 3-14, 3-16, 3-19 to 3-22).

When choosing a gas-liquid feedthrough, the primary concerns are a flange that matches an existing (unused) flange on the chamber, the number of feedthrough tubes, the tube diameter, and tube terminations that either match existing components or suit the application.

■ Cryogen (LN₂) Feedthroughs

Cryogen feedthroughs are similar to Gas-Liquid feedthroughs except for a long thermal path between tube and flange. By using a thin gauge stainless steel and a long length joining flange and tube, heat transfer (and hence cryogen evaporation rate) is reduced.

■ Connectors and Cabling

Electrical and thermocouple feedthroughs have a variety of connector and cabling options. In addition to the obvious standard connectors, thermocouple extension wires, regular wires, and copper braids there are some less obvious but nevertheless useful vacuum mounted accessories:

- Ceramic beads and drilled disks for separating multiple bare conductors on the vacuum side of a feedthrough
- Ceramic "fish spine" beads for insulating single conductors, enabling flexibility yet giving protection against high voltage differential
- Metal "barrel connectors" that provide screw connections between plain wires ends



Gas-Liquid Feedthroughs

➤ Part Number Charts Explained

■ Part Numbers for Cables

Part No.	Specification	Code	Indicates
F T A	Feedthrough Accessory	—	—
x x x C B L	Cable	—	—
x x x x x N N	Cable Diameter	12 25	1/8" 1/4"
x x x x x x x N N	Terminations		
	End 1 & End 2 (See next table for explanation)	B C E F M	type B type C BNC MHV Microdot
x x x x x x x x x N N	Length	12 24 36	12" 24" 36"

■ Part Numbers for Ceramic Beads and Discs

Part No.	Specification	Code	Indicates
F T A	Feedthrough Accessories	—	—
x x x C E R	Ceramic Bead or Disc	—	—
x x x x x N	Material Code	B D	Bead Disc
x x x x x x N N N	I.D. (Beads) or Number of Holes (Disc)	—	—

■ Part Numbers for Ceramic Breaks

Part No.	Specification	Code	Indicates
C F T	Ceramic Break	—	Tubular Insulated Connection
x x x N N	Max. Voltage (kV)	—	—
x x x x x N	Type of Break	C V W	Cryo & Vacuum Vacuum Water & Vacuum
x x x x x x N N N	Tube End O.D.	—	Given as x.xx"
x x x x x x x x N N	Termination	—	Same as Power Feedthroughs

■ Inline-Barrel, Set-screw, and Push-on Connectors

Part No.	Specification	Code	Indicates
F T A	Feedthrough Accessory	—	—
x x x N N N	Description Code	IBC SSC PC TC	Inline-Barrel Connector Set-Screw Connector Push-On Connector Push-On Thermocouple
x x x x x x N N N	Barrel I.D. or Pin O.D.	—	Given as x.xx"
x x x x x x x x N N	Material Code	A C I CO	Alumel Chromel Iron Constantan

IN THIS SECTION ➤ Part Number Charts

The charts outline the system of Part Numbers. Each position in the Part Number provides information on the product's specifications or properties. Spaces designated "N" in this list are filled with a number or letter code explained at left. We can supply customers with configurations other than those listed (e.g., multiple feedthroughs mounted on the same flange). Please call for price and delivery on custom configurations.

■ Part Numbers for Connectors

Part No.	Specification	Code	Indicates
F T A	Feedthrough Accessory	—	—
x x x N N N	Description Code (Up to 6 Characters)	AMPH BNC HN MHV MICRO MIN N SMA SMB SHV-5 SHV-B SHV-20	Amphenol® BNC Type HN MHV Microdot (Miniature T/C) Type N SMA SMB SHV-5 SHV-Bakeable SHV-20
x x x x x N N	Number of Pins or Pairs	—	—
x x x x x x x N	Thermocouple Type	C E J K	—
x x x x x x x x x N N	Mil. Spec. (If Applicable)	—	—

■ Part Numbers for Thermocouple Feedthrough Probes

Part No.	Specification	Code	Indicates
T F P	Thermocouple Feedthrough Probe	—	Air-Side Connector
x x x N	Number of T/C Probes	Number	From 1-2 Probes (Custom Configurations Available)
x x x x N	T/C Type	E J K T N	Chromel:Constantan Fe: Constantan Chromel: Alumel® Cu/Constantan Nicrosil/Nisil
x x x x x N	T/C Connector Plug	Y	Miniature Style Plugs
x x x x x x N N	Sheath Material	SS IN	Stainless Steel Inconel
x x x x x x x x N N	Length (in.)	12	Vacuum Side Length (Custom Lengths Available)
x x x x x x x x x N N	Termination	—	Same as Power Feedthroughs

Part Number Charts Explained

Part Numbers for Power Feedthroughs

Part No.	Specification	Code	Indicates
E F T	Solid Conductors	—	—
F T T	Tubular Conductors	—	—
x x x N N	Maximum Voltage in kV	0 1 12	500V or Less, 1000V, 12,000, etc.
x x x x x N	Number of Conductors	Number V W	From 1–9 Conductors 10 12
x x x x x x N	Conductor Material:	1 2 3 4 5 6 7	Nickel Stainless Steel Copper Molybdenum Alumel [®] Constantan Kovar [®]
x x x x x x x N N	Conductor Diameter in 1/100"	—	—
x x x x x x x x N N	Termination	1 2 2A 3 3A 4 5 6 6A 6B 8 8A 8B 8C 8D 8E	Weldable 1 1/3" CF 2 1/8" CF 2 3/4" CF 3/8" CF 1" Baseplate Male Pipe Thread 4 1/2" CF 6" CF 8" CF QF16 QF25 QF40 QF50 ISO63 (Clamp Style) ISO 80 (Clamp Style)

Part Numbers for Thermocouples

Part No.	Specification	Code	Indicates
T F T	Single-End	—	Air-Side Connector
T F D	Double-End	—	Air- & Vac-Side Connectors
x x x N	Number of T/C Pairs	Number V	From 1–9 Conductors 10
x x x x N	T/C Type	C E J K R T N	W/5%Re: W26%Re Chromel: Constantan Fe: Constantan Chromel: Alumel [®] Pt/13%Rh: Pt Cu/Constantan Nicrosil/Nisil
x x x x x N	T/C Connector Plug	Y N A P	Miniature Style Plugs Wire Hooks Screw-Thread Plugs Push Pins (Connectors Not Included)
x x x x x x N	Number of Power Leads	0	If Not Applicable
x x x x x x x N	Power Conductor Material	C N 0	Copper Nickel If Not Applicable
x x x x x x x x N N	Max. Current (AMPs/Conductor)	0	If Not Applicable
x x x x x x x x x N N	Termination	—	Same as Power Feedthroughs

Part Numbers for Instrumentation Feedthroughs

Part No.	Specification	Code	Indicates
I F T	Single-End	—	Air-Side Connector
I F D	Double-End	—	Air- & Vac-Side Connectors
x x x N	Connector Type	A B C D E F G H J M N R S T V X Z	Amphenol [®] BNC SMA SMB Microdot High Voltage D-Subminiature HN C-Subminiature MHV Type N Round MPC SHV-5 SHV-B SHV-10 SHV-20 Triax
x x x x N	Shield Type	G F E	Grounded/Recessed Floating/Recessed Grounded/Exposed
x x x x x N N	Number of Conductors	Number	1 Through 50 Pins
x x x x x x x N	Conductor Material	—	Same as Power Feedthroughs
x x x x x x x x N N	Max. Current (AMPs/Conductor)	—	—
x x x x x x x x x N N	Termination	—	Same as Power Feedthroughs

Part Numbers for UHV Wires

Part No.	Indicates	Code	Indicates
F T A	Feedthrough Accessory	—	—
x x x W	Wire	—	—
x x x x L L	Description code	C CU E J K NI RS SS T	Type C Copper Type E Type J Type K Nickel Types R & S Stainless Steel Type T
x x x x x N N N	Size (inches and nominal)	—	—

Visit our website for information on Ceramaseal and ISI (Insulator Seal) Cross-Reference Charts at www.lesker.com/ft_oemref.cfm

➤ 50 & 500 Volts

IN THIS SECTION ➤

Power Feedthroughs

- These high-voltage, high-current electrical feedthroughs terminate in baseplates, weldable lips, CF flanges, KF flanges, and male pipe thread
- Constructed from vacuum-grade materials, including OFHC copper and nickel conductors, 304 stainless steel mounts, high-purity alumina ceramic insulation, and vacuum-tube grade braze alloys
- Units are designed and rated for high vacuum and UHV service

■ 1" Baseplate

Voltage: 50

Amperage: 400; 1,000

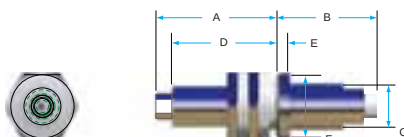


Figure 1 (solid conductor)

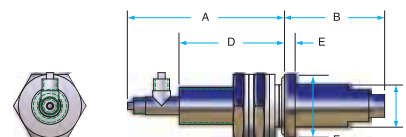


Figure 2 (water-cooled conductor)

Figure	Style	Material	Voltage	Amps/Pin	Dimensions (in.)						Part No.	Price
1	Solid Conductor	Copper	50V	400A	2.875	2.375	1.00	2.50	0.25	1.48	EFT0013754	Call
2	Water-Cooled Conductor	Copper	50V	1,000A	3.73	2.375	1.00	2.50	0.25	1.48	FTT0013754	Call

■ Weldable

Voltage: 500

Amperage: 1; 4; 8; 12

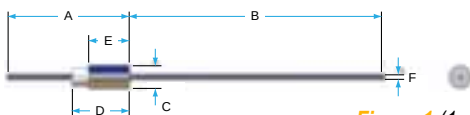


Figure 1 (1 pin or 1 tube)

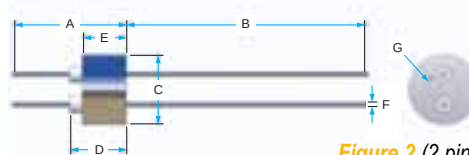


Figure 2 (2 pins or 2 tubes)

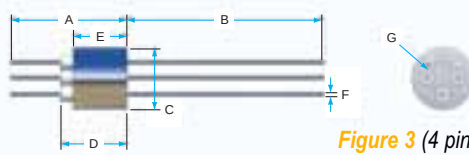


Figure 3 (4 pins or 4 tubes)

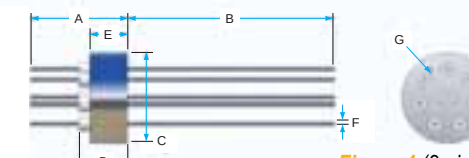


Figure 4 (8 pins or 8 tubes)

Figure	Pins or Tubes	# of Pins or Tubes	Conductor Material	Amps Per Pin/Tube	Dimensions (in.)							Part Number	Price
1	Pin	1	Nickel	4	1.10	1.40	0.154	0.53	0.27	0.032	N/A	EFT0011031	Call
1	Pin	1	Stainless Steel	<1	1.10	1.40	0.154	0.53	0.27	0.032	N/A	EFT0012031	Call
1	Pin	1	Copper	12	1.10	1.40	0.154	0.53	0.27	0.032	N/A	EFT0013031	Call
1	Pin	1	Molybdenum	8	1.10	1.40	0.154	0.53	0.27	0.032	N/A	EFT0014031	Call
2	Pin	2	Nickel	4	0.90	1.60	0.497	0.50	0.43	0.032	0.21	EFT0021031	Call
2	Pin	2	Stainless Steel	<1	0.90	1.60	0.497	0.50	0.43	0.032	0.21	EFT0022031	Call
2	Pin	2	Copper	12	0.90	1.60	0.497	0.50	0.43	0.032	0.21	EFT0023031	Call
2	Pin	2	Molybdenum	8	0.90	1.60	0.497	0.50	0.43	0.032	0.21	EFT0024031	Call
3	Pin	4	Nickel	4	0.93	1.57	0.497	0.53	0.43	0.032	0.25	EFT0041031	Call
3	Pin	4	Stainless Steel	<1	0.93	1.57	0.497	0.53	0.43	0.032	0.25	EFT0042031	Call
3	Pin	4	Copper	12	0.93	1.57	0.497	0.53	0.43	0.032	0.25	EFT0043031	Call
3	Pin	4	Molybdenum	8	0.93	1.57	0.497	0.53	0.43	0.032	0.25	EFT0044031	Call
4	Pin	8	Nickel	4	1.03	1.47	0.747	0.63	0.53	0.032	0.47	EFT0081031	Call
4	Pin	8	Stainless Steel	<1	1.03	1.47	0.747	0.63	0.53	0.032	0.47	EFT0082031	Call
4	Pin	8	Copper	12	1.03	1.47	0.747	0.63	0.53	0.032	0.47	EFT0083031	Call
4	Pin	8	Molybdenum	8	1.03	1.47	0.747	0.63	0.53	0.032	0.47	EFT0084031	Call

Refer to Connectors & Cabling, starting on page 3-113, for inline barrel connectors, set screw connectors, crimp/solder connectors, bare wire, wire beads, and ceramic wire discs.

➤ 500 Volts

■ CF Flanged Voltage: 500 Amperage: 1; 4; 8; 12

Figure	Flange Size	# of Pins	Conductor Material	Amps/ Pin	Dimensions (in.)								Part No.	Price
1	1.33" CF	2	Nickel	4	0.90	1.60	1.33	0.50	0.43	0.032	0.21		EFT0021032	Call
1	2.75" CF	2	Nickel	4	0.90	1.60	2.75	0.50	0.43	0.032	0.21		EFT0021033	Call
1	1.33" CF	2	Stainless Steel	<1	0.90	1.60	1.33	0.50	0.43	0.032	0.21		EFT0022032	Call
1	2.75" CF	2	Stainless Steel	<1	0.90	1.60	2.75	0.50	0.43	0.032	0.21		EFT0022033	Call
1	1.33" CF	2	Copper	12	0.90	1.60	1.33	0.50	0.43	0.032	0.21		EFT0023032	Call
1	2.75" CF	2	Copper	12	0.90	1.60	2.75	0.50	0.43	0.032	0.21		EFT0023033	Call
1	1.33" CF	2	Molybdenum	8	0.90	1.60	1.33	0.50	0.43	0.032	0.21		EFT0024032	Call
1	2.75" CF	2	Molybdenum	8	0.90	1.60	2.75	0.50	0.43	0.032	0.21		EFT0024033	Call
2	1.33" CF	4	Nickel	4	0.93	1.57	1.33	0.53	0.43	0.032	0.25		EFT0041032	Call
2	2.75" CF	4	Nickel	4	0.93	1.57	2.75	0.53	0.43	0.032	0.25		EFT0041033	Call
2	1.33" CF	4	Stainless Steel	<1	0.93	1.57	1.33	0.53	0.43	0.032	0.25		EFT0042032	Call
2	2.75" CF	4	Stainless Steel	<1	0.93	1.57	2.75	0.53	0.43	0.032	0.25		EFT0042033	Call
2	1.33" CF	4	Copper	12	0.93	1.57	1.33	0.53	0.43	0.032	0.25		EFT0043032	Call
2	2.75" CF	4	Copper	12	0.93	1.57	2.75	0.53	0.43	0.032	0.25		EFT0043033	Call
2	1.33" CF	4	Molybdenum	8	0.93	1.57	1.33	0.53	0.43	0.032	0.25		EFT0044032	Call
2	2.75" CF	4	Molybdenum	8	0.93	1.57	2.75	0.53	0.43	0.032	0.25		EFT0044033	Call
3	1.33" CF	8	Nickel	4	1.53	0.97	1.33	1.13	1.03	0.032	0.47		EFT0081032	Call
3	2.75" CF	8	Nickel	4	1.03	1.47	2.75	0.63	0.53	0.032	0.47		EFT0081033	Call
3	1.33" CF	8	Stainless Steel	<1	1.53	0.97	1.33	1.13	1.03	0.032	0.47		EFT0082032	Call
3	2.75" CF	8	Stainless Steel	<1	1.03	1.47	2.75	0.63	0.53	0.032	0.47		EFT0082033	Call
3	1.33" CF	8	Copper	12	1.53	0.97	1.33	1.13	1.03	0.032	0.47		EFT0083032	Call
3	1.33" CF	8	Molybdenum	8	1.53	0.97	1.33	1.13	1.03	0.032	0.47		EFT0084032	Call
3	2.75" CF	8	Molybdenum	8	1.03	1.47	2.75	0.63	0.53	0.032	0.47		EFT0084033	Call

Refer to Connectors & Cabling, starting on page 3-113, for inline barrel connectors, set screw connectors, crimp/solder connectors, bare wire, wire beads, and ceramic wire discs.

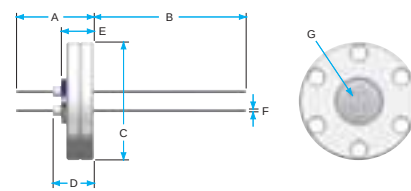


Figure 1 (2 pins)

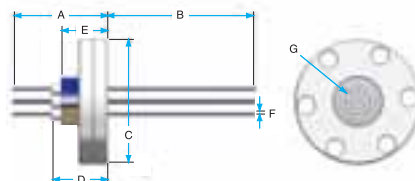


Figure 2 (4 pins)

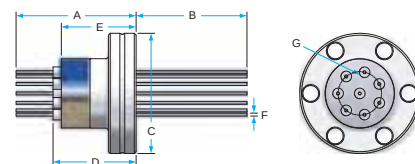


Figure 3 (8 pins)

■ KF (QF) Flanged Voltage: 500 Amperage: 1; 4; 8; 12

Figure	Flange Size	# of Pins	Conductor Material	Amps/ Pin or Tube	Dimensions (in.)								Part No.	Price
1	KF16	2	Nickel	4	0.90	1.60	1.18	0.50	0.43	0.032	0.21		EFT0021038	Call
1	KF25	2	Nickel	4	0.90	1.60	1.57	0.50	0.43	0.032	0.21		EFT0021038A	Call
1	KF40	2	Nickel	4	0.90	1.60	2.16	0.50	0.43	0.032	0.21		EFT0021038B	Call
1	KF16	2	Stainless Steel	<1	0.90	1.60	1.18	0.50	0.43	0.032	0.21		EFT0022038	Call
1	KF40	2	Stainless Steel	<1	0.90	1.60	2.16	0.50	0.43	0.032	0.21		EFT0022038B	Call
1	KF16	2	Copper	12	0.90	1.60	1.18	0.50	0.43	0.032	0.21		EFT0023038	Call
1	KF40	2	Copper	12	0.90	1.60	2.16	0.50	0.43	0.032	0.21		EFT0023038B	Call
1	KF16	2	Molybdenum	8	0.90	1.60	1.18	0.50	0.43	0.032	0.21		EFT0024038	Call
1	KF25	2	Molybdenum	8	0.90	1.60	1.57	0.50	0.43	0.032	0.21		EFT0024038A	Call
1	KF40	2	Molybdenum	8	0.90	1.60	2.16	0.50	0.43	0.032	0.21		EFT0024038B	Call
2	KF16	4	Nickel	4	0.93	1.57	1.18	0.53	0.43	0.032	0.25		EFT0041038	Call
2	KF40	4	Nickel	4	0.93	1.57	2.16	0.53	0.43	0.032	0.25		EFT0041038B	Call
2	KF16	4	Stainless Steel	<1	0.93	1.57	1.18	0.53	0.43	0.032	0.25		EFT0042038	Call
2	KF40	4	Stainless Steel	<1	0.93	1.57	2.16	0.53	0.43	0.032	0.25		EFT0042038B	Call
2	KF16	4	Copper	12	0.93	1.57	1.18	0.53	0.43	0.032	0.25		EFT0043038	Call
2	KF25	4	Copper	12	0.93	1.57	1.57	0.53	0.43	0.032	0.25		EFT0043038A	Call
2	KF40	4	Copper	12	0.93	1.57	2.16	0.53	0.43	0.032	0.25		EFT0043038B	Call
2	KF16	4	Molybdenum	8	0.93	1.57	1.18	0.53	0.43	0.032	0.25		EFT0044038	Call
2	KF25	4	Molybdenum	8	0.93	1.57	1.57	0.53	0.43	0.032	0.25		EFT0044038A	Call
2	KF40	4	Molybdenum	8	0.93	1.57	2.16	0.53	0.43	0.032	0.25		EFT0044038B	Call
3	KF16	8	Nickel	4	1.03	1.47	1.18	0.63	0.53	0.032	0.47		EFT0081038	Call
3	KF25	8	Nickel	4	1.03	1.47	1.57	0.63	0.53	0.032	0.47		EFT0081038A	Call
3	KF40	8	Nickel	4	1.03	1.47	2.16	0.63	0.53	0.032	0.47		EFT0081038B	Call
3	KF50	8	Nickel	4	1.03	1.47	2.95	0.63	0.53	0.032	0.47		EFT0081038C	Call
3	KF16	8	Stainless Steel	<1	1.03	1.47	1.18	0.63	0.53	0.032	0.47		EFT0082038	Call
3	KF40	8	Stainless Steel	<1	1.03	1.47	2.16	0.63	0.53	0.032	0.47		EFT0082038B	Call
3	KF25	8	Copper	12	1.03	1.47	1.57	0.63	0.53	0.032	0.47		EFT0083038A	Call
3	KF40	8	Copper	12	1.03	1.47	2.16	0.63	0.53	0.032	0.47		EFT0083038B	Call
3	KF50	8	Copper	12	1.03	1.47	2.95	0.63	0.53	0.032	0.47		EFT0083038C	Call
3	KF16	8	Molybdenum	8	1.03	1.47	1.18	0.63	0.53	0.032	0.47		EFT0084038	Call
3	KF25	8	Molybdenum	8	1.03	1.47	1.57	0.63	0.53	0.032	0.47		EFT0084038A	Call
3	KF40	8	Molybdenum	8	1.03	1.47	2.16	0.63	0.53	0.032	0.47		EFT0084038B	Call

Refer to Connectors & Cabling, starting on page 3-113, for inline barrel connectors, set screw connectors, crimp/solder connectors, bare wire, wire beads, and ceramic wire discs.

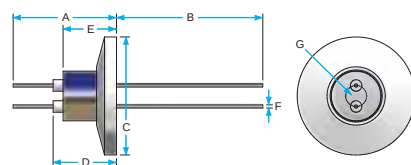


Figure 1 (2 pins)

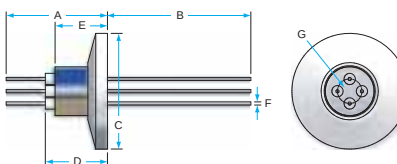


Figure 2 (4 pins)

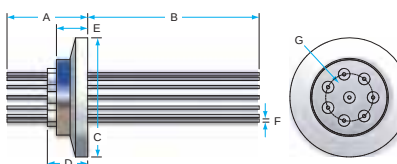


Figure 3 (8 pins)

➤ **1,000 Volts**

■ **Weldable**

Voltage: 1,000

Amperage: 1; 7; 20

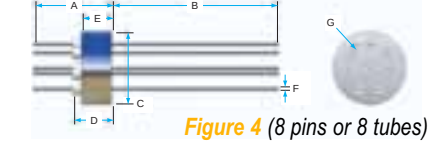
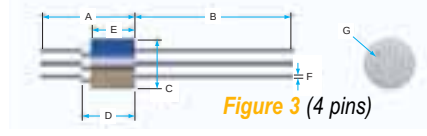
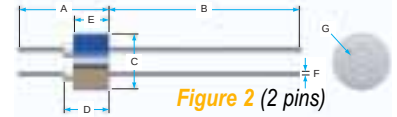
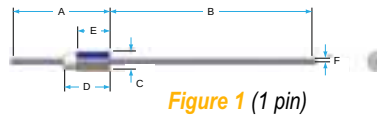


Figure	Pins or Tubes	# of Pins or Tubes	Conductor Material	Amps Per Pin/Tube	Dimensions (in.)								Part Number	Price
1	Pin	1	Nickel	7	1.80	2.20	0.247	0.80	0.37	0.05	N/A		EFT0111051	Call
1	Pin	1	Stainless Steel	1	1.80	2.20	0.247	0.80	0.37	0.05	N/A		EFT01112051	Call
1	Pin	1	Copper	20	1.80	2.20	0.247	0.80	0.37	0.05	N/A		EFT0113051	Call
2	Pin	2	Nickel	7	2.10	1.90	0.747	0.70	0.53	0.05	0.31		EFT0121051	Call
2	Pin	2	Stainless Steel	1	2.10	1.90	0.747	0.70	0.53	0.05	0.31		EFT0122051	Call
2	Pin	2	Copper	20	2.10	1.90	0.747	0.70	0.53	0.05	0.31		EFT0123051	Call
3	Pin	4	Nickel	7	2.13	1.87	0.747	0.67	0.53	0.05	0.38		EFT0141051	Call
3	Pin	4	Stainless Steel	1	2.13	1.87	0.747	0.67	0.53	0.05	0.38		EFT0142051	Call
3	Pin	4	Copper	20	2.13	1.87	0.747	0.67	0.53	0.05	0.38		EFT0143051	Call
4	Pin	8	Copper	20	2.13	1.87	0.747	0.67	0.53	0.05	0.38		EFT0183051	Call
4	Pin	8	Kovar®	7	2.13	1.87	0.747	0.67	0.53	0.05	0.38		EFT0187051	Call

Refer to Connectors & Cabling, starting on page 3-113, for inline barrel connectors, set screw connectors, crimp/solder connectors, bare wire, wire beads, and ceramic wire discs.

■ **CF Flanged**

Voltage: 1,000

Amperage: 1; 7; 20

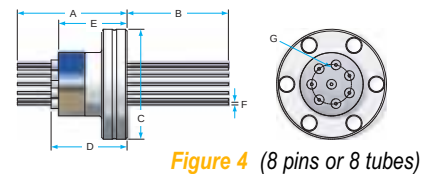
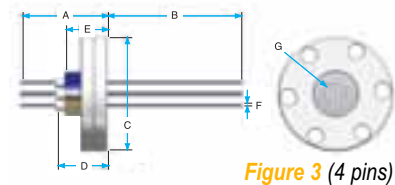
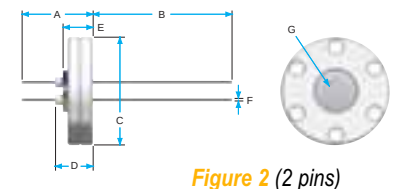
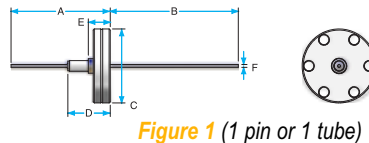


Figure	Pins or Tubes	# of Pins or Tubes	Conductor Material	Flange Size	Amps Per Pin/Tube	Dimensions (in.)								Part Number	Price
1	Pin	1	Stainless Steel	1.33" CF	1	1.80	2.20	1.33	0.80	0.37	0.05	N/A		EFT0112052	Call
1	Pin	1	Copper	1.33" CF	20	1.80	2.20	1.33	0.80	0.37	0.05	N/A		EFT0113052	Call
1	Pin	1	Copper	2.75" CF	20	1.80	2.20	2.75	0.80	0.37	0.05	N/A		EFT0113053	Call
2	Pin	2	Nickel	1.33" CF	7	2.60	1.40	1.33	1.20	1.03	0.05	0.31		EFT0121052	Call
2	Pin	2	Nickel	2.75" CF	7	2.10	1.90	2.75	0.70	0.53	0.05	0.31		EFT0121053	Call
2	Pin	2	Stainless Steel	1.33" CF	1	2.60	1.40	1.33	1.20	1.03	0.05	0.31		EFT0122052	Call
2	Pin	2	Stainless Steel	2.75" CF	1	2.10	1.90	2.75	0.70	0.53	0.05	0.31		EFT0122053	Call
2	Pin	2	Copper	1.33" CF	20	2.60	1.40	1.33	1.20	1.03	0.05	0.31		EFT0123052	Call
2	Pin	2	Copper	2.75" CF	20	2.10	1.90	2.75	0.70	0.53	0.05	0.31		EFT0123053	Call
3	Pin	4	Nickel	1.33" CF	7	2.63	1.27	1.33	1.17	1.03	0.05	0.38		EFT0141052	Call
3	Pin	4	Nickel	2.75" CF	7	2.13	1.87	2.75	0.67	0.53	0.05	0.38		EFT0141053	Call
3	Pin	4	Stainless Steel	1.33" CF	1	2.63	1.27	1.33	1.17	1.03	0.05	0.38		EFT0142052	Call
3	Pin	4	Stainless Steel	2.75" CF	1	2.13	1.87	2.75	0.67	0.53	0.05	0.38		EFT0142053	Call
3	Pin	4	Copper	1.33" CF	20	2.63	1.27	1.33	1.17	1.03	0.05	0.38		EFT0143052	Call
3	Pin	4	Copper	2.75" CF	20	2.13	1.87	2.75	0.67	0.53	0.05	0.38		EFT0143053	Call
4	Pin	8	Kovar	1.33" CF	7	2.63	1.37	1.33	1.17	1.03	0.05	0.43		EFT0187052	Call
4	Pin	8	Kovar	2.75" CF	7	2.13	1.87	2.75	0.67	0.53	0.05	0.43		EFT0187053	Call

Refer to Connectors & Cabling, starting on page 3-113, for inline barrel connectors, set screw connectors, crimp/solder connectors, bare wire, wire beads, and ceramic wire discs.

➤ 1,000 Volts

■ KF (QF) Flanged

Voltage: 1,000

Amperage: 1; 7; 20

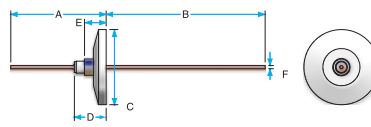


Figure 1 (1 pin)

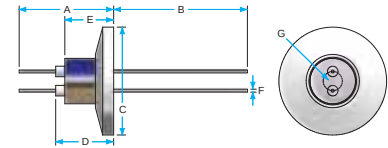


Figure 2 (2 pins)

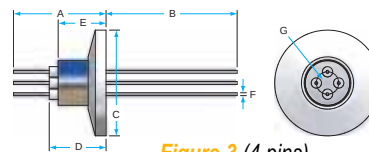


Figure 3 (4 pins)

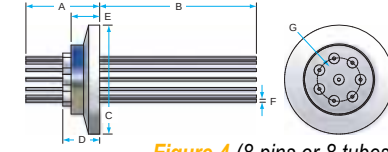


Figure 4 (8 pins or 8 tubes)

	Pins or Figure Tubes	# of Pins or Tubes	Conductor Material	Flange Size	Amps Per Pin/Tube	Dimensions (in.)								Part No.	Price
						A	B	C	D	E	F	G			
1	Pin	1	Nickel	KF25	7	1.80	2.20	1.18	0.80	0.37	0.05	N/A	EFT0111058A	Call	
1	Pin	1	Copper	KF16	20	1.80	2.20	1.18	0.80	0.37	0.05	N/A	EFT0113058	Call	
2	Pin	2	Nickel	KF16	7	2.10	1.90	1.18	0.70	0.53	0.05	0.31	EFT0121058	Call	
2	Pin	2	Nickel	KF40	7	2.10	1.90	2.16	0.70	0.53	0.05	0.31	EFT0121058B	Call	
2	Pin	2	Stainless Steel	KF16	1	2.10	1.90	1.18	0.70	0.53	0.05	0.31	EFT0122058	Call	
2	Pin	2	Stainless Steel	KF40	1	2.10	1.90	2.16	0.70	0.53	0.05	0.31	EFT0122058B	Call	
2	Pin	2	Copper	KF16	20	2.10	1.90	1.18	0.70	0.53	0.05	0.31	EFT0123058	Call	
2	Pin	2	Copper	KF25	20	2.10	1.90	1.57	0.70	0.53	0.05	0.31	EFT0123058A	Call	
2	Pin	2	Copper	KF40	20	2.10	1.90	2.16	0.70	0.53	0.05	0.31	EFT0123058B	Call	
3	Pin	4	Nickel	KF16	7	2.13	1.87	1.18	0.67	0.53	0.05	0.38	EFT0141058	Call	
3	Pin	4	Nickel	KF25	7	2.13	1.87	1.57	0.67	0.53	0.05	0.38	EFT0141058A	Call	
3	Pin	4	Nickel	KF40	7	2.13	1.87	2.16	0.67	0.53	0.05	0.38	EFT0141058B	Call	
3	Pin	4	Stainless Steel	KF16	1	2.13	1.87	1.18	0.67	0.53	0.05	0.38	EFT0142058	Call	
3	Pin	4	Stainless Steel	KF25	1	2.13	1.87	1.57	0.67	0.53	0.05	0.38	EFT0142058A	Call	
3	Pin	4	Stainless Steel	KF40	1	2.13	1.87	2.16	0.67	0.53	0.05	0.38	EFT0142058B	Call	
3	Pin	4	Copper	KF16	20	2.13	1.87	1.18	0.67	0.53	0.05	0.38	EFT0143058	Call	
3	Pin	4	Copper	KF25	20	2.13	1.87	1.57	0.67	0.53	0.05	0.38	EFT0143058A	Call	
3	Pin	4	Copper	KF40	20	2.13	1.87	2.16	0.67	0.53	0.05	0.38	EFT0143058B	Call	
3	Pin	4	Copper	KF50	20	2.13	1.87	2.95	0.67	0.53	0.05	0.38	EFT0143058C	Call	
4	Pin	8	Kovar®	KF16	7	2.13	1.87	1.18	0.67	0.53	0.05	0.43	EFT0187058	Call	
4	Pin	8	Kovar	KF25	7	2.13	1.87	1.57	0.67	0.53	0.05	0.43	EFT0187058A	Call	
4	Pin	8	Kovar	KF40	7	2.13	1.87	2.16	0.67	0.53	0.05	0.43	EFT0187058B	Call	

Refer to Connectors & Cabling, starting on page 3-113, for inline barrel connectors, set screw connectors, crimp/solder connectors, bare wire, wire beads, and ceramic wire discs.

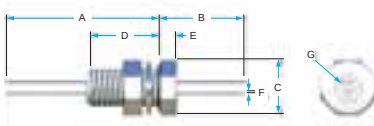
■ Baseplate Voltage: 1,000
Amperage: 1; 5; 7; 15

Figure 1 (2 pin)

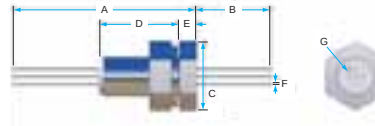


Figure 2 (4 pins)

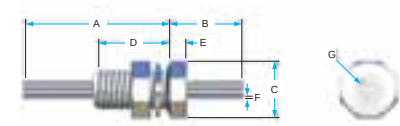


Figure 3 (8 pins or 8 tubes)

Figure	# of	Conductor Pins or Tubes	Conductor			Amps/Pin	Dimensions							Part No.	Price
	Conductors		Material	Mounting	A		B	C	D	E	F	G			
1	2	Pin	Nickel	1" BP	5	4.18	2.32	1.50	1.88	0.44	0.05	0.31	EFT0121054	Call	
1	2	Pin	Stainless Steel	1" BP	1	4.18	2.32	1.50	1.88	0.44	0.05	0.31	EFT0122054	Call	
1	2	Pin	Copper	1" BP	15	4.18	2.32	1.50	1.88	0.44	0.05	0.31	EFT0123054	Call	
2	4	Pin	Nickel	1" BP	5	4.18	2.32	1.50	1.88	0.44	0.05	0.38	EFT0141054	Call	
2	4	Pin	Stainless Steel	1" BP	1	4.18	2.32	1.50	1.88	0.44	0.05	0.38	EFT0142054	Call	
2	4	Pin	Copper	1" BP	15	4.18	2.32	1.50	1.88	0.44	0.05	0.38	EFT0143054	Call	
3	8	Pin	Kovar	1" BP	7	3.83	1.92	1.50	1.88	0.44	0.05	0.43	EFT0187054	Call	
3	8	Tube	Nickel	1" BP	5	3.83	1.92	1.50	1.88	0.44	0.05	0.43	FTT0181054	Call	
3	8	Tube	Stainless Steel	1" BP	1	3.83	1.92	1.50	1.88	0.44	0.05	0.43	FTT0182054	Call	

Refer to Connectors & Cabling, starting on page 3-113, for inline barrel connectors, set screw connectors, crimp/solder connectors, bare wire, wire beads, and ceramic wire discs.

■ **Weldable**

Voltage: 2,000

Amperage: 10



3

Feedthroughs

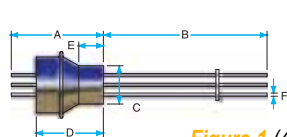


Figure 1 (4 pins)

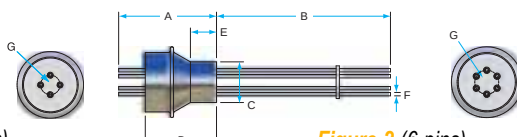


Figure 2 (6 pins)

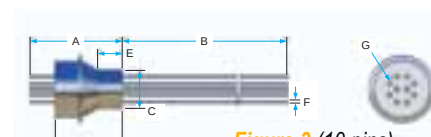


Figure 3 (10 pins)

Figure	# of Pins	Material	Amps/Pin	Dimensions (in.)								Part No.	Price
				A	B	C	D	E	F	G			
1	4	Alumel®	10	1.80	3.20	0.747	1.31	0.50	0.062	0.38		EFT0245061	Call
2	6	Alumel	10	1.80	3.20	0.747	1.31	0.50	0.062	0.44		EFT0265061	Call
3	10	Alumel	10	2.05	3.20	0.747	1.43	0.46	0.056	0.51		EFT02V5061	Call

Refer to Connectors & Cabling, starting on page 3-113, for inline barrel connectors, set screw connectors, crimp/solder connectors, bare wire, wire beads, and ceramic wire discs.

■ **CF Flanged**

Voltage: 2,000

Amperage: 10

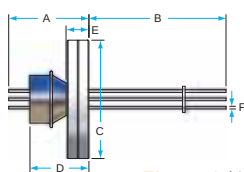


Figure 1 (4 pins)

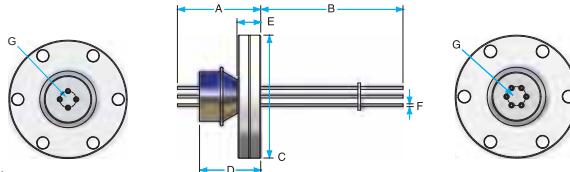


Figure 2 (6 pins)

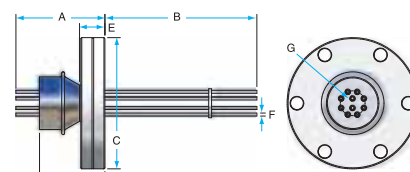


Figure 3 (10 pins)

Figure	# of Pins	Conductor Material	Flange Size	Amps/Pin	Dimensions (in.)								Part No.	Price
					A	B	C	D	E	F	G			
1	4	Alumel	1.33" CF	10	2.30	2.70	1.33	1.81	1.00	0.062	0.38		EFT0245062	Call
1	4	Alumel	2.75" CF	10	1.80	3.20	2.75	1.31	0.50	0.062	0.38		EFT0245063	Call
2	6	Alumel	1.33" CF	10	2.30	2.70	1.33	1.81	1.00	0.062	0.44		EFT0265062	Call
2	6	Alumel	2.75" CF	10	1.80	3.20	2.75	1.31	0.50	0.062	0.44		EFT0265063	Call
3	10	Alumel	1.33" CF	10	2.55	2.70	1.33	1.93	0.96	0.056	0.51		EFT02V5062	Call
3	10	Alumel	2.75" CF	10	2.05	3.20	2.75	1.43	0.46	0.056	0.51		EFT02V5063	Call

Refer to Connectors & Cabling, starting on page 3-113, for inline barrel connectors, set screw connectors, crimp/solder connectors, bare wire, wire beads, and ceramic wire discs.

➤ 2,000 Volts

■ KF (QF) Flanged

Voltage: 2,000

Amperage: 10

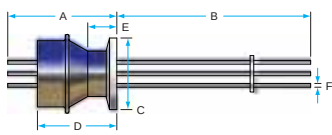


Figure 1 (4 pins)

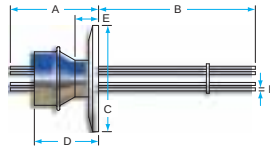


Figure 2 (6 pins)

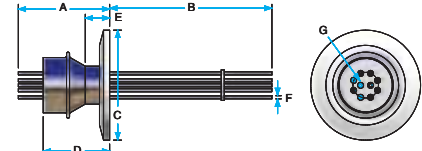


Figure 3 (10 pins)

Figure	Flange Size	# of Pins	Material	Amps/Pin	Dimensions (in.)								Part No.	Price
1	KF16	4	Alumel®	10	1.80	3.20	1.18	1.31	0.50	0.062	0.38		EFT0245068	Call
1	KF40	4	Alumel	10	1.80	3.20	2.16	1.31	0.50	0.062	0.38		EFT0245068B	Call
2	KF16	6	Alumel	10	1.80	3.20	1.18	1.31	0.50	0.062	0.44		EFT0265068	Call
2	KF25	6	Alumel	10	1.80	3.20	1.57	1.31	0.50	0.062	0.44		EFT0265068A	Call
2	KF40	6	Alumel	10	1.80	3.20	2.16	1.31	0.50	0.062	0.44		EFT0265068B	Call
3	KF16	10	Alumel	10	2.05	3.20	1.18	1.43	0.46	0.056	0.51		EFT02V5068	Call
3	KF25	10	Alumel	10	2.05	3.20	1.57	1.43	0.46	0.056	0.51		EFT02V5068A	Call
3	KF40	10	Alumel	10	2.05	3.20	2.16	1.43	0.46	0.056	0.51		EFT02V5068B	Call

Refer to Connectors & Cabling, starting on page 3-113, for inline barrel connectors, set screw connectors, crimp/solder connectors, bare wire, wire beads, and ceramic wire discs.

■ Baseplate

Voltage: 2,000

Amperage: 15; 30

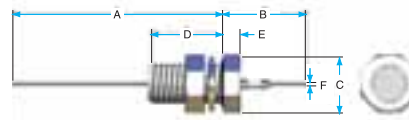


Figure 1 (1 pin)

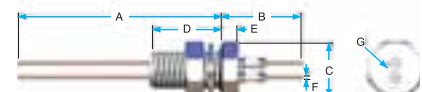


Figure 2 (2 pins)

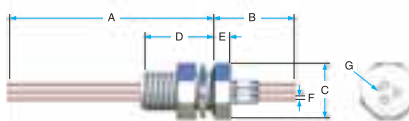


Figure 3 (3 pins)

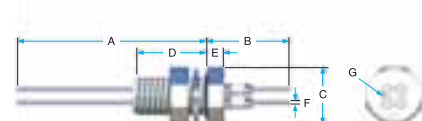


Figure 4 (4 pins)

Figure	Conductors	Conductor Material	Mounting	Amps/Pin	Dimensions (in.)								Part Number	Price
1	1	Copper	1" BP	30	5.60	2.20	1.50	1.90	0.44	0.094	N/A		EFT0213094	Call
2	2	Copper	1" BP	30	5.08	2.17	1.50	1.88	0.44	0.094	0.38		EFT0223094	Call
3	3	Copper	1" BP	30	5.08	2.17	1.50	1.88	0.44	0.094	0.45		EFT0233094	Call
4	4	Nickel	1" BP	15	5.08	2.17	1.50	1.88	0.44	0.092	0.51		EFT0241094	Call
4	4	Copper	1" BP	15	4.90	2.10	1.50	1.90	0.44	0.05	0.39		EFT0243054	Call
4	4	Copper	1" BP	30	5.08	2.17	1.50	1.88	0.44	0.094	0.51		EFT0243094	Call

Refer to Connectors & Cabling, starting on page 3-113, for inline barrel connectors, set screw connectors, crimp/solder connectors, bare wire, wire beads, and ceramic wire discs.

■ NPT (Male)

Voltage: 2,000

Amperage: 10

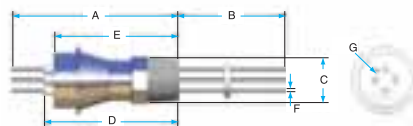


Figure 1 (4 pins)

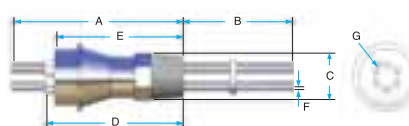


Figure 2 (6 pins)

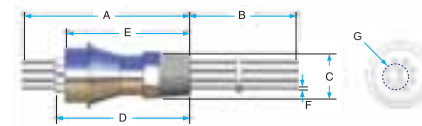


Figure 3 (10 pins)

Figure	# of Pins	Conductor Material	Mounting	Amps/Pin	Dimensions (in.)								Part Number	Price
1	4	Alumel®	1/2" NPT	10	3.19	2.06	0.87	2.57	2.38	0.056	0.38		EFT0245065	Call
2	6	Alumel	1/2" NPT	10	3.19	2.06	0.87	2.57	2.38	0.056	0.44		EFT0265065	Call
3	10	Alumel	1/2" NPT	10	3.19	2.06	0.87	2.57	2.38	0.056	0.51		EFT02V5065	Call

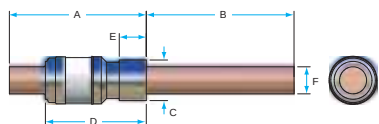
Refer to Connectors & Cabling, starting on page 3-113, for inline barrel connectors, set screw connectors, crimp/solder connectors, bare wire, wire beads, and ceramic wire discs.

➤ **3,000 Volts**

■ **Weldable**

Voltage: 3,000

Amperage: 12; 125; 250; 600



Pins or Tubes	# of Pins or Tubes	Conductor Material	Amps Per Pin/Tube	Dimensions (in.)						Part No.	Price
				A	B	C	D	E	F		
Pin	1	Nickel	125	3.10	4.20	0.747	2.10	0.75	0.375	EFT0311371	Call
Pin	1	Stainless Steel	12	3.85	3.40	1.12	2.85	0.75	0.75	EFT0312751	Call
Pin	1	Copper	250	3.15	4.10	0.747	2.15	0.75	0.375	EFT0313371	Call
Tube	1	Copper	250	3.15	4.10	0.747	2.15	0.75	0.375	FTT0313371	Call
Pin	1	Copper	600	3.85	3.40	1.12	2.85	0.75	0.75	EFT0313751	Call
Tube	1	Copper	600	3.80	4.10	1.125	2.80	0.75	0.75	FTT0313751	Call

Refer to Connectors & Cabling, starting on page 3-113, for bare wire.

■ **CF Flanged**

Voltage: 3,000

Amperage: 125; 250; 600

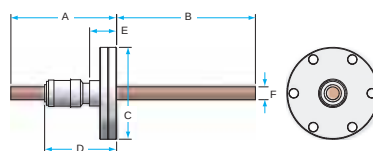


Figure 1 (1 pin or 1 tube)

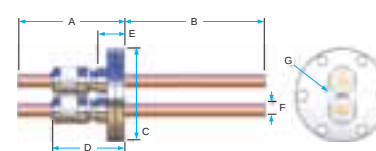


Figure 2 (2 pins)

Figure	Pins or Tubes	# of Pins or Tubes	Conductor Material	Flange Size	Amps Per Pin/Tube	Dimensions (in.)								Part Number	Price
						A	B	C	D	E	F	G			
1	Pin	1	Nickel	1.33" CF	125	3.60	3.70	1.33	2.60	1.25	0.375	N/A	EFT0311372	Call	
1	Pin	1	Copper	1.33" CF	250	3.65	3.60	1.33	2.65	1.25	0.375	N/A	EFT0313372	Call	
1	Tube	1	Copper	1.33" CF	250	3.65	3.60	1.33	2.65	1.25	0.375	N/A	FTT0313372	Call	
1	Pin	1	Copper	2.75" CF	250	3.15	4.10	2.75	2.15	0.75	0.375	N/A	EFT0313373	Call	
1	Tube	1	Copper	2.75" CF	250	3.15	4.10	2.75	2.15	0.75	0.375	N/A	FTT0313373	Call	
1	Pin	1	Copper	2.75" CF	600	3.85	3.40	2.75	2.85	0.75	0.75	N/A	EFT0313753	Call	
1	Tube	1	Copper	2.75" CF	600	3.80	4.10	2.75	2.80	0.75	0.75	N/A	FTT0313753	Call	
2	Pin	2	Copper	2.75" CF	250	2.90	4.40	2.75	1.90	0.75	0.375	0.93	EFT0323373	Call	

Refer to Connectors & Cabling, starting on page 3-113, for bare wire.

■ **KF (QF) Flanged**

Voltage: 3,000

Amperage: 250; 600

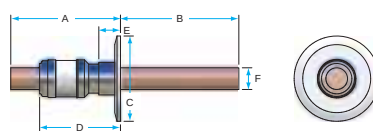


Figure 1 (1 pin or 1 tube)

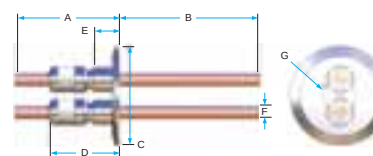


Figure 2 (2 pins or 2 tubes)

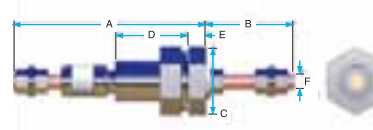
Figure	Pins or Tubes	# of Pins or Tubes	Conductor Material	Flange Size	Amps Per Pin/Tube	Dimensions (in.)								Part No.	Price
						A	B	C	D	E	F	G			
1	Pin	1	Copper	KF16	250	3.15	4.10	1.18	2.15	0.75	0.375	N/A	EFT0313378	Call	
1	Tube	1	Copper	KF16	250	3.15	4.10	1.18	2.15	0.75	0.375	N/A	FTT0313378	Call	
1	Pin	1	Copper	KF25	250	3.15	4.10	1.57	2.15	0.75	0.375	N/A	EFT0313378A	Call	
1	Pin	1	Copper	KF40	250	3.15	4.10	2.16	2.15	0.75	0.375	N/A	EFT0313378B	Call	
1	Tube	1	Copper	KF40	250	3.15	4.10	2.16	2.15	0.75	0.375	N/A	FTT0313378B	Call	
1	Pin	1	Copper	KF40	600	3.85	3.40	2.16	2.85	0.75	0.75	N/A	EFT0313758B	Call	
1	Tube	1	Copper	KF40	600	3.80	4.10	2.16	2.80	0.75	0.75	N/A	FTT0313758B	Call	
1	Pin	1	Copper	KF50	600	3.85	3.40	2.95	2.85	0.75	0.75	N/A	EFT0313758C	Call	
2	Pin	2	Copper	KF50	250	3.15	4.10	2.95	2.15	0.75	0.375	0.95	EFT0323378C	Call	
2	Tube	2	Copper	KF50	250	3.15	4.10	2.95	2.15	0.75	0.375	0.95	FTT0323378C	Call	

Refer to Connectors & Cabling, starting on page 3-113, for bare wire.

■ **1" Baseplate**

Voltage: 3,000

Amperage: 250



# of Pins	Conductor		Mounting	Amps/Pin	Threads	Dimensions (in.)						Part Number	Price
	Material					A	B	C	D	E	F		
1	Copper		1" BP	250	3/8-16 Both Sides	4.53	2.72	1.50	1.88	0.44	0.375	EFT0313374	Call

Refer to Connectors & Cabling, starting on page 3-113, for bare wire.

3

Feedthroughs

➤ 5,000 Volts

■ Weldable

Voltage: 5,000

Amperage: 1; 2; 5; 7; 15; 30; 60; 75; 150

3

Feedthroughs

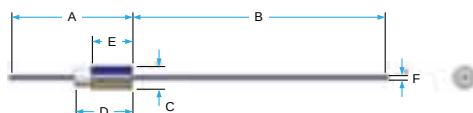


Figure 1 (1 pin or 1 tube)

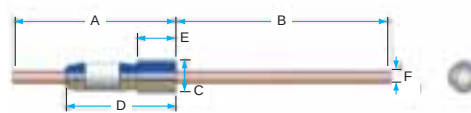


Figure 1B (1 pin or 1 tube)

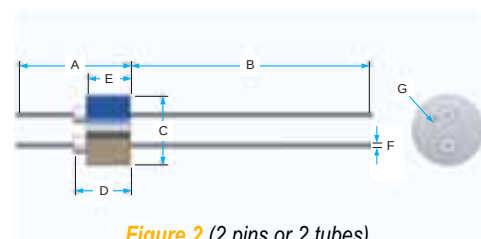


Figure 2 (2 pins or 2 tubes)

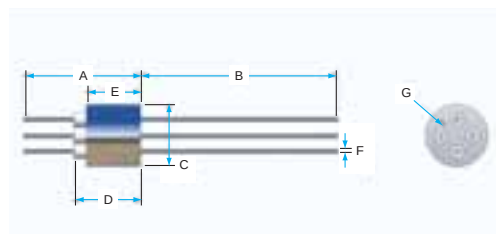


Figure 3 (4 pins or 4 tubes)

Figure	Pins or Tubes	# of Pins or Tubes	Conductor Material	Amps Per Pin/Tube	Dimensions (in.)							Part Number	Price
1	Pin	1	Nickel	5	1.85	2.15	0.247	0.85	0.37	0.05	N/A	EFT0511051	Call
1	Pin	1	Stainless Steel	1	1.85	2.15	0.247	0.85	0.37	0.05	N/A	EFT0512051	Call
1	Pin	1	Copper	15	1.85	2.15	0.247	0.85	0.37	0.05	N/A	EFT0513051	Call
1	Pin	1	Nickel	15	2.30	5.00	0.435	1.20	0.50	0.094	N/A	EFT0511091	Call
1	Pin	1	Stainless Steel	2	2.30	5.00	0.435	1.20	0.50	0.094	N/A	EFT0512091	Call
1	Pin	1	Copper	30	2.30	5.00	0.435	1.20	0.50	0.094	N/A	EFT0513091	Call
1B	Pin	1	Nickel	30	2.30	4.9	0.495	1.40	0.50	0.154	N/A	EFT0511151	Call
1B	Pin	1	Nickel	75	3.13	4.12	0.622	2.13	0.75	0.25	N/A	EFT0511251	Call
1B	Tube	1	Nickel	75	3.13	4.12	0.622	2.13	0.75	0.25	N/A	FTT0511251	Call
1B	Pin	1	Stainless Steel	7	3.13	4.12	0.622	2.13	0.75	0.25	N/A	EFT0512251	Call
1B	Tube	1	Stainless Steel	7	3.13	4.12	0.622	2.13	0.75	0.25	N/A	FTT0512251	Call
1B	Pin	1	Copper	60	2.32	2.61	0.495	1.32	0.50	0.154	N/A	EFT0513151	Call
1B	Pin	1	Copper	150	3.13	4.12	0.622	2.13	0.75	0.25	N/A	EFT0513251	Call
1B	Tube	1	Copper	150	3.13	4.12	0.622	2.13	0.75	0.25	N/A	FTT0513251	Call
2	Pin	2	Nickel	5	1.87	2.13	0.747	0.87	0.38	0.05	0.31	EFT0521051	Call
2	Pin	2	Stainless Steel	1	1.87	2.13	0.747	0.87	0.38	0.05	0.31	EFT0522051	Call
2	Pin	2	Copper	15	1.87	2.13	0.747	0.87	0.38	0.05	0.31	EFT0523051	Call
3	Pin	4	Nickel	5	1.87	2.13	0.747	0.87	0.38	0.05	0.375	EFT0541051	Call
3	Pin	4	Stainless Steel	1	1.87	2.13	0.747	0.87	0.38	0.05	0.375	EFT0542051	Call
3	Pin	4	Copper	15	1.87	2.13	0.747	0.87	0.38	0.05	0.375	EFT0543051	Call

■ **CF Flanged**

Voltage: 5,000

Amperage: 1; 2; 5; 15; 30

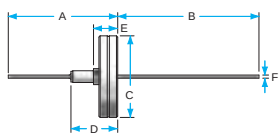


Figure 1 (1 pin or 1 tube)

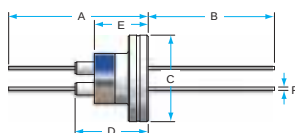


Figure 2 (2 pins or 2 tubes)

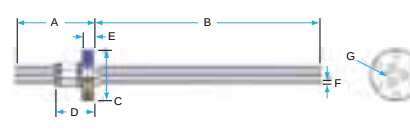


Figure 3 (3 pins)

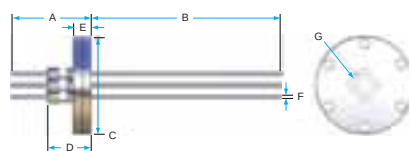


Figure 4 (4 pins or 4 tubes)

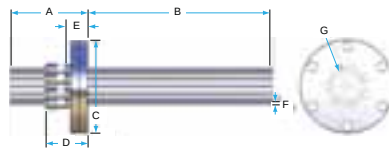


Figure 5 (8 pins)

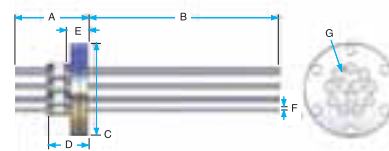


Figure 6 (12 pins)

Figure	Pins or Tubes	# of Pins or Tubes	Conductor Material	Flange Size	Amps Per Pin/Tube	A	B	C	D	E	F	G	Part Number	Price
1	Pin	1	Nickel	1.33" CF	5	1.85	2.15	1.33	0.85	0.37	0.05	N/A	EFT0511052	Call
1	Pin	1	Nickel	2.75" CF	5	1.85	2.15	2.75	0.85	0.37	0.05	N/A	EFT0511053	Call
1	Pin	1	Nickel	1.33" CF	15	2.30	5.00	1.33	1.20	0.50	0.094	N/A	EFT0511092	Call
1	Pin	1	Nickel	2.75" CF	15	2.30	5.00	2.75	1.20	0.50	0.094	N/A	EFT0511093	Call
1	Pin	1	Stainless Steel	1.33" CF	1	1.85	2.15	1.33	0.85	0.37	0.05	N/A	EFT0512052	Call
1	Pin	1	Stainless Steel	2.75" CF	1	1.85	2.15	2.75	0.85	0.37	0.05	N/A	EFT0512053	Call
1	Pin	1	Stainless Steel	1.33" CF	2	2.30	5.00	1.33	1.20	0.50	0.094	N/A	EFT0512092	Call
1	Pin	1	Stainless Steel	2.75" CF	2	2.30	5.00	2.75	1.20	0.50	0.094	N/A	EFT0512093	Call
1	Pin	1	Copper	1.33" CF	15	1.85	2.15	1.33	0.85	0.37	0.05	N/A	EFT0513052	Call
1	Pin	1	Copper	2.75" CF	15	1.85	2.15	2.75	0.85	0.37	0.05	N/A	EFT0513053	Call
1	Pin	1	Copper	1.33" CF	30	2.30	5.00	1.33	1.20	0.50	0.094	N/A	EFT0513092	Call
1	Pin	1	Copper	2.75" CF	30	2.30	5.00	2.75	1.20	0.50	0.094	N/A	EFT0513093	Call
2	Pin	2	Nickel	1.33" CF	5	2.37	1.63	1.33	1.37	0.88	0.05	0.31	EFT0521052	Call
2	Pin	2	Nickel	2.75" CF	5	1.87	2.13	2.75	0.87	0.38	0.05	0.31	EFT0521053	Call
2	Pin	2	Nickel	1.33" CF	15	2.25	5.32	1.33	1.23	0.50	0.092	0.36	EFT0521092	Call
2	Pin	2	Nickel	2.75" CF	15	2.30	5.00	2.75	1.20	0.50	0.094	0.75	EFT0521093	Call
2	Pin	2	Stainless Steel	1.33" CF	1	2.37	1.63	1.33	1.37	0.88	0.05	0.31	EFT0522052	Call
2	Pin	2	Stainless Steel	2.75" CF	1	1.87	2.13	2.75	0.87	0.38	0.05	0.31	EFT0522053	Call
2	Pin	2	Stainless Steel	2.75" CF	2	2.30	5.00	2.75	1.20	0.50	0.094	0.75	EFT0522093	Call
2	Pin	2	Copper	1.33" CF	15	2.37	1.63	1.33	1.37	0.88	0.05	0.31	EFT0523052	Call
2	Pin	2	Copper	2.75" CF	15	1.87	2.13	2.75	0.87	0.38	0.05	0.31	EFT0523053	Call
2	Pin	2	Copper	1.33" CF	30	2.25	5.32	1.33	1.23	0.50	0.094	0.36	EFT0523092	Call
2	Pin	2	Copper	2.75" CF	30	2.30	5.00	2.75	1.20	0.50	0.094	0.75	EFT0523093	Call
3	Pin	3	Nickel	1.33" CF	15	2.00	5.80	1.33	1.00	0.37	0.094	0.41	EFT0531092	Call
3	Pin	3	Copper	1.33" CF	30	2.00	5.80	1.33	1.00	0.37	0.094	0.41	EFT0533092	Call
4	Pin	4	Nickel	1.33" CF	5	2.37	1.63	1.33	1.37	0.88	0.05	0.375	EFT0541052	Call
4	Pin	4	Nickel	2.75" CF	5	1.87	2.13	2.75	0.87	0.38	0.05	0.375	EFT0541053	Call
4	Pin	4	Stainless Steel	1.33" CF	1	2.37	1.63	1.33	1.37	0.88	0.05	0.375	EFT0542052	Call
4	Pin	4	Stainless Steel	2.75" CF	1	1.87	2.13	2.75	0.87	0.38	0.05	0.375	EFT0542053	Call
4	Pin	4	Copper	1.33" CF	15	2.37	1.63	1.33	1.37	0.88	0.05	0.375	EFT0543052	Call
4	Pin	4	Copper	2.75" CF	15	1.87	2.13	2.75	0.87	0.38	0.05	0.375	EFT0543053	Call
4	Pin	4	Nickel	2.75" CF	15	2.25	5.32	2.75	1.23	0.50	0.092	0.62	EFT0541093	Call
4	Pin	4	Copper	2.75" CF	30	2.25	5.32	2.75	1.23	0.50	0.094	0.62	EFT0543093	Call
5	Pin	8	Nickel	2.75" CF	5	1.60	2.40	2.75	0.60	0.31	0.05	0.75	EFT0581053	Call
5	Pin	8	Nickel	2.75" CF	15	2.20	5.60	2.75	1.20	0.50	0.094	1.10	EFT0581093	Call
5	Pin	8	Copper	2.75" CF	30	2.25	5.32	2.75	1.23	0.50	0.094	1.00	EFT0583093	Call
6	Pin	12	Nickel	2.75" CF	15	2.20	5.60	2.75	1.20	0.50	0.094	1.20	EFT05W1093	Call
6	Pin	12	Copper	2.75" CF	30	2.25	5.32	2.75	1.23	0.50	0.094	1.21	EFT05W3093	Call

Refer to Connectors & Cabling, starting on page 3-113, for inline barrel connectors, set screw connectors, crimp/solder connectors, bare wire, wire beads, and ceramic wire discs.

➤ 5,000 Volts

■ CF Flanged

Voltage: 5,000

Amperage: 7; 75; 150

3

Feedthroughs

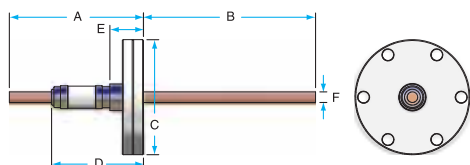


Figure 1B (1 pin or 1 tube)

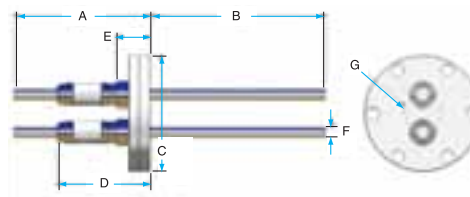


Figure 2B (2 pins or 2 tubes)

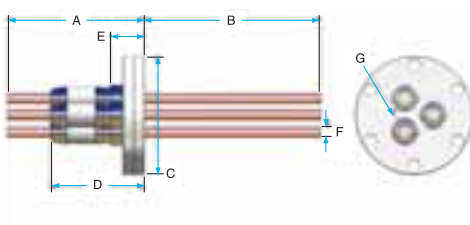


Figure 3B (3 pins or 3 tubes)

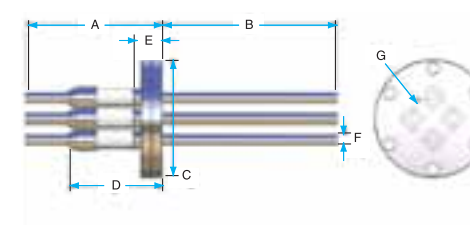


Figure 4B (4 pins or 4 tubes)

Figure	Pins or Tubes	# of Pins or Tubes	Conductor Material	Flange Size	Amps Per Pin/Tube	Dimensions (in.)								Part No.	Price
1B	Pin	1	Nickel	1.33" CF	75	3.13	4.12	1.33	2.13	0.75	0.25	N/A		EFT0511252	Call
1B	Pin	1	Nickel	2.75" CF	75	3.13	4.12	2.75	2.13	0.75	0.25	N/A		EFT0511253	Call
1B	Pin	1	Stainless Steel	1.33" CF	7	3.13	4.12	1.33	2.13	0.75	0.25	N/A		EFT0512252	Call
1B	Pin	1	Stainless Steel	2.75" CF	7	3.13	4.12	2.75	2.13	0.75	0.25	N/A		EFT0512253	Call
1B	Tube	1	Stainless Steel	2.75" CF	7	3.13	4.12	2.75	2.13	0.75	0.25	N/A		FTT0512253	Call
1B	Pin	1	Copper	1.33" CF	150	3.13	4.12	1.33	2.13	0.75	0.25	N/A		EFT0513252	Call
1B	Tube	1	Copper	1.33" CF	150	3.13	4.12	1.33	2.13	0.75	0.25	N/A		FTT0513252	Call
1B	Pin	1	Copper	2.75" CF	150	3.13	4.07	2.75	2.13	0.75	0.25	N/A		EFT0513253	Call
1B	Tube	1	Copper	2.75" CF	150	3.13	4.12	2.75	2.13	0.75	0.25	N/A		FTT0513253	Call
2B	Pin	2	Nickel	2.75" CF	75	3.13	4.12	2.75	2.13	0.75	0.25	0.87		EFT0521253	Call
2B	Pin	2	Copper	2.75" CF	150	3.13	4.12	2.75	2.13	0.75	0.25	0.87		EFT0523253	Call
2B	Tube	2	Copper	2.75" CF	150	3.13	4.12	2.75	2.13	0.75	0.25	0.87		FTT0523253	Call
3B	Tube	3	Stainless Steel	2.75" CF	7	3.18	4.07	2.75	2.18	0.57	0.25	0.95		FTT0532253	Call
3B	Pin	3	Copper	2.75" CF	150	3.18	4.07	2.75	2.18	0.57	0.25	0.95		EFT0533253	Call
3B	Tube	3	Copper	2.75" CF	150	3.18	4.07	2.75	2.18	0.57	0.25	0.95		FTT0533253	Call
4B	Pin	4	Nickel	2.75" CF	75	3.18	4.07	2.75	2.18	0.57	0.25	0.95		EFT0541253	Call
4B	Pin	4	Stainless Steel	2.75" CF	7	3.18	4.07	2.75	2.18	0.57	0.25	0.95		EFT0542253	Call
4B	Pin	4	Copper	2.75" CF	150	3.18	4.07	2.75	2.18	0.57	0.25	0.95		EFT0543253	Call
4B	Tube	4	Copper	2.75" CF	150	3.18	4.07	2.75	2.18	0.57	0.25	0.95		FTT0543253	Call

Refer to Connectors & Cabling, starting on page 3-113, for inline barrel connectors, set screw connectors, crimp/solder connectors, bare wire, wire beads, and ceramic wire discs.

■ **KF (QF) Flanged**

Voltage: 5,000

Amperage: 1; 2; 5; 15; 30

Figure	Pins or Tubes	# of Pins or Tubes	Conductor Material	Flange Size	Amps/ Pin	A	B	Dimensions (in.)					F	G	Part No.	Price
1	Pin	1	Nickel	KF16	5	1.85	2.15	1.18	0.85	0.37	0.05	N/A			EFT0511058	Call
1	Pin	1	Nickel	KF40	5	1.85	2.15	2.16	0.85	0.37	0.05	N/A			EFT0511058B	Call
1	Pin	1	Nickel	KF16	15	2.30	5.00	1.18	1.20	0.50	0.094	N/A			EFT0511098	Call
1	Pin	1	Nickel	KF40	15	2.30	5.00	2.16	1.20	0.50	0.094	N/A			EFT0511098B	Call
1	Pin	1	Stainless Steel	KF16	1	1.85	2.15	1.18	0.85	0.37	0.05	N/A			EFT0512058	Call
1	Pin	1	Stainless Steel	KF40	1	1.85	2.15	2.16	0.85	0.37	0.05	N/A			EFT0512058B	Call
1	Pin	1	Stainless Steel	KF16	2	2.30	5.00	1.18	1.20	0.50	0.094	N/A			EFT0512098	Call
1	Pin	1	Stainless Steel	KF40	2	2.30	5.00	2.16	1.20	0.50	0.094	N/A			EFT0512098B	Call
1	Pin	1	Copper	KF16	15	1.85	2.15	1.18	0.85	0.37	0.05	N/A			EFT0513058	Call
1	Pin	1	Copper	KF40	15	1.85	2.15	2.16	0.85	0.37	0.05	N/A			EFT0513058B	Call
1	Pin	1	Copper	KF16	30	2.30	5.00	1.18	1.20	0.50	0.094	N/A			EFT0513098	Call
1	Pin	1	Copper	KF40	30	2.30	5.00	2.16	1.20	0.50	0.094	N/A			EFT0513098B	Call
2	Pin	2	Nickel	KF16	5	1.87	2.13	1.18	0.87	0.38	0.05	0.31			EFT0521058	Call
2	Pin	2	Nickel	KF25	5	1.87	2.13	1.57	0.87	0.38	0.05	0.31			EFT0521058A	Call
2	Pin	2	Nickel	KF40	5	1.87	2.13	2.16	0.87	0.38	0.05	0.31			EFT0521058B	Call
2	Pin	2	Nickel	KF40	15	2.30	5.00	2.16	1.20	0.50	0.094	0.75			EFT0521098B	Call
2	Pin	2	Nickel	KF50	15	2.30	5.00	2.95	1.20	0.50	0.094	0.95			EFT0521098C	Call
2	Pin	2	Stainless Steel	KF16	1	1.87	2.13	1.18	0.87	0.38	0.05	0.31			EFT0522058	Call
2	Pin	2	Stainless Steel	KF25	1	1.87	2.13	1.57	0.87	0.38	0.05	0.31			EFT0522058A	Call
2	Pin	2	Stainless Steel	KF40	1	1.87	2.13	2.16	0.87	0.38	0.05	0.31			EFT0522058B	Call
2	Pin	2	Stainless Steel	KF40	2	2.30	5.00	2.16	1.20	0.50	0.094	0.75			EFT0522098B	Call
2	Pin	2	Copper	KF16	15	1.87	2.13	1.18	0.87	0.38	0.05	0.31			EFT0523058	Call
2	Pin	2	Copper	KF25	15	1.87	2.13	1.57	0.87	0.38	0.05	0.31			EFT0523058A	Call
2	Pin	2	Copper	KF40	15	1.87	2.13	2.16	0.87	0.38	0.05	0.31			EFT0523058B	Call
2	Pin	2	Copper	KF16	30	1.95	5.62	1.18	0.93	0.38	0.094	0.39			EFT0523098	Call
2	Pin	2	Copper	KF25	30	2.30	5.00	1.57	1.20	0.50	0.094	0.50			EFT0523098A	Call
2	Pin	2	Copper	KF40	30	2.30	5.00	2.16	1.20	0.50	0.094	0.75			EFT0523098B	Call
3	Pin	4	Nickel	KF16	5	1.87	2.13	1.18	0.87	0.38	0.05	0.375			EFT0541058	Call
3	Pin	4	Nickel	KF40	5	1.87	2.13	2.16	0.87	0.38	0.05	0.375			EFT0541058B	Call
3	Pin	4	Stainless Steel	KF16	1	1.87	2.13	1.18	0.87	0.38	0.05	0.375			EFT0542058	Call
3	Pin	4	Stainless Steel	KF25	1	1.87	2.13	1.57	0.87	0.38	0.05	0.375			EFT0542058A	Call
3	Pin	4	Stainless Steel	KF40	1	1.87	2.13	2.16	0.87	0.38	0.05	0.375			EFT0542058B	Call
3	Pin	4	Copper	KF16	15	1.87	2.13	1.18	0.87	0.38	0.05	0.375			EFT0543058	Call
3	Pin	4	Copper	KF25	15	1.87	2.13	1.57	0.87	0.38	0.05	0.375			EFT0543058A	Call
3	Pin	4	Copper	KF40	15	1.87	2.13	2.16	0.87	0.38	0.05	0.375			EFT0543058B	Call
3	Pin	4	Copper	KF50	15	1.87	2.13	2.95	0.87	0.38	0.05	0.375			EFT0543058C	Call
3	Pin	4	Copper	KF40	30	1.95	5.62	2.16	0.93	0.38	0.094	0.62			EFT0543098B	Call
4	Pin	8	Copper	KF40	30	1.95	5.62	2.16	0.93	0.38	0.094	1.00			EFT0583098B	Call

Refer to Connectors & Cabling, starting on page 3-113, for inline barrel connectors, set screw connectors, crimp/solder connectors, bare wire, wire beads, and ceramic wire discs.

Please refer to 3-18 for drawings



➤ 5,000 Volts

■ KF (QF) Flanged

Voltage: 5,000
Amperage: 150

Figure	# of Pins	Conductor Material	Flange Size	Amps/Pin	Dimensions (in.)						Part No.	Price
					A	B	C	D	E	F		
1B	1	Copper	KF16	150	3.13	4.12	1.33	2.13	0.54	0.25	EFT0513258	Call
2B	4	Copper	KF50	150	3.18	4.07	2.75	2.18	0.57	0.25	EFT0543258C	Call

Refer to Connectors & Cabling, starting on page 3-113, for inline barrel connectors, set screw connectors, crimp/solder connectors, bare wire, wire beads, and ceramic wire discs.

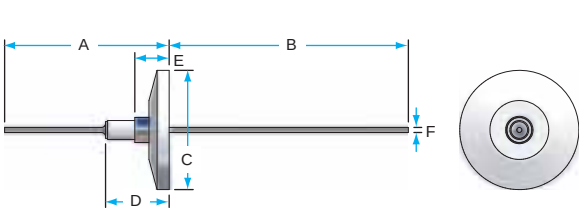


Figure 1 (1 pin or 1 tube)

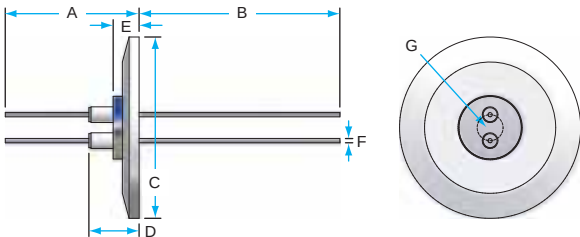


Figure 2 (2 pins or 2 tubes)

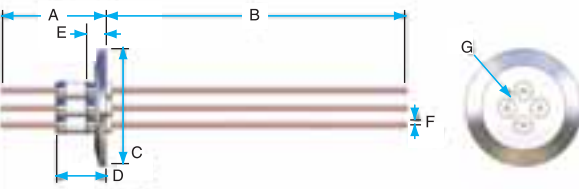


Figure 3 (4 pins or 4 tubes)

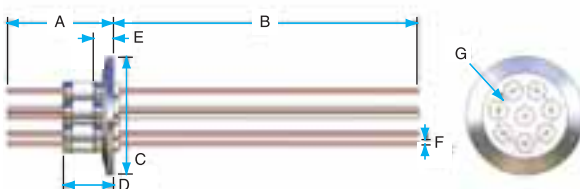


Figure 4 (8 pins or 8 tubes)

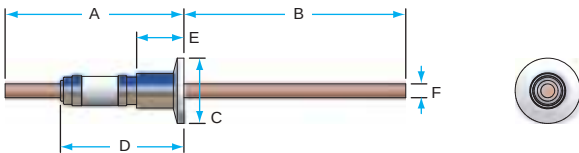


Figure 1B (1 pin)

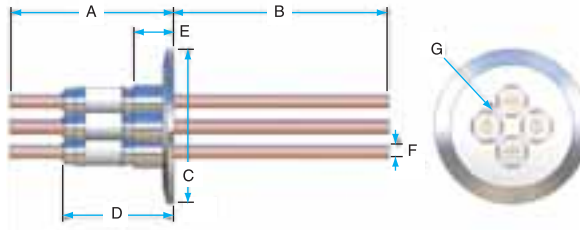
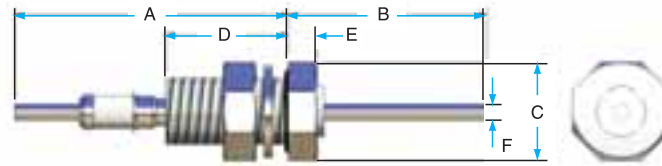


Figure 2B (4 pins)

■ **1" Baseplate**

Voltage: 5,000

Amperage: 5; 50; 100; 150



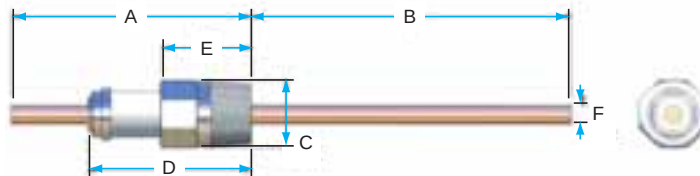
Mounting	Pins or Tubes	# of Pins or Tubes	Conductor Material	Amps/Pin or Tube	Dimensions (in.)						Part No.	Price
					A	B	C	D	E	F		
1" BP	Pin	1	Nickel	50	4.21	3.04	1.50	1.88	0.44	0.25	EFT0511254	Call
1" BP	Pin	1	Stainless Steel	5	4.21	3.04	1.50	1.88	0.44	0.25	EFT0512254	Call
1" BP	Pin	1	Copper	100	4.21	3.04	1.50	1.88	0.44	0.25	EFT0513254	Call
1" BP	Tube	1	Copper	150	4.21	3.04	1.50	1.88	0.44	0.25	FTT0513254	Call

Refer to Connectors & Cabling, starting on page 3-113, for inline barrel connectors, set screw connectors, crimp/solder connectors, bare wire, wire beads, and ceramic wire discs.

■ **NPT Male**

Voltage: 5,000

Amperage: 3; 5; 15; 30; 50; 100



# of Pins or Tubes	Pins or Tubes	Conductor Material	Mounting	Amps/Pin	Dimensions (in.)						Part No.	Price
					A	B	C	D	E	F		
1	Pin	Nickel	1/8" NPT	5	2.48	4.77	0.437	1.48	0.75	0.05	EFT0511055	Call
1	Pin	Nickel	1/8" NPT	15	2.48	4.77	0.437	1.48	0.75	0.092	EFT0511095	Call
1	Pin	Stainless Steel	1/8" NPT	3	2.48	4.77	0.437	1.48	0.75	0.094	EFT0512095	Call
1	Pin	Copper	1/8" NPT	15	2.48	4.77	0.437	1.48	0.75	0.05	EFT0513055	Call
1	Pin	Copper	1/8" NPT	30	2.48	4.77	0.437	1.48	0.75	0.094	EFT0513095	Call
1	Pin	Nickel	1/2" NPT	50	3.42	3.83	0.875	2.42	1.09	0.25	EFT0511255	Call
1	Pin	Stainless Steel	1/2" NPT	5	3.42	3.83	0.875	2.42	1.09	0.25	EFT0512255	Call
1	Pin	Copper	1/2" NPT	100	3.42	3.83	0.875	2.42	1.09	0.25	EFT0513255	Call
1	Tube	Stainless Steel	1/2" NPT	5	3.42	3.83	0.875	2.42	1.09	0.25	FTT0512255	Call
1	Tube	Copper	1/2" NPT	100	3.42	3.83	0.875	2.42	1.09	0.25	FTT0513255	Call

Refer to Connectors & Cabling, starting on page 3-113, for inline barrel connectors, set screw connectors, crimp/solder connectors, bare wire, wire beads, and ceramic wire discs.

➤ 12,000 Volts

■ Weldable

Voltage: 12,000

Amperage: 15; 30

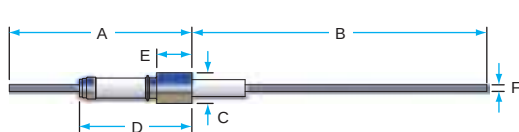


Figure 1 (1 pin)

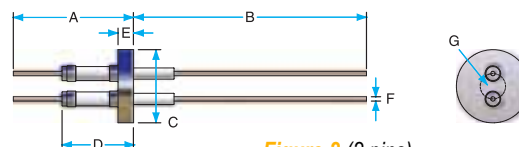


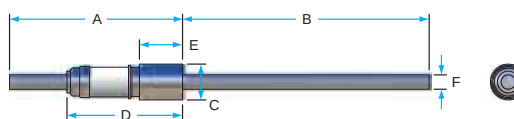
Figure 2 (2 pins)

Figure	# of Pins	Conductor Material	Amps/ Pin	Dimensions (in.)							Part No.	Price
1	1	Nickel	15	A	B	C	D	E	F	G	EFT1211091	Call
1	1	Copper	30	2.63	4.94	0.435	1.67	0.50	0.094	N/A	EFT1213091	Call
2	2	Copper	30	2.63	4.94	1.50	1.67	0.50	0.094	0.38	EFT1223091	Call

Refer to Connectors & Cabling, starting on page 3-113, for inline barrel connectors, set screw connectors, crimp/solder connectors, bare wire, wire beads, and ceramic wire discs.

Voltage: 12,000

Amperage: 7; 75; 150



Pins or Tubes	# of Pins	Conductor Material	Amps/ Pin	Dimensions (in.)							Part No.	Price
Tube	1	Nickel	75	A	B	C	D	E	F		FTT1211251	Call
Tube	1	Stainless Steel	7	3.10	4.20	0.622	2.10	0.75	0.25		FTT1212251	Call
Tube	1	Copper	150	3.10	4.20	0.622	2.10	0.75	0.25		FTT1213251	Call
Pin	1	Nickel	75	3.10	4.20	0.622	2.10	0.75	0.25		EFT1211251	Call
Pin	1	Stainless Steel	7	3.10	4.20	0.622	2.10	0.75	0.25		EFT1212251	Call
Pin	1	Copper	150	3.10	4.20	0.622	2.10	0.75	0.25		EFT1213251	Call

Refer to Connectors & Cabling, starting on page 3-113, for inline barrel connectors, set screw connectors, crimp/solder connectors, bare wire, wire beads, and ceramic wire discs.

■ CF Flanged

Voltage: 12,000

Amperage: 30

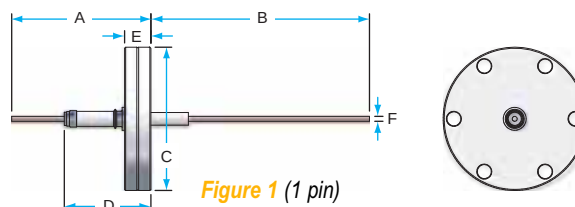


Figure 1 (1 pin)

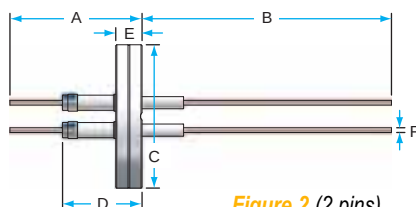


Figure 2 (2 pins)

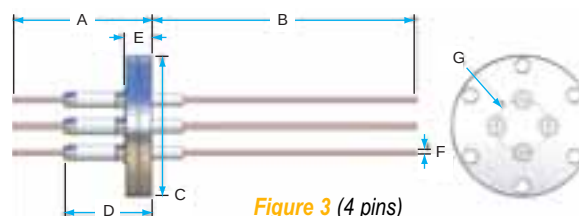


Figure 3 (4 pins)

Figure	Flange Size	# of Pins	Conductor Material	Amps/ Pin	Dimensions (in.)							Part No.	Price
1	1.33" CF	1	Nickel	15	A	B	C	D	E	F	G	EFT1211092	Call
1	1.33" CF	1	Copper	30	2.63	4.94	1.33	1.67	0.50	0.094	N/A	EFT1213092	Call
1	2.75" CF	1	Nickel	15	2.63	4.94	2.75	1.67	0.50	0.094	N/A	EFT1211093	Call
1	2.75" CF	1	Copper	30	2.63	4.94	2.75	1.67	0.50	0.094	N/A	EFT1213093	Call
2	2.75" CF	2	Copper	30	2.63	4.94	2.75	1.67	0.50	0.094	0.50	EFT1223093	Call
2	2.75" CF	2	Nickel	15	2.63	4.94	2.75	1.67	0.50	0.094	0.75	EFT1221093	Call
3	2.75" CF	4	Nickel	15	2.70	4.10	2.75	1.70	0.50	0.094	1.00	EFT1241093	Call
3	2.75" CF	4	Copper	30	2.70	4.10	2.75	1.70	0.50	0.094	1.00	EFT1243093	Call

Refer to Connectors & Cabling, starting on page 3-113, for inline barrel connectors, set screw connectors, crimp/solder connectors, bare wire, wire beads, and ceramic wire discs.

➤ **12,000 Volts**

■ **CF Flanged**

Voltage: 12,000

Amperage: 7; 75; 150

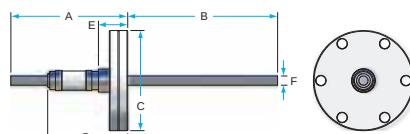


Figure 1B (1 pin or 1 tube)

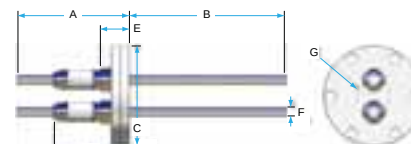


Figure 2B (2 pins or 2 tubes)

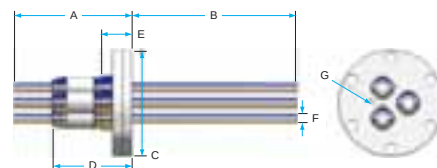


Figure 3B (3 pins or 3 tubes)

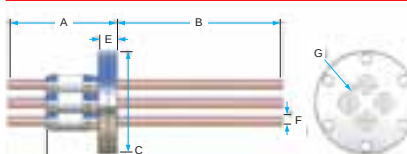


Figure 4B (4 pins or 4 tubes)

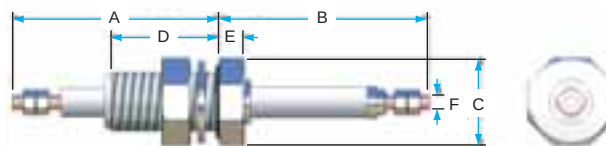
Figure	Pins or Tubes	# of Pins or Tubes	Flange Size	Conductor Material	Amps/ Pin	Dimensions (in.)							Part No.	Price
1B	Tube	1	1.33" CF	Nickel	75	3.10	4.20	1.33	2.10	0.75	0.25	N/A	FTT1211252	Call
1B	Tube	1	1.33" CF	Stainless Steel	7	3.10	4.20	1.33	2.10	0.75	0.25	N/A	FTT1212252	Call
1B	Tube	1	1.33" CF	Copper	150	3.10	4.20	1.33	2.10	0.75	0.25	N/A	FTT1213252	Call
1B	Tube	1	2.75" CF	Nickel	75	3.10	4.20	2.75	2.10	0.75	0.25	N/A	FTT1211253	Call
1B	Tube	1	2.75" CF	Stainless Steel	7	3.10	4.20	2.75	2.10	0.75	0.25	N/A	FTT1212253	Call
1B	Tube	1	2.75" CF	Copper	150	3.10	4.20	2.75	2.10	0.75	0.25	N/A	FTT1213253	Call
1B	Pin	1	1.33" CF	Nickel	75	3.10	4.20	1.33	2.10	0.75	0.25	N/A	EFT1211252	Call
1B	Pin	1	1.33" CF	Stainless Steel	7	3.10	4.20	1.33	2.10	0.75	0.25	N/A	EFT1212252	Call
1B	Pin	1	1.33" CF	Copper	150	3.10	4.20	1.33	2.10	0.75	0.25	N/A	EFT1213252	Call
1B	Pin	1	2.75" CF	Nickel	75	3.10	4.20	2.75	2.10	0.75	0.25	N/A	EFT1211253	Call
1B	Pin	1	2.75" CF	Stainless Steel	7	3.10	4.20	2.75	2.10	0.75	0.25	N/A	EFT1212253	Call
1B	Pin	1	2.75" CF	Copper	150	3.10	4.20	2.75	2.10	0.75	0.25	N/A	EFT1213253	Call
2B	Pin	2	2.75" CF	Nickel	75	3.10	4.20	2.75	2.10	0.75	0.25	0.87	EFT1221253	Call
2B	Tube	2	2.75" CF	Nickel	75	3.10	4.20	2.75	2.10	0.75	0.25	0.87	FTT1221253	Call
2B	Pin	2	2.75" CF	Stainless Steel	7	3.10	4.20	2.75	2.10	0.75	0.25	0.87	EFT1222253	Call
2B	Tube	2	2.75" CF	Stainless Steel	7	3.10	4.20	2.75	2.10	0.75	0.25	0.87	FTT1222253	Call
2B	Pin	2	2.75" CF	Copper	150	3.10	4.20	2.75	2.10	0.75	0.25	0.87	EFT1223253	Call
2B	Tube	2	2.75" CF	Copper	150	3.10	4.20	2.75	2.10	0.75	0.25	0.87	FTT1223253	Call
3B	Pin	3	2.75" CF	Nickel	75	3.10	4.20	2.75	2.10	0.75	0.25	0.87	EFT1231253	Call
3B	Tube	3	2.75" CF	Copper	150	3.10	4.20	2.75	2.10	0.75	0.25	0.87	FTT1233253	Call
4B	Pin	4	2.75" CF	Copper	150	2.90	4.40	2.75	2.10	0.75	0.25	0.94	EFT1243253	Call
4B	Tube	4	2.75" CF	Copper	150	2.90	4.40	2.75	2.10	0.75	0.25	0.94	FTT1243253	Call

Refer to Connectors & Cabling, starting on page 3-113, for inline barrel connectors, set screw connectors, crimp/solder connectors, bare wire, wire beads, and ceramic wire discs.

■ **Baseplate**

Voltage: 12,000

Amperage: 5; 75; 90; 100



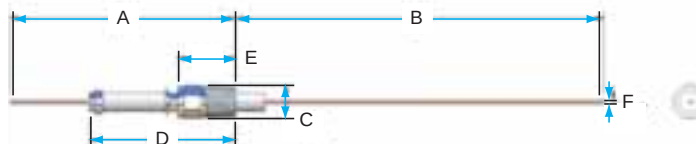
# of Pins	Mounting	Conductor Material	Amps/ Pin	Thread Size (in.)	Dimensions (in.)							Part No.	Price
1	1" BP	Nickel	75	1/4-20	3.60	3.65	1.50	1.88	0.44	0.25		EFT1211254	Call
1	1" BP	Stainless Steel	5	1/4-20	3.60	3.65	1.50	1.88	0.44	0.25		EFT1212254	Call
1	1" BP	Copper	100	1/4-20	3.60	3.65	1.50	1.88	0.44	0.25		EFT1213254	Call
1	1" BP	Molybdenum	90	1/4-28	5.20	2.60	1.50	1.90	0.44	0.25		EFT1214254	Call

Refer to Connectors & Cabling, starting on page 3-113, for inline barrel connectors, set screw connectors, crimp/solder connectors, bare wire, wire beads, and ceramic wire discs.

■ **NPT (Male)**

Voltage: 12,000

Amperage: 5; 15; 30



# of Pins	Mounting	Conductor Material	Amps/ Pin	Dimensions (in.)							Part No.	Price
1	1/8" NPT	Nickel	15		2.92	4.77	0.437	1.90	0.75	0.092	EFT1211095	Call
1	1/8" NPT	Copper	30		2.92	4.77	0.437	1.90	0.75	0.094	EFT1213095	Call
1	1/8" NPT	Nickel	5		2.92	4.77	0.437	1.90	0.75	0.05	EFT1211055	Call
1	1/8" NPT	Copper	15		2.92	4.77	0.437	1.90	0.75	0.05	EFT1213055	Call

Refer to Connectors & Cabling, starting on page 3-113, for inline barrel connectors, set screw connectors, crimp/solder connectors, bare wire, wire beads, and ceramic wire discs.

3

Feedthroughs

➤ 12,000 Volts

■ KF (QF) Flanged

Voltage: 12,000

Amperage: 15; 30

3

Feedthroughs

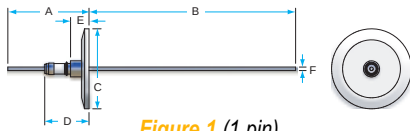


Figure 1 (1 pin)

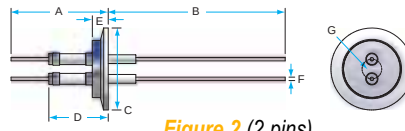


Figure 2 (2 pins)

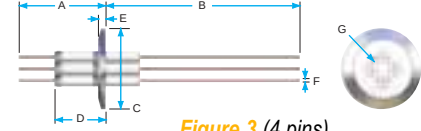


Figure 3 (4 pins)

Figure	Flange Size	# of Pins	Conductor Material	Amps/ Pin	Dimensions (in.)								Part No.	Price
1	KF16	1	Nickel	15	2.63	4.94	1.18	1.67	0.50	0.094	N/A		EFT1211098	Call
1	KF16	1	Copper	30	2.63	4.94	1.18	1.67	0.50	0.094	N/A		EFT1213098	Call
1	KF40	1	Nickel	15	2.63	4.94	2.16	1.67	0.50	0.094	N/A		EFT1211098B	Call
1	KF40	1	Copper	30	2.63	4.94	2.16	1.67	0.50	0.094	N/A		EFT1213098B	Call
1	KF25	1	Copper	30	2.63	4.94	1.57	1.67	0.50	0.094	0.39		EFT1213098A	Call
2	KF40	2	Copper	30	2.63	4.94	2.16	1.67	0.50	0.094	0.50		EFT1223098B	Call
2	KF40	2	Nickel	15	2.63	4.94	2.16	1.67	0.50	0.094	0.75		EFT1221098B	Call
3	KF40	4	Nickel	15	2.33	5.20	2.16	1.37	0.50	0.092	0.62		EFT1241098B	Call
3	KF40	4	Copper	30	2.33	5.20	2.16	1.37	0.50	0.094	0.62		EFT1243098B	Call

Refer to Connectors & Cabling, starting on page 3-113, for inline barrel connectors, set screw connectors, crimp/solder connectors, bare wire, wire beads, and ceramic wire discs.

Voltage: 12,000

Amperage: 7; 75; 150

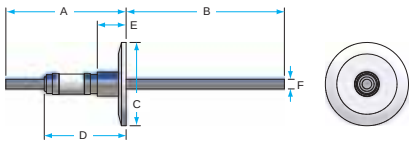


Figure 1B (1 pin or 1 tube)

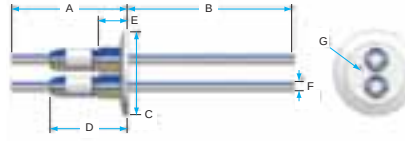


Figure 2B (2 pins or 2 tubes)

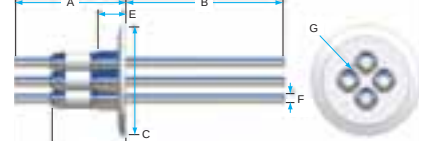


Figure 3B (4 pins or 4 tubes)

Figure	Pins or Tubes	# of Pins	Flange Size	Conductor Material	Amps/ Pin	Dimensions (in.)								Part No.	Price
1B	Tube	1	KF16	Nickel	75	3.10	4.20	1.18	2.10	0.75	0.25	N/A		FTT1211258	Call
1B	Tube	1	KF16	Stainless Steel	7	3.10	4.20	1.18	2.10	0.75	0.25	N/A		FTT1212258	Call
1B	Tube	1	KF16	Copper	150	3.10	4.20	1.18	2.10	0.75	0.25	N/A		FTT1213258	Call
1B	Tube	1	KF40	Nickel	75	3.10	4.20	2.16	2.10	0.75	0.25	N/A		FTT1211258B	Call
1B	Tube	1	KF40	Stainless Steel	7	3.10	4.20	2.16	2.10	0.75	0.25	N/A		FTT1212258B	Call
1B	Tube	1	KF40	Copper	150	3.10	4.20	2.16	2.10	0.75	0.25	N/A		FTT1213258B	Call
1B	Pin	1	KF16	Nickel	75	3.10	4.20	1.18	2.10	0.75	0.25	N/A		EFT1211258	Call
1B	Pin	1	KF16	Stainless Steel	7	3.10	4.20	1.18	2.10	0.75	0.25	N/A		EFT1212258	Call
1B	Pin	1	KF16	Copper	150	3.10	4.20	1.18	2.10	0.75	0.25	N/A		EFT1213258	Call
1B	Pin	1	KF40	Nickel	75	3.10	4.20	2.16	2.10	0.75	0.25	N/A		EFT1211258B	Call
1B	Pin	1	KF40	Stainless Steel	7	3.10	4.20	2.16	2.10	0.75	0.25	N/A		EFT1212258B	Call
1B	Pin	1	KF40	Copper	150	3.10	4.20	2.16	2.10	0.75	0.25	N/A		EFT1213258B	Call
1B	Pin	1	KF25	Nickel	75	3.10	4.20	1.57	2.10	0.75	0.25	N/A		EFT1211258A	Call
1B	Pin	1	KF25	Stainless Steel	7	3.10	4.20	1.57	2.10	0.75	0.25	N/A		EFT1212258A	Call
1B	Pin	1	KF25	Copper	150	3.10	4.20	1.57	2.10	0.75	0.25	N/A		EFT1213258A	Call
1B	Pin	1	KF50	Copper	150	3.10	4.20	2.95	2.10	0.75	0.25	N/A		EFT1213258C	Call
2B	Pin	2	KF40	Nickel	75	3.10	4.20	2.16	2.10	0.75	0.25	0.75		EFT1221258B	Call
2B	Tube	2	KF40	Nickel	75	3.10	4.20	2.16	2.10	0.75	0.25	0.75		FTT1221258B	Call
2B	Pin	2	KF40	Stainless Steel	7	3.10	4.20	2.16	2.10	0.75	0.25	0.75		EFT1222258B	Call
2B	Tube	2	KF40	Stainless Steel	7	3.10	4.20	2.16	2.10	0.75	0.25	0.75		FTT1222258B	Call
2B	Pin	2	KF40	Copper	150	3.10	4.20	2.16	2.10	0.75	0.25	0.75		EFT1223258B	Call
2B	Tube	2	KF40	Copper	150	3.10	4.20	2.16	2.10	0.75	0.25	0.75		FTT1223258B	Call
2B	Pin	2	KF50	Copper	150	2.90	4.40	2.95	2.10	0.75	0.25	0.94		EFT1223258C	Call
3B	Pin	4	KF50	Stainless Steel	7	2.90	4.40	2.95	2.10	0.75	0.25	0.94		EFT1242258C	Call
3B	Pin	4	KF50	Copper	150	2.90	4.40	2.95	2.10	0.75	0.25	0.94		EFT1243258C	Call
3B	Tube	4	KF50	Copper	150	2.90	4.40	2.95	2.10	0.75	0.25	0.94		FTT1243258C	Call

Refer to Connectors & Cabling, starting on page 3-113, for inline barrel connectors, set screw connectors, crimp/solder connectors, bare wire, wire beads, and ceramic wire discs.

➤ **20,000+ Volts**

■ **Weldable**

Voltages: 20,000; 25,000; 30,000; 50,000;
60,000; 100,000

Amperage: 2; 3; 15; 30; 75; 100; 150

3

Feedthroughs

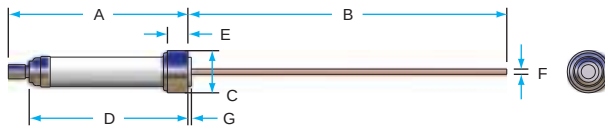


Figure 1 (1 pin)

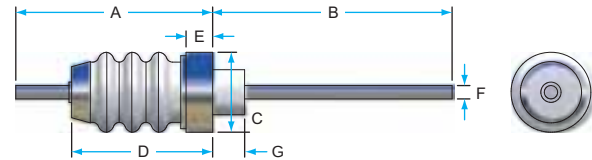


Figure 2 (1 pin)

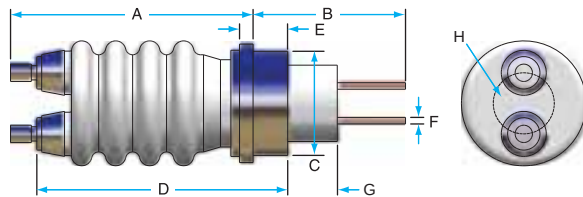


Figure 3 (2 pins)

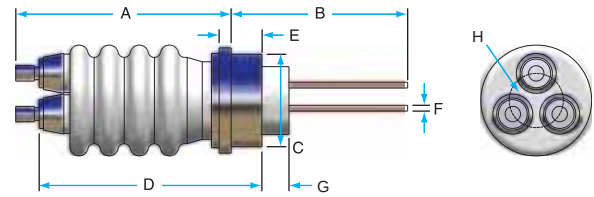


Figure 4 (3 pins)

Figure	# of Pins	Atm. Side Thread	Amps/Pin	Voltage (kV)	Conductor Material	Dimensions (in.)								Part No.	Price
						A	B	C	D	E	F	G	H		
1	1	1/4-28	15	20	Nickel	3.17	5.63	0.747	2.80	0.29	0.092	0.03	N/A	EFT2011091	Call
1	1	1/4-28	2	20	Stainless Steel	3.17	5.63	0.747	2.80	0.29	0.092	0.03	N/A	EFT2012091	Call
1	1	1/4-28	30	20	Copper	3.17	5.63	0.747	2.80	0.29	0.092	0.03	N/A	EFT2013091	Call
1	1	1/4-28	3	30	Stainless Steel	4.10	4.70	1.500	3.72	0.50	0.094	0.62	N/A	EFT3012091	Call
2	1	N/A	75	20	Nickel	3.78	3.47	1.500	2.78	0.50	0.25	0.59	N/A	EFT2011251	Call
2	1	N/A	150	20	Copper	3.78	3.47	1.500	2.78	0.50	0.25	0.59	N/A	EFT2013251	Call
2	1	1/4-28	3	20	Stainless Steel	3.57	5.31	1.500	3.19	0.50	0.094	N/A	N/A	EFT2512091	Call
2	1	1/4-28	55	30	Copper	4.10	4.70	1.500	3.72	0.50	0.094	0.62	N/A	EFT3013091	Call
2	1	1/2-13	3	60	Stainless Steel	7.82	4.61	3.250	6.82	0.60	0.156	0.86	N/A	EFT6012151	Call
2	1	1/2-13	100	70	Copper	8.00	4.80	3.250	7.00	0.73	0.156	0.90	N/A	EFT7013151	Call
3	2	1/4-28	30	25	Copper	4.04	1.82	1.500	3.66	0.50	0.094	0.70	0.88	EFT2523091	Call
4	3	1/4-28	3	25	Stainless Steel	4.00	2.37	1.500	3.62	0.50	0.094	0.70	0.88	EFT2532091	Call
4	3	1/4-28	30	25	Copper	4.00	2.37	1.500	3.62	0.50	0.094	0.70	0.88	EFT2533091	Call

Refer to Connectors & Cabling, starting on page 3-113, for inline barrel connectors, set screw connectors, crimp/solder connectors, bare wire, wire beads, and ceramic wire discs.

➤ 20,000+ Volts

■ KF (QF) Flanged

Voltages: 20,000; 25,000; 30,000

Amperage: 2; 15; 30; 75; 150

3
Feedthroughs

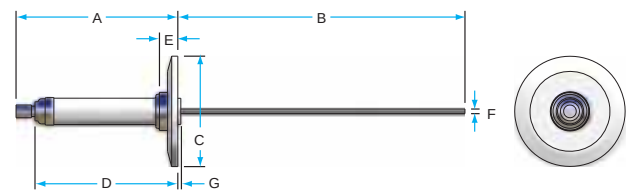


Figure 1 (1 pin)

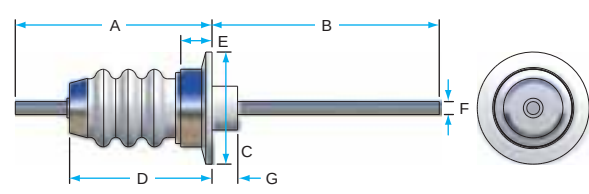


Figure 2 (1 pin)

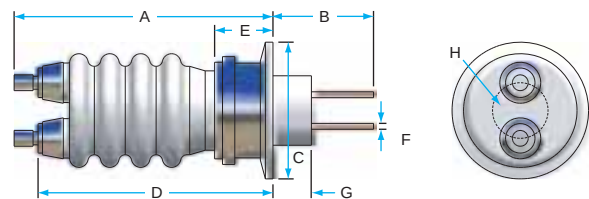


Figure 3 (2 pins)

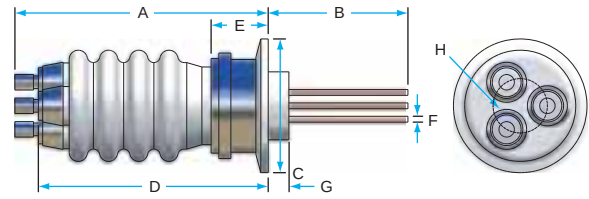


Figure 4 (3 pins)

Figure	Flange Size	# of Pins	Atm. Side Thread	Amps/ Pin	Voltage (kV)	Conductor Material	Dimensions (in.)								Part No.	Price
							A	B	C	D	E	F	G	H		
1	KF16	1	1/4-28	15	20	Nickel	3.17	5.63	1.18	2.80	0.29	0.092	0.03	N/A	EFT2011098	Call
1	KF40	1	1/4-28	15	20	Nickel	3.17	5.63	2.16	2.80	0.29	0.092	0.03	N/A	EFT2011098B	Call
1	KF40	1	1/4-28	2	20	Stainless Steel	3.17	5.63	2.16	2.80	0.29	0.092	0.03	N/A	EFT2012098B	Call
2	KF40	1	N/A	75	20	Nickel	3.78	3.47	2.16	2.78	0.50	0.25	0.59	N/A	EFT2011258B	Call
2	KF40	1	N/A	150	20	Copper	3.78	3.47	2.16	2.78	0.50	0.25	0.59	N/A	EFT2013258B	Call
2	KF40	1	1/4-28	3	25	Stainless Steel	3.57	5.31	2.16	3.19	0.50	0.094	N/A	N/A	EFT2512098B	Call
2	KF40	1	1/4-28	3	30	Stainless Steel	4.10	4.70	2.16	3.72	0.50	0.094	0.62	N/A	EFT3012098B	Call
3	KF40	2	1/4-28	30	25	Copper	4.04	1.82	2.16	3.66	0.50	0.094	0.70	0.88	EFT2523098B	Call
4	KF40	3	1/4-28	30	25	Copper	4.00	2.37	2.16	3.62	0.50	0.094	0.70	0.88	EFT2533098B	Call

Refer to Connectors & Cabling, starting on page 3-113, for inline barrel connectors, set screw connectors, crimp/solder connectors, bare wire, wire beads, and ceramic wire discs.

➤ **20,000+ Volts**

■ **CF Flanged**

Voltages: 20,000; 25,000; 30,000; 50,000; 60,000; 100,000

Amperage: 2; 3; 15; 30; 75; 100; 150

3

Feedthroughs

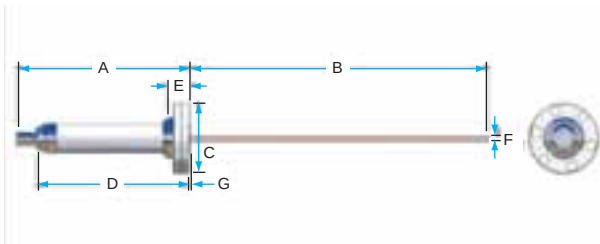


Figure 1 (1 pin)

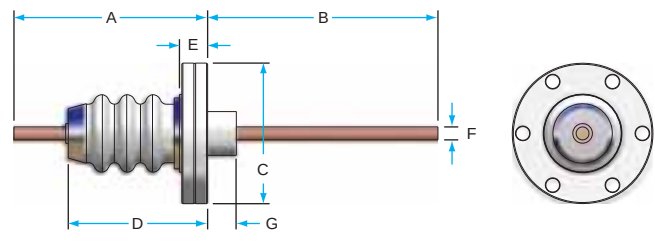


Figure 2 (1 pin)

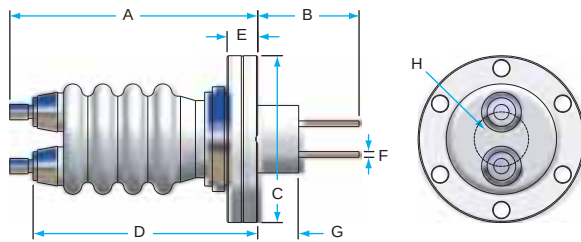


Figure 3 (2 pins)

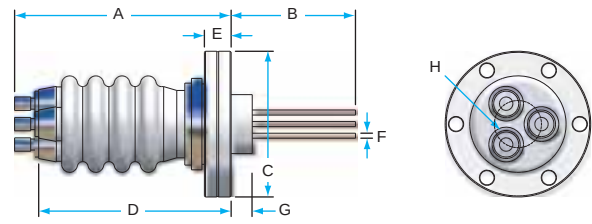


Figure 4 (3 pins)

Figure	Flange Size	# of Pins	Atm. Side Thread	Amps/ Pin	Voltage (kV)	Material	Dimensions (in.)								Part No.	Price
							A	B	C	D	E	F	G	H		
1	1.33" CF	1	1/4-28	15	20	Nickel	3.67	5.13	1.33	3.30	0.79	0.092	0.03	N/A	EFT2011092	Call
1	1.33" CF	1	1/4-28	30	20	Copper	3.67	5.13	1.33	3.30	0.79	0.092	0.03	N/A	EFT2013092	Call
1	2.75" CF	1	1/4-28	2	20	Stainless Steel	3.17	5.63	2.75	2.80	0.50	0.092	0.03	N/A	EFT2012093	Call
2	2.75" CF	1	N/A	75	20	Nickel	3.78	3.47	2.75	2.78	0.50	0.25	0.59	N/A	EFT2011253	Call
2	2.75" CF	1	N/A	150	20	Copper	3.78	3.47	2.75	2.78	0.50	0.25	0.59	N/A	EFT2013253	Call
2	2.75" CF	1	1/4-28	3	25	Stainless Steel	3.57	5.31	2.75	3.19	0.50	0.094	N/A	N/A	EFT2512093	Call
2	2.75" CF	1	1/4-28	3	30	Stainless Steel	4.10	4.70	2.75	3.72	0.50	0.094	0.62	N/A	EFT3012093	Call
2	2.75" CF	1	1/4-28	55	30	Copper	4.10	4.70	2.75	3.72	0.50	0.094	0.62	N/A	EFT3013093	Call
2	4.5" CF	1	1/2-13	3	60	Stainless Steel	7.82	4.61	4.50	6.82	0.68	0.156	0.86	N/A	EFT6012156	Call
2	6" CF	1	1/2-13	3	60	Stainless Steel	7.82	4.61	6.00	6.82	0.78	0.156	0.86	N/A	EFT6012156A	Call
3	2.75" CF	2	1/4-28	30	25	Copper	4.04	1.82	2.75	3.66	0.50	0.094	0.70	0.88	EFT2523093	Call
4	2.75" CF	3	1/4-28	30	25	Copper	4.00	2.37	2.75	3.62	0.50	0.094	0.70	0.88	EFT2533093	Call
4	6" CF	3	1/4-28	30	25	Copper	4.00	2.37	6.00	3.62	0.78	0.094	0.70	0.88	EFT2533096A	Call

Refer to Connectors & Cabling, starting on page 3-113, for inline barrel connectors, set screw connectors, crimp/solder connectors, bare wire, wire beads, and ceramic wire discs.

➤ RF Power Feedthroughs

■ Weldable

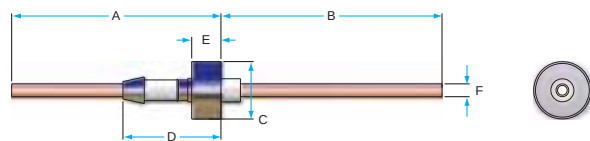


Figure 1 (1 tube)

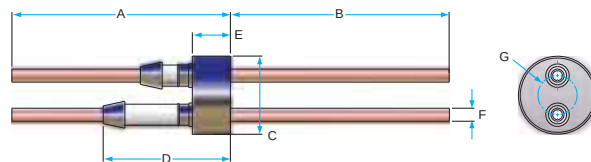


Figure 2 (2 tubes)

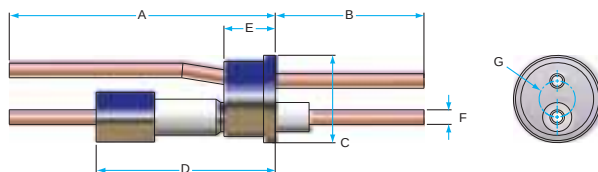


Figure 3 (2 tubes)

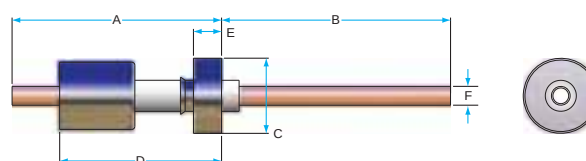


Figure 4 (1 tube)

Figure	# of Tubes	Voltage (kV)	Conductor Material	Power (kW)	Frequency	Dimensions (in.)							Part No.	Price
1	1	8	Copper	10	450kHz	A	B	C	D	E	F	G	FTT0813251	Call
2	2	8	Copper	10	450kHz	4.19	4.20	1.50	2.44	0.73	0.25	0.75	FTT0823251	Call
3	2	10	Copper	20	13.56MHz	4.56	2.55	1.50	3.07	0.88	0.25	0.80	FTT1023251	Call
4	1	10	Copper	35	13.56MHz	4.18	4.57	1.50	3.23	0.56	0.375	N/A	FTT1013371	Call

■ CF Flanged

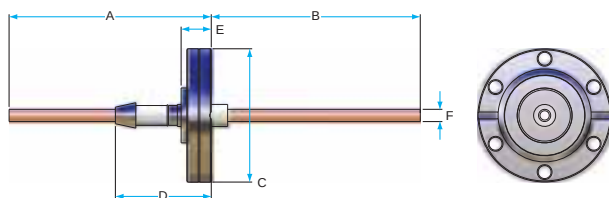


Figure 1 (1 tube)

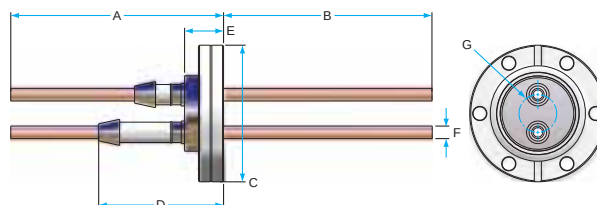


Figure 2 (2 tubes)

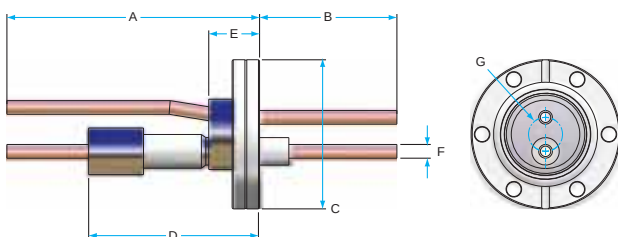


Figure 3 (2 tubes)

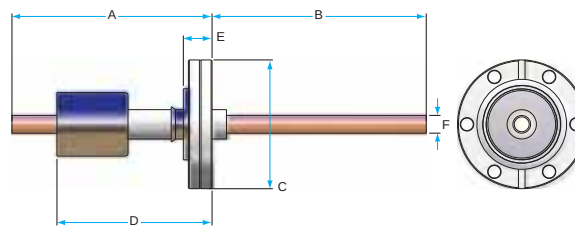


Figure 4 (1 tube)

Figure	Flange Size	# of Tubes	Voltage (kV)	Conductor Material	Power (kW)	Frequency	Dimensions (in.)							Part No.	Price
1	2.75" CF	1	8	Copper	10	450kHz	A	B	C	D	E	F	G	FTT0813253	Call
2	2.75" CF	2	8	Copper	10	450kHz	4.25	4.14	2.75	2.50	0.73	0.25	0.75	FTT0823253	Call
3	2.75" CF	2	10	Copper	20	13.56MHz	4.61	2.50	2.75	3.12	0.93	0.25	0.80	FTT1023253	Call
4	2.75" CF	1	10	Copper	35	13.56MHz	4.23	4.52	2.75	3.25	0.56	0.375	N/A	FTT1013373	Call

➤ RF Power Feedthroughs

■ KF (QF) Flanged

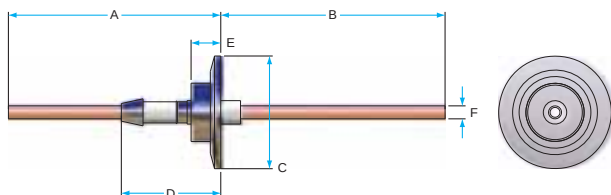


Figure 1 (1 tube)

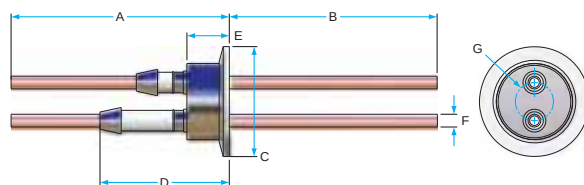


Figure 2 (2 tubes)

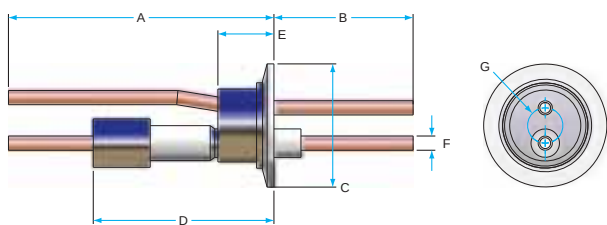


Figure 3 (2 tubes)

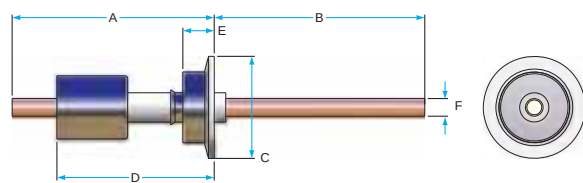


Figure 4 (1 tube)

Figure	Flange Size	# of Tubes	Voltage (kV)	Conductor Material	Power (kW)	Frequency	Dimensions (in.)							Part No.	Price
1	KF40	1	8	Copper	10	450kHz	A	B	C	D	E	F	G	FTT0813258B	Call
2	KF40	2	8	Copper	10	450kHz	4.08	4.31	2.16	1.91	0.57	0.25	N/A	FTT0823258B	Call
3	KF40	2	10	Copper	20	13.56MHz	4.29	4.10	2.16	2.54	0.83	0.25	0.75	FTT1023258B	Call
4	KF40	1	10	Copper	35	13.56MHz	4.65	2.45	2.16	3.16	0.97	0.25	0.80	FTT1013378B	Call
							4.18	4.57	2.95	3.23	0.56	0.375	N/A		Call

3

Feedthroughs

Did You Know?

We are a leading manufacturer of Thin Film Deposition Tools for Solar.

OPVs

CPVs

CIS/CIGS

Se Evap Source

Thin Film PV

➤ **BNC Feedthroughs****IN THIS SECTION ➤**
BNC Feedthroughs

Bayonet navel connector (BNC) coaxial feedthroughs:

- Feature grounded or floating shields
- Designed and rated for use in high vacuum and UHV applications
- Single-ended assemblies come with one air-side cable connector but without vacuum-side connectors. Optional push-on contacts and vacuum-compatible cables are available
- Double-ended assemblies come with air-side connector only

SPECIFICATIONS

Impedance*: 48–52 ohms

Conductor: Stainless Steel

Insulator: Alumina

Cable: RG-58U

Connection: Bayonet

Vacuum Application: HV or UHV

Temperature:

Weld Adapter, CF: -200° C to +450° C

KF, O-Ring, NPT: To +150° C

Max. Ramp Rate: 25° C/minute

Cable Connectors: -65° C to +165° C

**NOTE: Standard feedthroughs are unmatched. 50-ohm matched impedance connectors are available at an additional cost.*

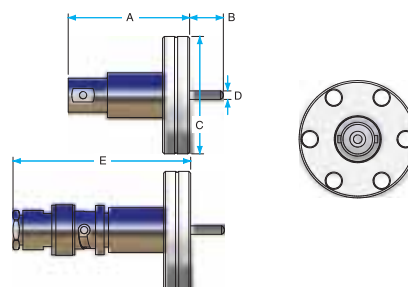
■ **CF Flange, Single-Ended**

Figure 1 (Grounded, 1 pin)

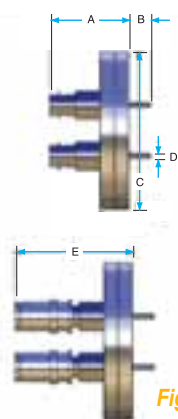


Figure 2 (Grounded, 2 pins)

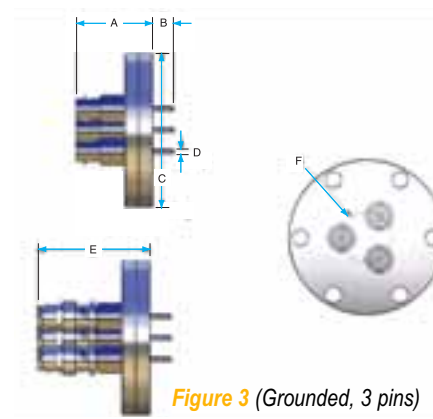


Figure 3 (Grounded, 3 pins)

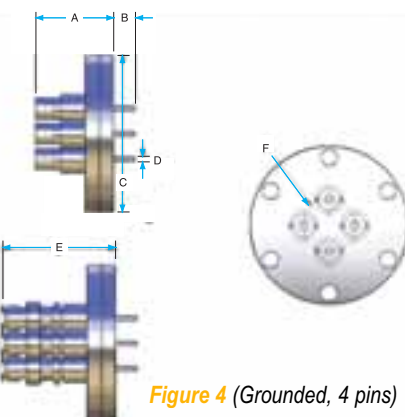


Figure 4 (Grounded, 4 pins)

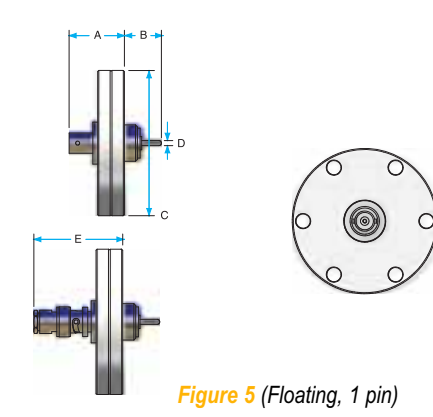


Figure 5 (Floating, 1 pin)

Figure	# of Pins	Conductor Material	Shield	Flange Size	Voltage (DC)	Amps/Pin	Dimensions (in.)						Part No.	Price
1	1	Stainless Steel	Grounded	1.33" CF	500V	3	1.33	0.40	1.33	0.094	2.00	N/A	IFTBG012032	Call
1	1	Stainless Steel	Grounded	2.75" CF	500V	3	1.33	0.40	2.75	0.094	2.00	N/A	IFTBG012033	Call
2	2	Stainless Steel	Grounded	2.75" CF	500V	3	1.33	0.40	2.75	0.094	2.00	0.87	IFTBG022033	Call
3	3	Stainless Steel	Grounded	2.75" CF	500V	3	1.33	0.40	2.75	0.094	2.00	0.87	IFTBG032033	Call
4	4	Stainless Steel	Grounded	2.75" CF	500V	3	1.33	0.40	2.75	0.094	2.00	0.95	IFTBG042033	Call
5	1	Stainless Steel	Floating	1.33" CF	2500V	3	2.70	0.42	1.33	0.094	3.37	N/A	IFTBF012032	Call
5	1	Stainless Steel	Floating	2.75" CF	2500V	3	0.89	0.84	2.75	0.094	1.56	N/A	IFTBF012033	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, 1/8" & 1/4" cables, bare wire, and wire beads.

➤ BNC Feedthroughs

■ Weldable, Single-Ended

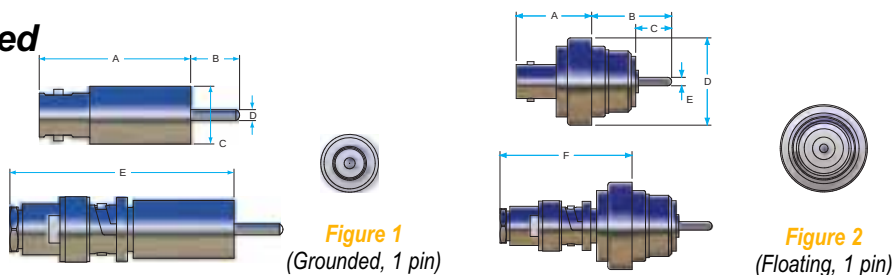


Figure	# of Pins	Conductor Material	Shield	Voltage (DC)	Amps/Pin	Dimensions (in.)						Part No.	Price
1	1	Stainless Steel	Grounded	500V	3	1.33	0.40	0.495	0.094	2.00	N/A	IFTBG012031	Call
2	1	Stainless Steel	Floating	2500V	3	0.89	0.84	0.40	0.97	0.094	1.56	IFTBF012031	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, 1/8" & 1/4" cables, bare wire, and wire beads.

■ KF (QF) Flange, Single-Ended

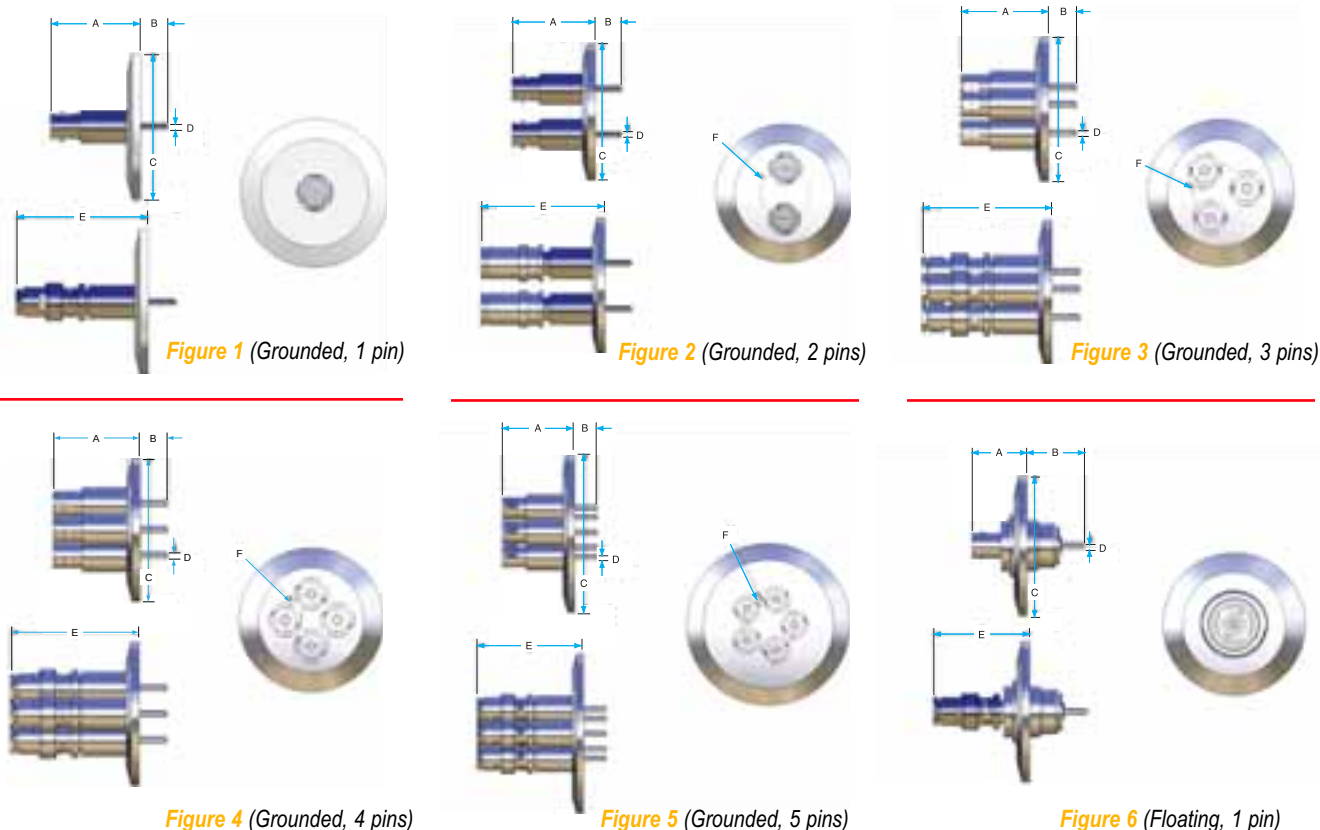


Figure	# of Pins	Conductor Material	Shield	Flange Size	Voltage (DC)	Amps/Pin	Dimensions (in.)						Part No.	Price
1	1	Stainless Steel	Grounded	KF16	500V	3	1.33	0.40	1.18	0.094	2.00	N/A	IFTBG012038	Call
1	1	Stainless Steel	Grounded	KF40	500V	3	1.33	0.40	2.16	0.094	2.00	N/A	IFTBG012038B	Call
2	2	Stainless Steel	Grounded	KF40	500V	3	1.33	0.40	2.16	0.094	2.00	0.78	IFTBG022038B	Call
3	3	Stainless Steel	Grounded	KF40	500V	3	1.33	0.40	2.16	0.094	2.00	0.78	IFTBG032038B	Call
3	3	Stainless Steel	Grounded	KF50	500V	3	1.33	0.40	2.95	0.094	2.00	0.87	IFTBG032038C	Call
4	4	Stainless Steel	Grounded	KF40	500V	3	1.33	0.40	2.16	0.094	2.00	0.95	IFTBG042038B	Call
4	4	Stainless Steel	Grounded	KF50	500V	3	1.33	0.40	2.95	0.094	2.00	0.95	IFTBG042038C	Call
5	5	Stainless Steel	Grounded	KF50	500V	3	1.33	0.40	2.95	0.094	2.00	0.95	IFTBG052038C	Call
6	1	Stainless Steel	Floating	KF16	2500V	3	2.70	0.50	1.18	0.094	3.34	N/A	IFTBF012038	Call
6	1	Stainless Steel	Floating	KF40	2500V	3	0.89	0.84	2.16	0.094	1.56	N/A	IFTBF012038B	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, 1/8" & 1/4" cables, bare wire, and wire beads.

➤ **BNC Feedthroughs****SPECIFICATIONS**for Single-Ended Baseplate,
NPT (M) & Weldable**Maximum Voltage:**

Grounded Shield: 500 VDC

Floating Shield: Shield-Ground: 2,500 VDC

Floating Shield: Shield-Pin: 500 VDC

Maximum Current: 3A**Impedance*:** 48–52 ohms**Conductor:** Stainless Steel**Insulator:** Alumina**Cable:** RG-58U**Connection:** Bayonet**Vacuum Application:** HV or UHV**Temperature:**

Weld Adapter, CF: -200° C to +450° C

KF, O-Ring, NPT: To +150° C

Max. Ramp Rate: 25° C/minute

Cable Connectors: -65° C to +165° C

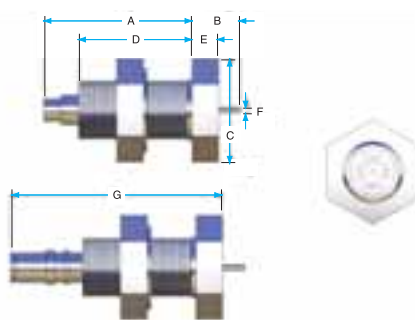
■ **Baseplate, Single-Ended**

Figure 1 (Grounded, 1 pin)

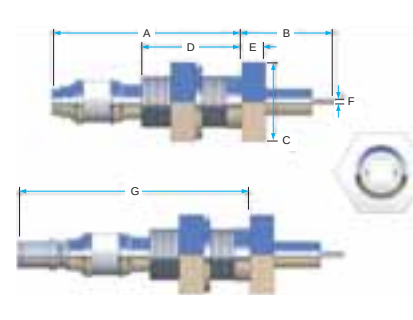


Figure 2 (Floating, 1 pin)

NOTE: Standard feedthroughs are unmatched. 50-ohm matched impedance connectors are available at additional cost.

Figure	# of Pins	Conductor Material	Mounting	Shield	Voltage (DC)	Amps/ Pin	Dimensions (in.)							Part No.	Price
							A	B	C	D	E	F	G		
1	1	Stainless Steel	1" BP	Grounded	500V	3	2.56	0.81	1.50	1.88	0.44	0.094	3.23	IFTBG012034	Call
2	1	Stainless Steel	1" BP	Floating	2,500V	3	3.56	1.27	1.50	1.88	0.44	0.094	4.26	IFTBF012034	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, 1/8" & 1/4" cables, bare wire, and wire beads.

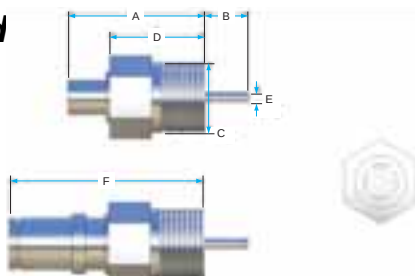
■ **NPT (M), Single-Ended**

Figure 1 (Grounded, 1 pin)

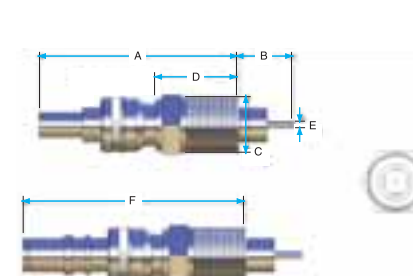


Figure 2 (Floating, 1 pin)

Figure	# of Pins	Conductor		Mounting	Volts (DC)	Amps/Pin	Dimensions (in.)							Part No.	Price
		Material	Shield				A	B	C	D	E	F			
1	1	Stainless Steel	Grounded	3/8" NPT	500V	3	1.33	0.40	0.68	0.89	0.094	2.00	IFTBG012035	Call	
2	1	Stainless Steel	Floating	1/2" NPT	2,500V	3	2.89	0.81	0.84	1.20	0.094	3.59	IFTBF012035	Call	

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, 1/8" & 1/4" cables, bare wire, and wire beads.

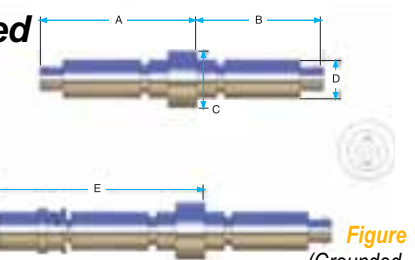
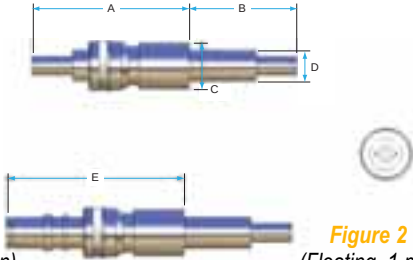
■ **Weldable, Double-Ended**Figure 1
(Grounded, 1 pin)Figure 2
(Floating, 1 pin)

Figure	# of Pins	Conductor Material	Shield	Voltage (DC)	Amps/ Pin	Impedance	Dimensions (in.)					Part No.	Price
							A	B	C	D	E		
1	1	Stainless Steel	Grounded	500V	3	Unmatched	2.03	1.63	0.745	0.50	2.70	IFDBG012031	Call
1	1	Stainless Steel	Grounded	500V	3	Matched 50 Ohm	0.89	0.64	0.622	0.50	1.56	IFDBG012031M	Call
2	1	Stainless Steel	Floating	2500V	3	Unmatched	2.46	1.71	0.747	0.50	3.13	IFDBF012031	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, 1/8" and 1/4" cables.

➤ BNC Feedthroughs

■ CF Flange, Double-Ended

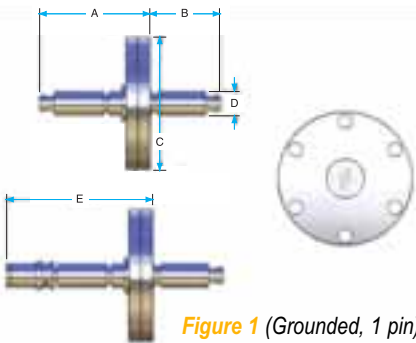


Figure 1 (Grounded, 1 pin)

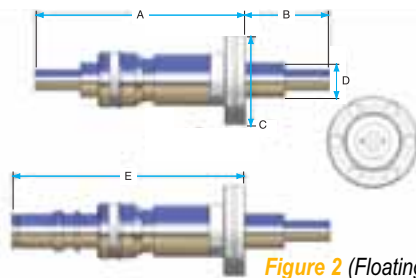


Figure 2 (Floating, 1 pin)

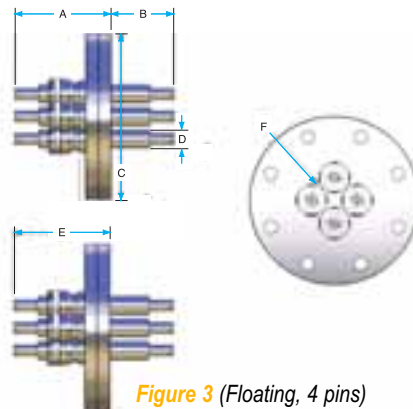


Figure 3 (Floating, 4 pins)

SPECIFICATIONS

for Double-Ended CF & KF Flange

Maximum Voltage:

Grounded Shield: 500 VDC

Floating Shield: Shield-Ground: 2,500 VDC

Floating Shield: Shield-Pin: 500 VDC

Maximum Current: 3A

Conductor: Stainless Steel

Insulator: Alumina

Cable: RG-58U

Connection: Bayonet

Vacuum Application: HV or UHV

Temperature:

Weld Adapter, CF: -200° C to +450° C

KF, O-Ring, NPT: To +150° C

Max. Ramp Rate: 25° C/minute

Cable Connectors: -65° C to +165° C

3

Feedthroughs

Figure	# of Pins	Conductor Material	Shield	Flange Size	Voltage (DC)	Amps/ Pin	Impedance	Dimensions (in.)						Part Number	Price
1	1	Stainless Steel	Grounded	1.33" CF	500	3	Unmatched	2.53	1.13	1.33	0.50	3.20	N/A	IFDBG012032	Call
1	1	Stainless Steel	Grounded	2.75" CF	500	3	Unmatched	2.03	1.63	2.75	0.50	2.70	N/A	IFDBG012033	Call
1	1	Stainless Steel	Grounded	3.375" CF	500	3	Unmatched	2.03	1.63	3.375	0.50	2.70	N/A	IFDBG012033A	Call
1	1	Stainless Steel	Grounded	1.33" CF	500	3	Matched 50 Ohm	0.89	0.64	1.33	0.50	1.56	N/A	IFDBG012032M	Call
1	1	Stainless Steel	Grounded	2.75" CF	500	3	Matched 50 Ohm	0.89	0.64	2.75	0.50	1.56	N/A	IFDBG012033M	Call
2	1	Stainless Steel	Floating	1.33" CF	2500	3	Unmatched	2.96	1.21	1.33	0.50	3.63	N/A	IFDBF012032	Call
2	1	Stainless Steel	Floating	2.75" CF	2500	3	Unmatched	2.46	1.71	2.75	0.50	3.13	N/A	IFDBF012033	Call
3	4	Stainless Steel	Floating	4.5" CF	2500	3	Unmatched	2.46	1.71	4.50	0.50	3.13	1.20	IFDBF042036	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, 1/8" and 1/4" cables.

■ KF (QF) Flange, Double-Ended

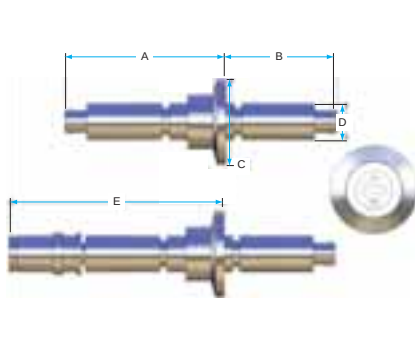


Figure 1 (Grounded, 1 pin)

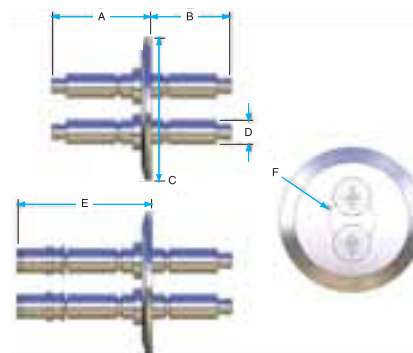


Figure 2 (Grounded, 2 pins)

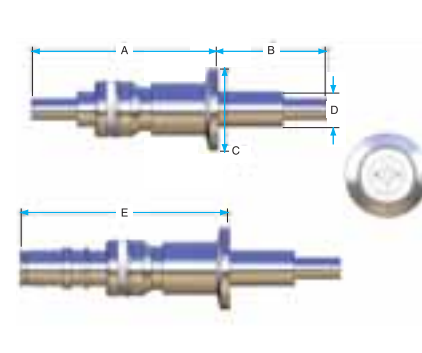


Figure 3 (Floating, 1 pin)

Figure	# of Pins	Conductor Material	Shield	Flange Size	Voltage (DC)	Amps/ Pin	Impedance	Dimensions (in.)						Part No.	Price
1	1	Stainless Steel	Grounded	KF16	500	3	Unmatched	2.03	1.63	1.18	0.50	2.70	N/A	IFDBG012038	Call
1	1	Stainless Steel	Grounded	KF25	500	3	Unmatched	2.03	1.63	1.57	0.50	2.70	N/A	IFDBG012038A	Call
1	1	Stainless Steel	Grounded	KF40	500	3	Unmatched	2.03	1.63	2.16	0.50	2.70	N/A	IFDBG012038B	Call
1	1	Stainless Steel	Grounded	KF50	500	3	Unmatched	2.03	1.63	2.95	0.50	2.70	N/A	IFDBG012038C	Call
2	2	Stainless Steel	Grounded	KF50	500	3	Unmatched	2.03	1.63	2.95	0.50	2.70	0.95	IFDBG022038C	Call
3	1	Stainless Steel	Floating	KF16	2500	3	Unmatched	2.46	1.71	1.18	0.50	3.13	N/A	IFDBF012038	Call
3	1	Stainless Steel	Floating	KF25	2500	3	Unmatched	2.46	1.71	1.57	0.50	3.13	N/A	IFDBF012038A	Call
3	1	Stainless Steel	Floating	KF40	2500	3	Unmatched	2.46	1.71	2.16	0.50	3.13	N/A	IFDBF012038B	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, 1/8" and 1/4" cables.

BNC Feedthroughs

SPECIFICATIONS

for Double-Ended
Baseplate & NPT (M)

- Maximum Voltage:
 - Grounded Shield: 500 VDC
 - Floating Shield: Shield-Ground: 2,500 VDC
 - Floating Shield: Shield-Pin: 500 VDC
- Maximum Current: 3A
- Conductor: Stainless Steel
- Insulator: Alumina
- Cable: RG-58U
- Connection: Bayonet
- Vacuum Application: HV or UHV
- Temperature:
 - Weld Adapter, CF: -200° C to +450° C
 - KF, O-Ring, NPT: to +150° C
 - Max. Ramp Rate: 25° C/minute
 - Cable Connectors: -65° C to +165° C

Baseplate, Double-Ended

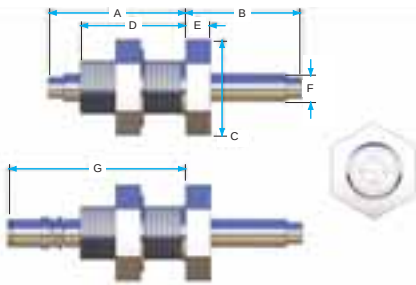


Figure 1 (Grounded, 1 pin)

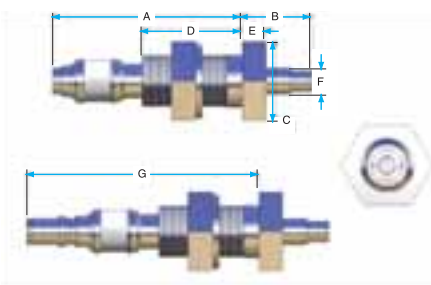


Figure 2 (Floating, 1 pin)

Figure	# of Pins	Conductor Material	Shield	Voltage (DC)	Amps/ Pin	Mounting	Dimensions (in.)							Part No.	Price
1	1	Stainless Steel	Grounded	500V	3	1" BP	A	B	C	D	E	F	G	IFDBG012034	Call
2	1	Stainless Steel	Floating	2500V	3	1" BP	A	B	C	D	E	F	G	IFDBF012034	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, 1/8" and 1/4" cables.

NPT (M), Double-Ended

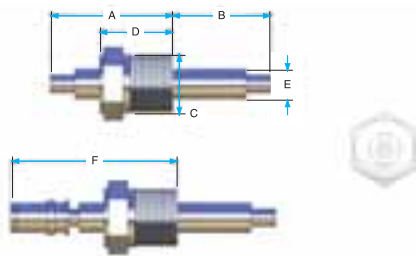


Figure 1 (Grounded, 1 pin)

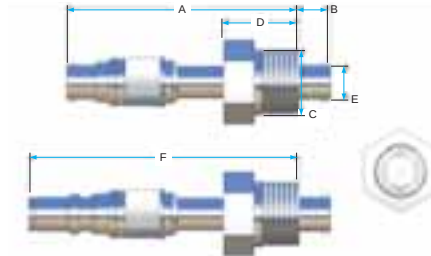


Figure 2 (Floating, 1 pin)

Figure	# of Pins	Conductor Material	Shield	Voltage (DC)	Amps/ Pin	Mounting	Dimensions (in.)							Part No.	Price
1	1	Stainless Steel	Grounded	500V	3	3/4" NPT	A	B	C	D	E	F		IFDBG012035	Call
2	1	Stainless Steel	Floating	2500V	3	1/2" NPT	A	B	C	D	E	F		IFDBF012035	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, 1/8" and 1/4" cables.

➤ Miniature High Voltage (MHV)

IN THIS SECTION ➤

MHV

- Feature grounded or floating shields
- Designed and rated for use in high vacuum and UHV applications
- Suitable for cryogenic temperatures
- Single-ended assemblies come with one air-side cable connector, without vacuum-side connectors. Options include power push-on contacts and vacuum cable assemblies
- Double-ended assemblies come with air-side connectors only

NOTE: Do not crossmate MHV feedthroughs with BNC feedthroughs. MHV feedthroughs are rated at higher voltages.

SPECIFICATIONS

for Single-Ended Weldable & CF Flange

Maximum Voltage:

Grounded Shield: 5,000 VDC

Floating Shield: Shield-Ground: 2,500 VDC

Floating Shield: Shield-Pin: 5,000 VDC

Maximum Current: 3A

Conductor: Stainless Steel

Insulator: Alumina

Cable: RG-59U

Connection: Bayonet

Vacuum Application: HV or UHV

Temperature:

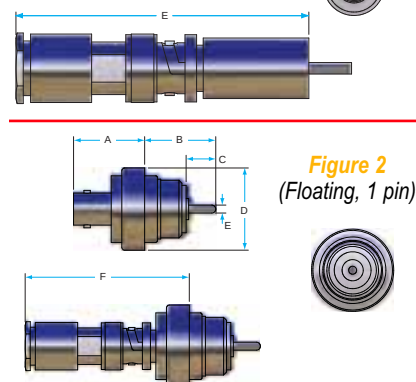
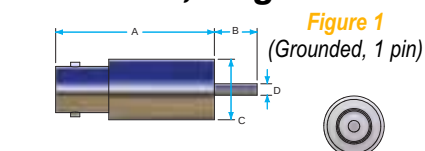
Weld Adapter, CF: -200° C to +450° C

KF, O-Ring, NPT: to +150° C

Max. Ramp Rate: 25° C/minute

Cable Connectors: -65° C to +165° C

■ Weldable, Single-Ended



3

Feedthroughs

Figure	# of Pins	Conductor Material	Shield	Voltage (DC)	Amps/Pin	Dimensions (in.)						Part No.	Price
1	1	Stainless Steel	Grounded	5kV	3	1.33	0.35	0.495	0.094	2.00	N/A	IFTMG012031	Call
2	1	Stainless Steel	Floating	2500kV	3	0.84	0.84	0.35	0.97	0.094	1.51	IFTMF012031	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, 1/8" & 1/4" cables, bare wire, and wire beads.

■ CF Flange, Single-Ended

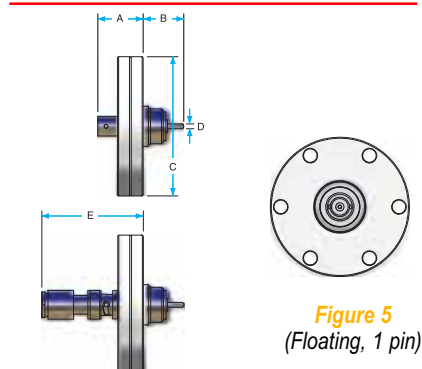
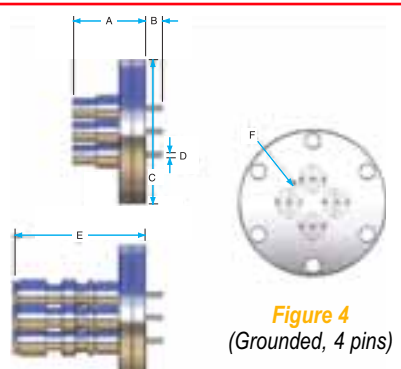
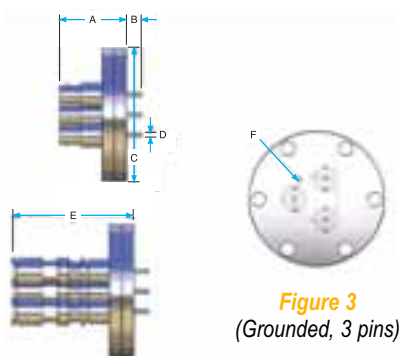
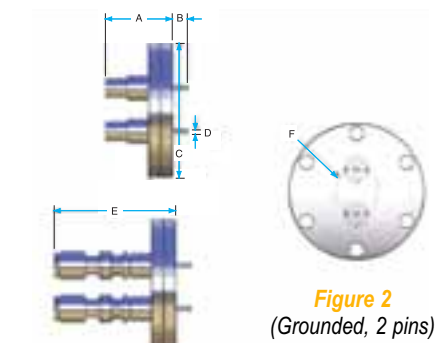
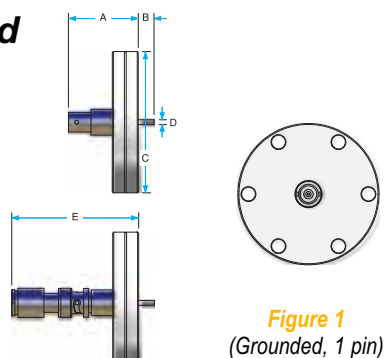


Figure	# of Pins	Conductor Material	Shield	Flange Size	Voltage (DC)	Amps/Pin	Dimensions (in.)						Part No.	Price
1	1	Stainless Steel	Grounded	1.33" CF	5kV	3	1.33	0.35	1.33	0.094	2.00	N/A	IFTMG012032	Call
1	1	Stainless Steel	Grounded	2.75" CF	5kV	3	1.33	0.35	2.75	0.094	2.00	N/A	IFTMG012033	Call
2	2	Stainless Steel	Grounded	2.75" CF	5kV	3	1.33	0.35	2.75	0.094	2.00	0.87	IFTMG022033	Call
3	3	Stainless Steel	Grounded	2.75" CF	5kV	3	1.33	0.35	2.75	0.094	2.00	0.87	IFTMG032033	Call
4	4	Stainless Steel	Grounded	2.75" CF	5kV	3	1.33	0.35	2.75	0.094	2.00	0.95	IFTMG042033	Call
5	1	Stainless Steel	Floating	1.33" CF	2500V	3	2.70	0.42	1.33	0.094	3.37	N/A	IFTMF012032	Call
5	1	Stainless Steel	Floating	2.75" CF	2500V	3	0.84	0.84	2.75	0.094	1.51	N/A	IFTMF012033	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, 1/8" & 1/4" cables, bare wire, and wire beads.

➤ **Miniature High Voltage (MHV)****SPECIFICATIONS**for Single-Ended Weldable
& CF Flange**Maximum Voltage:**

Grounded Shield: 5,000 VDC

Floating Shield: Shield-Ground: 2,500 VDC

Floating Shield: Shield-Pin: 5,000 VDC

Maximum Current: 3A

Conductor: Stainless Steel

Insulator: Alumina

Cable: RG-59U

Connection: Bayonet

Vacuum Application: HV or UHV

Temperature:

Weld Adapter, CF: -200° C to +450° C

KF, O-Ring, NPT: to +150° C

Max. Ramp Rate: 25° C/minute

Cable Connectors: -65° C to +165° C

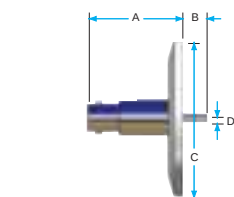
■ **KF (QF) Flange, Single-Ended**

Figure 1 (Grounded, 1 pin)

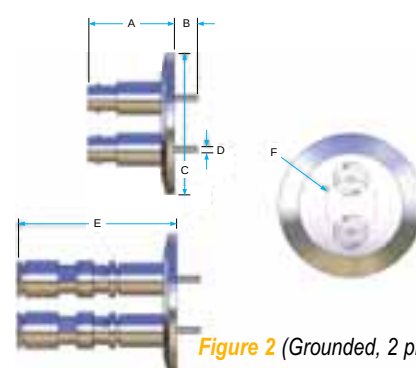


Figure 2 (Grounded, 2 pins)

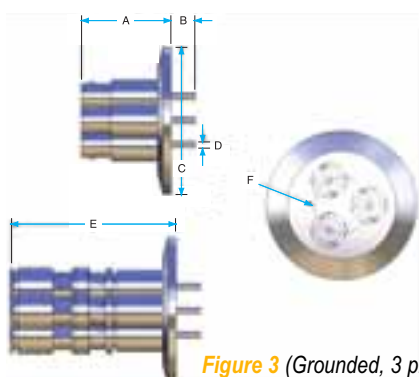


Figure 3 (Grounded, 3 pins)

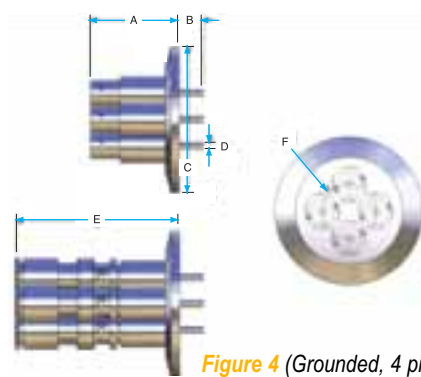


Figure 4 (Grounded, 4 pins)

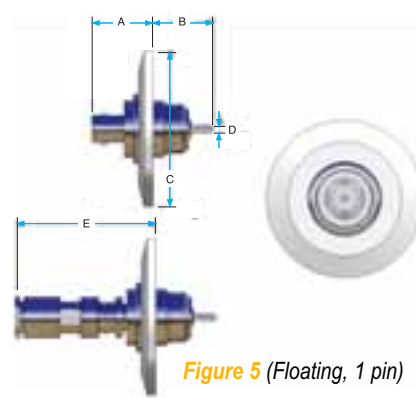


Figure 5 (Floating, 1 pin)

Figure	# of Pins	Conductor Material	Shield	Flange Size	Voltage (DC)	Amps/ Pin	Dimensions (in.)						Part No.	Price
							A	B	C	D	E	F		
1	1	Stainless Steel	Grounded	KF16	5kV	3	1.33	0.35	1.18	0.094	2.00	N/A	IFTMG012038	Call
1	1	Stainless Steel	Grounded	KF40	5kV	3	1.33	0.35	2.16	0.094	2.00	N/A	IFTMG012038B	Call
2	2	Stainless Steel	Grounded	KF40	5kV	3	1.33	0.35	2.16	0.094	2.00	0.78	IFTMG022038B	Call
3	3	Stainless Steel	Grounded	KF40	5kV	3	1.33	0.35	2.16	0.094	2.00	0.78	IFTMG032038B	Call
3	3	Stainless Steel	Grounded	KF50	5kV	3	1.33	0.35	2.95	0.094	2.00	0.87	IFTMG032038C	Call
4	4	Stainless Steel	Grounded	KF40	5kV	3	1.33	0.35	2.16	0.094	2.00	0.95	IFTMG042038B	Call
4	4	Stainless Steel	Grounded	KF50	5kV	3	1.33	0.35	2.95	0.094	2.00	0.95	IFTMG042038C	Call
5	1	Stainless Steel	Floating	KF16	2500kV	3	2.59	0.61	1.18	0.094	3.74	N/A	IFTMF012038	Call
5	1	Stainless Steel	Floating	KF40	2500kV	3	0.84	0.84	2.16	0.094	1.30	N/A	IFTMF012038B	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, 1/8" & 1/4" cables, bare wire, and wire beads.

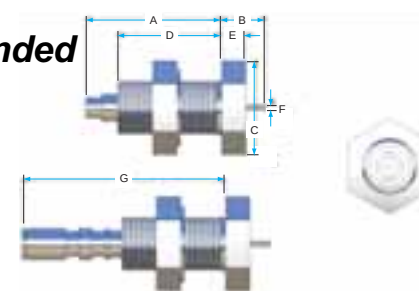
■ **1" Baseplate, Single-Ended**

Figure 1 (Grounded, 1 pin)

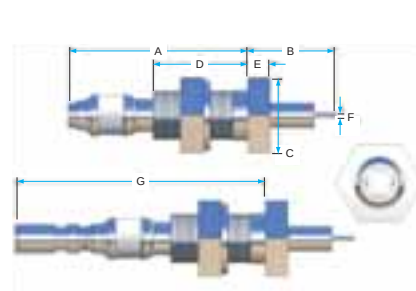


Figure 2 (Floating, 1 pin)

Figure	# of Pins	Conductor Material	Shield	Mounting	Voltage	Amps/ Pin	Dimensions (in.)							Part No.	Price
1	1	Stainless Steel	Grounded	1" BP	5kV	3	2.56	0.81	1.50	1.88	0.44	0.094	3.23	IFTMG012034	Call
2	1	Stainless Steel	Floating	1" BP	2500kV	3	3.56	1.27	1.50	1.88	0.44	0.094	4.26	IFTMF012034	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, 1/8" & 1/4" cables, bare wire, and wire beads.

➤ Miniature High Voltage (MHV)

■ NPT (M), Single-Ended

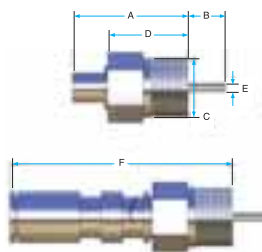


Figure 1 (Grounded, 1 pin)

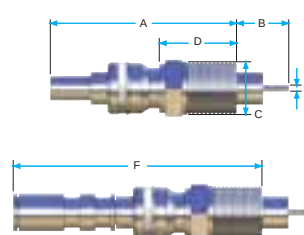


Figure 2 (Floating, 1 pin)

Figure	Mounting	# of Pins	Conductor Material	Shield	Voltage	Amps/Pin	Dimensions (in.)						Part No.	Price
1	3/8" NPT	1	Stainless Steel	Grounded	5kV	3	A	B	C	D	E	F	IFTMG012035	Call
2	1/2" NPT	1	Stainless Steel	Floating	2500kV	3	2.89	0.81	0.84	1.20	0.094	3.59	IFTMF012035	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, 1/8" & 1/4" cables, bare wire, and wire beads.

■ Weldable, Double-Ended

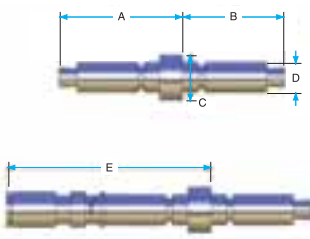


Figure 1 (Grounded, 1 pin)

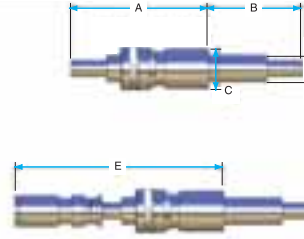


Figure 2 (Floating, 1 pin)

Figure	# of Pins	Shield	Voltage (DC)	Amps/Pin	Dimensions (in.)						Part No.	Price
1	1	Grounded	5kV	3	A	B	C	D	E		IFDMG012031	Call
2	1	Floating	2500kV	3	2.46	1.71	0.747	0.50	3.10		IFDMF012031	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, 1/8" & 1/4" cables, bare wire, and wire beads.

■ CF Flange, Double-Ended

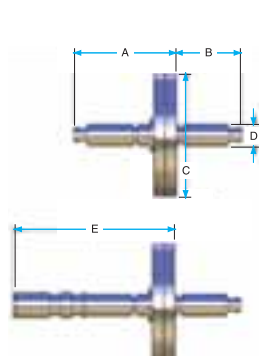


Figure 1 (Grounded, 1 pin)

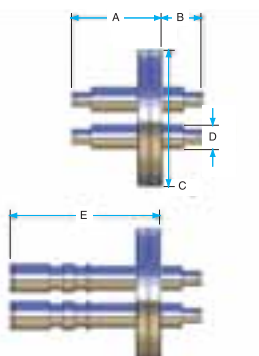


Figure 2 (Grounded, 2 pins)

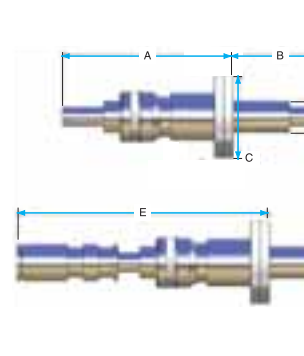


Figure 3 (Floating, 1 pin)

Figure	# of Pins	Conductor Material	Shield	Flange Size	Voltage (DC)	Amps/ Pin	Impedance	Dimensions (in.)						Part No.	Price
1	1	Stainless Steel	Grounded	1.33"CF	5kV	3	Unmatched	A	B	C	D	E	F	IFDMG012032	Call
1	1	Stainless Steel	Grounded	2.75"CF	5kV	3	Unmatched	2.03	1.63	2.75	0.50	3.18	N/A	IFDMG012033	Call
2	2	Stainless Steel	Grounded	2.75"CF	5kV	3	Unmatched	2.03	1.63	2.75	0.50	3.18	0.79	IFDMG022033	Call
3	1	Stainless Steel	Floating	1.33"CF	2500V	3	Unmatched	2.96	1.21	1.33	0.50	3.60	N/A	IFDMF012032	Call
3	1	Stainless Steel	Floating	2.75"CF	2500V	3	Unmatched	2.46	1.71	2.75	0.50	3.10	N/A	IFDMF012033	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, 1/8" & 1/4" cables.

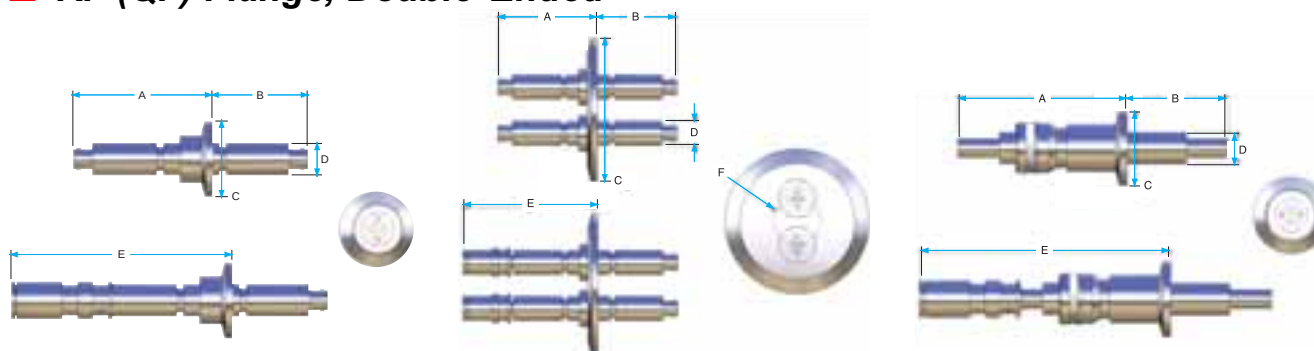
➤ **Miniature High Voltage (MHV)**■ **KF (QF) Flange, Double-Ended**

Figure 1 (Grounded, 1 pin)

Figure 2 (Grounded, 2 pins)

Figure 3 (Floating, 1 pin)

Figure	# of Pins	Conductor		Flange Size	Voltage (DC)	Amps/ Pin	Dimensions (in.)							Part No.	Price
		Material	Shield				A	B	C	D	E	F			
1	1	Stainless Steel	Grounded	KF16	5kV	3	2.03	1.63	1.18	0.50	3.18	N/A	IFDMG012038	Call	
1	1	Stainless Steel	Grounded	KF40	5kV	3	2.03	1.63	2.16	0.50	3.18	N/A	IFDMG012038B	Call	
2	2	Stainless Steel	Grounded	KF50	5kV	3	2.03	1.63	2.95	0.50	3.18	0.95	IFDMG022038C	Call	
3	1	Stainless Steel	Floating	KF16	2500kV	3	2.46	1.71	1.18	0.50	3.10	N/A	IFDMF012038	Call	
3	1	Stainless Steel	Floating	KF25	2500kV	3	2.46	1.71	1.57	0.50	3.10	N/A	IFDMF012038A	Call	
3	1	Stainless Steel	Floating	KF40	2500kV	3	2.46	1.71	2.16	0.50	3.10	N/A	IFDMF012038B	Call	

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, 1/8" & 1/4" cables.

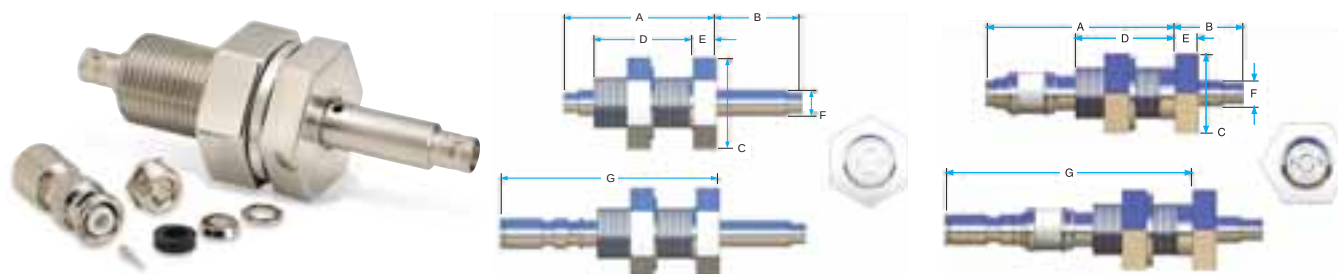
■ **1" Baseplate, Double-Ended**

Figure 1 (Grounded, 1 pin)

Figure 2 (Floating, 1 pin)

Figure	# of Pins	Conductor Material	Shield	Mounting	Voltage (DC)	Amps/ Pin	Dimensions (in.)							Part No.	Price
1	1	Stainless Steel	Grounded	1" BP	5kV	3	2.45	2.07	1.50	1.88	0.44	0.50	3.13	IFDMG012034	Call
2	1	Stainless Steel	Floating	1" BP	2500kV	3	3.56	1.31	1.50	1.88	0.44	0.50	4.26	IFDMF012034	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, 1/8" & 1/4" cables.

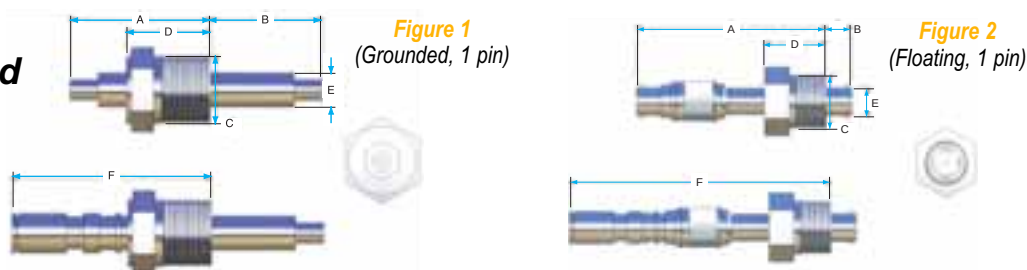
■ **NPT (M), Double-Ended**Figure 1
(Grounded, 1 pin)Figure 2
(Floating, 1 pin)

Figure	# of Pins	Conductor Material	Shield	Mounting	Voltage (DC)	Amps/ Pin	Dimensions (in.)							Part No.	Price
							A	B	C	D	E	F			
1	1	Stainless Steel	Grounded	¾" NPT	5kV	3	2.03	1.63	1.05	1.21	0.50	2.7	IFDMG012035	Call	
2	1	Stainless Steel	Floating	½" NPT	2500kV	3	2.89	1.22	0.84	1.20	0.50	3.59	IFDMF012035	Call	

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, 1/8" & 1/4" cables.

IN THIS SECTION ➤

SHV-B

Safe, High Voltage, Bakeable (SHV-B) coaxial connectors:

- Feature grounded shields
- Use a ceramic dielectric suitable for baking at 450° C
- Units excel in applications requiring the feedthrough to remain connected and operational at high temperatures
- All assemblies come with air-side cable connectors. Vacuum-side, push-on connectors only available as optional extras

SPECIFICATIONS

for Single-Ended Weldable
and CF Flange

Maximum Voltage:

Grounded Shield: 7,500 VDC

Maximum Current: 3A

Conductor: Stainless Steel

Insulator: Alumina

Cable: RG-59U

Connection: Screw Thread

Vacuum Application: HV or UHV

Temperature:

Weld Adapter, CF: -200° C to +450° C

KF, O-Ring, NPT: to +150° C

Max. Ramp Rate: 25° C/minute

Cable Connectors: -200° C to +450° C

Weldable, Single-Ended

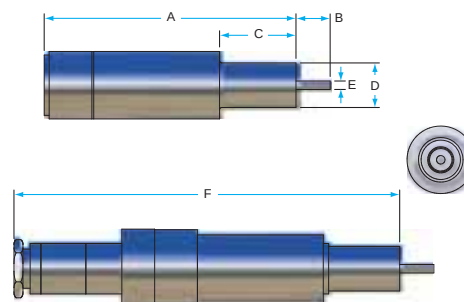


Figure 1 (Grounded, 1 pin)

Figure	# of Pins	Conductor Material	Shield	Voltage (DC)	Amps/Pin	Dimensions (in.)						Part No.	Price
						A	B	C	D	E	F		
1	1	Stainless Steel	Grounded	7.5kV	3	3.08	0.36	1.13	0.495	0.094	4.76	IFTTG012031	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, bare wire, and wire beads.

CF Flange, Single-Ended

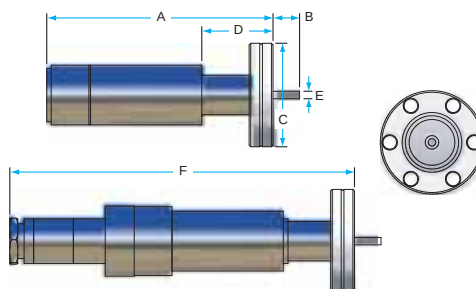


Figure 1 (Grounded, 1 pin)

Figure	# of Pins	Conductor Material	Shield	Flange Size	Voltage (DC)	Amps/Pin	Dimensions (in.)							Part No.	Price
							A	B	C	D	E	F			
1	1	Stainless Steel	Grounded	1.33" CF	7.5kV	3	3.08	0.36	1.33	1.13	0.094	4.76	IFTTG012032	Call	
1	1	Stainless Steel	Grounded	2.75" CF	7.5kV	3	3.08	0.36	2.75	1.13	0.094	4.76	IFTTG012033	Call	

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, bare wire, and wire beads.

➤ SHV-B

SPECIFICATIONS

for Single-Ended Baseplate and NPT Termination

- Maximum Voltage:
Grounded Shield: 7,500 VDC
- Maximum Current: 3A
- Conductor: Stainless Steel
- Insulator: Alumina
- Cable: RG-59U
- Connection: Screw Thread
- Vacuum Application: HV or UHV
- Temperature:
Weld Adapter, CF: -200° C to +450° C
KF, O-Ring, NPT: to +150° C
Max. Ramp Rate: 25° C/minute
Cable Connectors: -200° C to +450° C

■ Baseplate Termination, Single-Ended

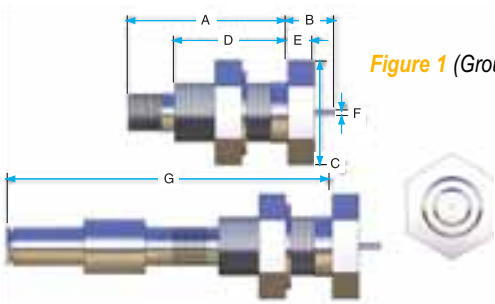


Figure 1 (Grounded, 1 pin)

Figure	# of Pins	Conductor Material	Shield	Voltage (DC)	Amps/Pin	Mounting	Dimensions (in.)							Part No.	Price
1	1	Stainless Steel	Grounded	7.5kV	3	1" BP	A	B	C	D	E	F	G	IFTTG012034	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, bare wire, and wire beads.

■ NPT Termination, Single-Ended

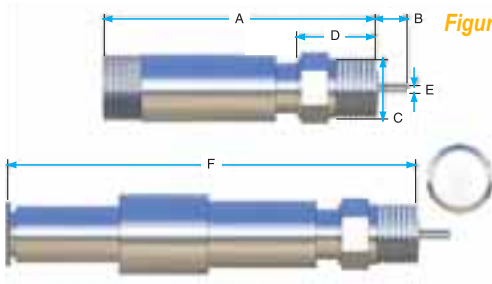


Figure 1 (Grounded, 1 pin)

Figure	# of Pins	Conductor Material	Shield	Voltage (DC)	Amps/Pin	Mounting	Dimensions (in.)							Part No.	Price
1	1	Stainless Steel	Grounded	7.5kV	3	3/8" NPT	A	B	C	D	E	F		IFTTG012035	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, bare wire, and wire beads.



- Quality Products & Services
- On-time Delivery
- Continual Improvement
- Effective Employee Training
- Customer Satisfaction



Providing Quality You Can Trust for Over 55 Years!

IN THIS SECTION ➤

SHV-5

SHV-5 feedthroughs:

- Designed and rated for use in high vacuum and UHV applications
- Constructed of vacuum-grade materials, including 304 stainless steel conductor pins and mounts, high-purity alumina ceramic insulation, and vacuum-tube-grade braze alloys
- Recessed female contacts in cable connectors reduce the possibility of electrical shock while preventing crossmating with BNC- or MHV-style components
- These coaxial assemblies have one air-side cable connector, but no vacuum-side power push-on connectors

SPECIFICATIONS

for Single-Ended Weldable and CF Flange

Maximum Voltage:

Grounded Shield: 5,000 VDC

Floating Shield: Shield-Ground: 2,500 VDC

Floating Shield: Shield-Pin: 5,000 VDC

Maximum Current: 5A

Conductor: Nickel

Insulator: Alumina

Cable: RG-59U

Connector: Bayonet

Vacuum Application: HV or UHV

Temperature:

Weld Adapter, CF: -200° C to +450° C

KF, O-Ring, NPT: to +150° C

Max. Ramp Rate: 25° C/minute

Cable Connectors: -65° C to +165° C

Weldable, Single-Ended



3

Feedthroughs

Figure 1
(Grounded, 1 pin)

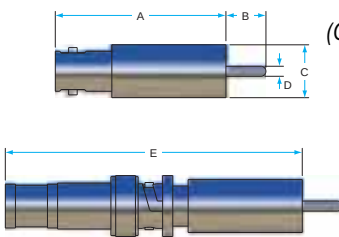


Figure 2
(Grounded, 1 pin)

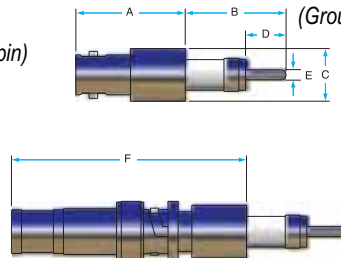


Figure 3
(Floating, 1 pin)

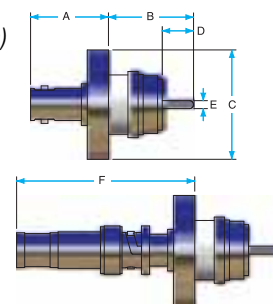


Figure	# of Pins	Conductor			Voltage (DC)	Amps/ Pin	Dimensions (in.)						Part No.	Price
		Material	Shield	Conductor			A	B	C	D	E	F		
1	1	Nickel	Grounded	Recessed	5kV	5	1.60	0.37	0.495	0.094	2.73	N/A	IFTSG011031	Call
2	1	Nickel	Grounded	Exposed	5kV	5	1.03	0.95	0.495	0.38	0.094	2.16	IFTSE011031	Call
3	1	Nickel	Floating	Recessed	2500kV	5	0.92	1.05	1.285	0.37	0.094	2.05	IFTSF011031	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, bare wire, and wire beads.

CF Flange, Single-Ended

Figure 1
(Grounded, 2 pin)

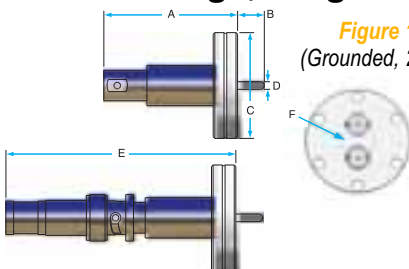


Figure 2
(Grounded, 2 pin)

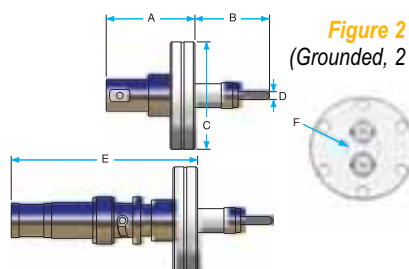
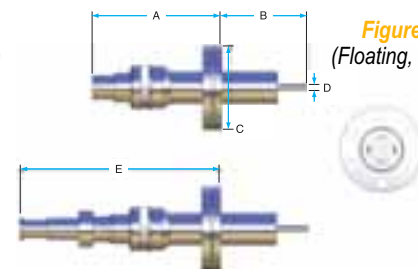


Figure 3
(Floating, 1 pin)



	# of	Conductor			Flange	Voltage	Amps/	Dimensions (in.)							Part No.	Price
Figure	Pins	Material	Shield	Conductor	Size	(DC)	Pin	A	B	C	D	E	F			
1	1	Nickel	Grounded	Recessed	1.33" CF	5kV	5	1.60	0.37	1.33	0.094	2.73	N/A	IFTSG011032	Call	
1	1	Nickel	Grounded	Recessed	2.75" CF	5kV	5	1.60	0.37	2.75	0.094	2.73	N/A	IFTSG011033	Call	
1	2	Nickel	Grounded	Recessed	2.75" CF	5kV	5	1.60	0.37	2.75	0.094	2.73	0.87	IFTSG021033	Call	
1	3	Nickel	Grounded	Recessed	2.75" CF	5kV	5	1.60	0.37	2.75	0.094	2.73	0.87	IFTSG031033	Call	
1	4	Nickel	Grounded	Recessed	2.75" CF	5kV	5	1.60	0.37	2.75	0.094	2.73	0.95	IFTSG041033	Call	
2	1	Nickel	Grounded	Exposed	1.33" CF	5kV	5	1.03	0.95	1.33	0.094	2.16	N/A	IFTSE011032	Call	
2	1	Nickel	Grounded	Exposed	2.75" CF	5kV	5	1.03	0.95	2.75	0.094	2.16	N/A	IFTSE011033	Call	
2	2	Nickel	Grounded	Exposed	2.75" CF	5kV	5	1.03	0.95	2.75	0.094	2.16	0.87	IFTSE021033	Call	
2	3	Nickel	Grounded	Exposed	2.75" CF	5kV	5	1.03	0.95	2.75	0.094	2.16	0.87	IFTSE031033	Call	
2	4	Nickel	Grounded	Exposed	2.75" CF	5kV	5	1.03	0.95	2.75	0.094	2.16	0.95	IFTSE041033	Call	
3	1	Nickel	Floating	Recessed	1.33" CF	2500kV	5	2.04	1.38	1.33	0.094	3.17	N/A	IFTSF011032	Call	
3	1	Nickel	Floating	Recessed	2.75" CF	2500kV	5	2.25	1.17	2.75	0.094	3.38	N/A	IFTSF011033	Call	

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, bare wire, and wire beads.

➤ SHV-5

SPECIFICATIONS

for Single-Ended KF Flange, 1" Baseplate, and NPT

Maximum Voltage:

Grounded Shield: 5,000 VDC

Floating Shield: Shield-Ground: 2,500 VDC

Floating Shield: Shield-Pin: 5,000 VDC

Maximum Current: 5A

Conductor: Nickel

Insulator: Alumina

Cable: RG-59U

Connector: Bayonet

Vacuum Application: HV or UHV

Temperature:

Weld Adapter, CF: -200° C to +450° C

KF, O-Ring, NPT: to +150° C

Max. Ramp Rate: 25° C/minute

Cable Connectors: -65° C to +165° C

■ KF (QF) Flange, Single-Ended

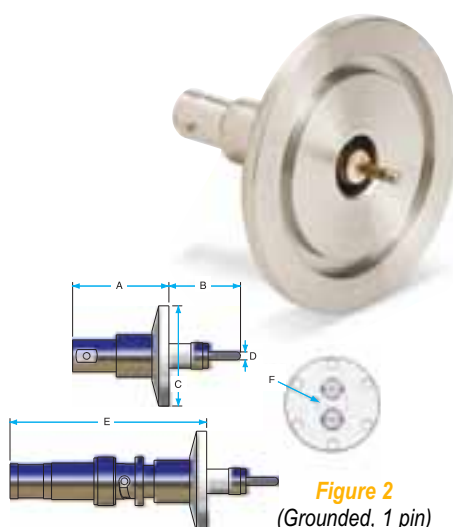
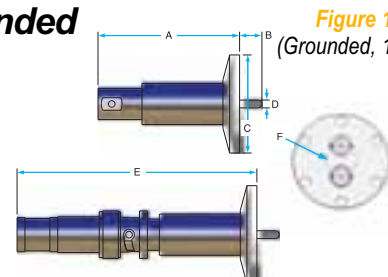
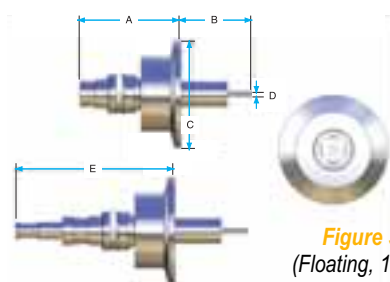
Figure 2
(Grounded, 1 pin)Figure 1
(Grounded, 1 pin)Figure 3
(Floating, 1 pin)

Figure	# of Pins	Conductor Material	Shield	Conductor	Flange Size	Voltage (DC)	Amps/ Pin	Dimensions (in.)						Part No.	Price
1	1	Nickel	Grounded	Recessed	KF16	5kV	5	1.60	0.37	1.18	0.094	2.73	N/A	IFTSG011038	Call
1	1	Nickel	Grounded	Recessed	KF40	5kV	5	1.60	0.37	2.16	0.094	2.73	N/A	IFTSG011038B	Call
1	3	Nickel	Grounded	Recessed	KF50	5kV	5	1.60	0.37	2.95	0.094	2.73	0.87	IFTSG031038C	Call
1	4	Nickel	Grounded	Recessed	KF50	5kV	5	1.60	0.37	2.95	0.094	2.73	0.95	IFTSG041038C	Call
2	1	Nickel	Grounded	Exposed	KF16	5kV	5	1.03	0.95	1.18	0.094	2.16	N/A	IFTSE011038	Call
2	1	Nickel	Grounded	Exposed	KF40	5kV	5	1.03	0.95	2.16	0.094	2.16	N/A	IFTSE011038B	Call
2	2	Nickel	Grounded	Exposed	KF40	5kV	5	1.03	0.95	2.16	0.094	2.16	0.87	IFTSE021038B	Call
2	3	Nickel	Grounded	Exposed	KF50	5kV	5	1.03	0.95	2.95	0.094	2.16	0.87	IFTSE031038C	Call
2	4	Nickel	Grounded	Exposed	KF40	5kV	5	1.03	0.95	2.16	0.094	2.16	0.95	IFTSE041038B	Call
2	4	Nickel	Grounded	Exposed	KF50	5kV	5	1.03	0.95	2.95	0.094	2.16	0.95	IFTSE041038C	Call
3	1	Nickel	Floating	Recessed	KF16	2500kV	5	2.01	1.45	1.18	0.094	3.14	N/A	IFTSF011038	Call
3	1	Nickel	Floating	Recessed	KF40	2500kV	5	2.01	1.45	2.16	0.094	3.14	N/A	IFTSF011038B	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, bare wire, and wire beads.

■ 1" Baseplate, Single-Ended

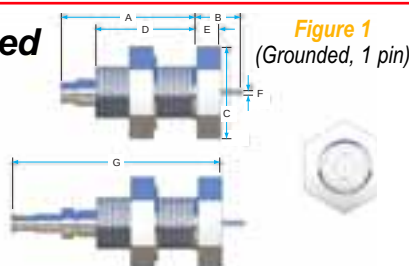
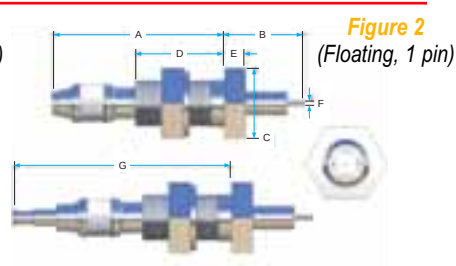
Figure 1
(Grounded, 1 pin)Figure 2
(Floating, 1 pin)

Figure	# of Pins	Conductor			Voltage (DC)	Amps/		Dimensions (in.)								Part No.	Price
		Material	Shield	Mounting		Pin	Impedance	A	B	C	D	E	F	G			
1	1	Nickel	Grounded	1" BP	5kV	5A	Non Constant	2.62	0.85	1.50	1.88	0.44	0.094	3.75	IFTSG011034	Call	
2	1	Nickel	Floating	1" BP	2500kV	5A	Non Constant	3.64	1.22	1.50	1.88	0.44	0.094	4.77	IFTSF011034	Call	

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, bare wire, and wire beads.

■ NPT, Single-Ended

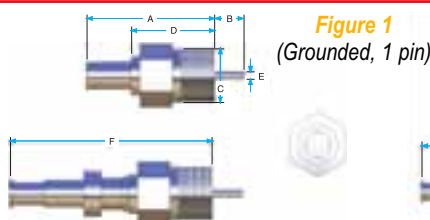
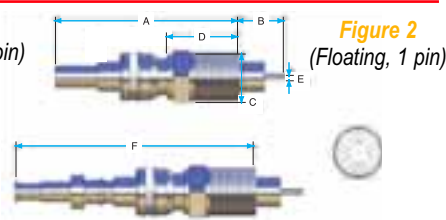
Figure 1
(Grounded, 1 pin)Figure 2
(Floating, 1 pin)

Figure	# of Pins	Conductor Material	Shield	Mounting	Voltage (DC)	Amps/ Pin	Impedance	Dimensions (in.)						Part No.	Price
1	1	Nickel	Grounded	3/8" NPT	5kV	5	Non Constant	1.60	0.37	0.675	0.89	0.094	2.73	IFTSG011035	Call
2	1	Nickel	Floating	1/2" NPT	2500kV	5	Non Constant	2.97	0.78	0.84	1.20	0.094	4.00	IFTSF011035	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, bare wire, and wire beads.

IN THIS SECTION ➤

SHV-10

SHV-10 feedthroughs:

- Designed and rated for use in high vacuum and UHV applications
- Constructed of vacuum-grade materials, including 304 stainless steel conductor pins and mounts, high-purity alumina ceramic insulation, and vacuum-tube-grade braze alloys
- Recessed female contacts in cable connectors reduce the possibility of electrical shock while preventing crossmating with BNC- or MHV-style components
- These coaxial assemblies have one air-side cable connector, but no vacuum-side power push-on connectors

SPECIFICATIONS

for Single-Ended Weldable and CF Flange

Maximum Voltage:

Grounded Shield: 10,000 VDC

Maximum Current: 5A

Conductor: Nickel

Insulator: Alumina

Cable: RG-58, 58A, 58C/U

Connection: Bayonet

Vacuum Application: HV or UHV

Temperature:

Weld Adapter, CF: -200° C to +450° C

Max Ramp Rate: 25° C/minute

Cable Connectors: -65° C to +165° C

Weldable, Single-Ended

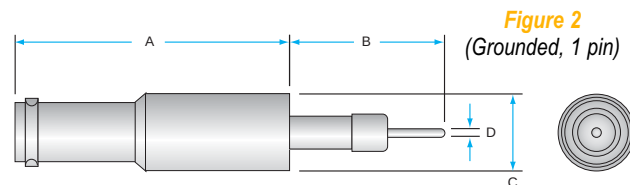
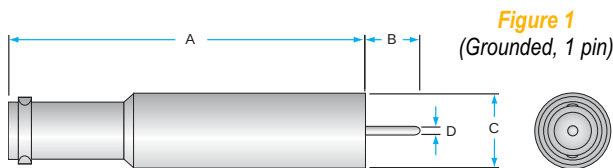


Figure	# of Pins	Amps/ Pin	Voltage (DC)	Shield	Conductor Material	Conductor	Dimensions (in.)				Part No.	Price
							A	B	C	D		
1	1	5	10kV	Grounded	Nickel	Recessed	2.40	0.38	0.50	0.050	IFTVG011051	Call
2	1	5	10kV	Grounded	Nickel	Exposed	1.77	1.00	0.50	0.050	IFTVE011051	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, bare wire, and wire beads.

CF Flange, Single-Ended

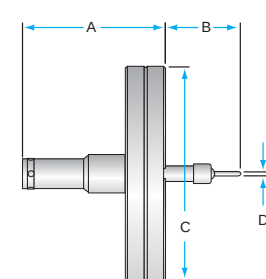
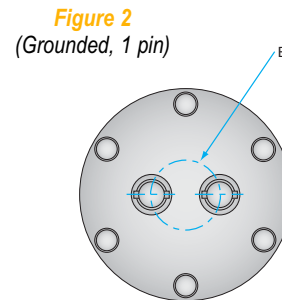
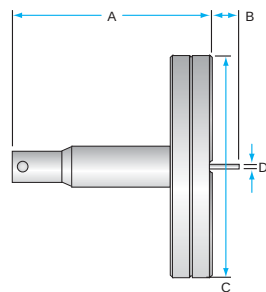
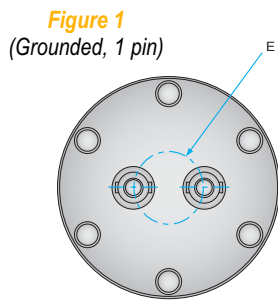


Figure	Flange Size	# of Pins	Amps/ Pin	Voltage (DC)	Shield	Conductor Material	Conductor	Dimensions (in.)					Part No.	Price
								A	B	C	D	E		
1	1.33" CF	1	5	10kV	Grounded	Nickel	Recessed	2.40	0.38	1.33	0.50	N/A	IFTVG011052	Call
1	2.75" CF	1	5	10kV	Grounded	Nickel	Recessed	2.40	0.38	2.75	0.50	N/A	IFTVG011053	Call
1	2.75" CF	2	5	10kV	Grounded	Nickel	Recessed	2.40	0.38	2.75	0.50	0.87	IFTVG021053	Call
1	2.75" CF	3	5	10kV	Grounded	Nickel	Recessed	2.40	0.38	2.75	0.50	0.87	IFTVG031053	Call
1	2.75" CF	4	5	10kV	Grounded	Nickel	Recessed	2.40	0.38	2.75	0.50	0.95	IFTVG041053	Call
2	1.33" CF	1	5	10kV	Grounded	Nickel	Exposed	1.77	1.00	1.33	0.50	N/A	IFTVE011052	Call
2	2.75" CF	1	5	10kV	Grounded	Nickel	Exposed	1.77	1.00	2.75	0.50	N/A	IFTVE011053	Call
2	2.75" CF	2	5	10kV	Grounded	Nickel	Exposed	1.77	1.00	2.75	0.50	0.87	IFTVE021053	Call
2	2.75" CF	3	5	10kV	Grounded	Nickel	Exposed	1.77	1.00	2.75	0.50	0.87	IFTVE031053	Call
2	2.75" CF	4	5	10kV	Grounded	Nickel	Exposed	1.77	1.00	2.75	0.50	0.95	IFTVE041053	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, bare wire, and wire beads.

➤ **SHV-10****SPECIFICATIONS**

for Single-Ended KF Flange, Baseplate, and NPT

Maximum Voltage:

Grounded Shield: 10,000 VDC

Maximum Current: 5A**Conductor:** Nickel**Insulator:** Alumina**Cable:** RG-58, 58A, 58C/U**Connector:** Bayonet**Vacuum Application:** HV or UHV**Temperature:**

Weld Adapter, CF: -200° C to +450° C

KF, O-Ring, NPT: to +150° C

Max. Ramp Rate: 25° C/minute

Cable Connectors: -65° C to +165° C

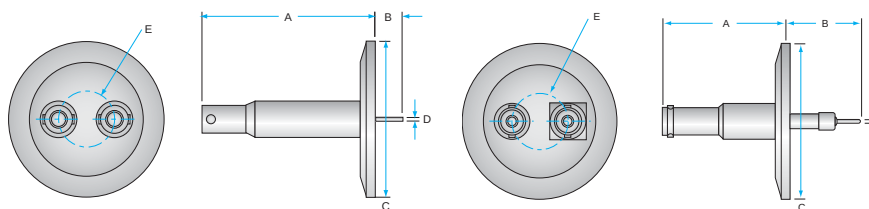
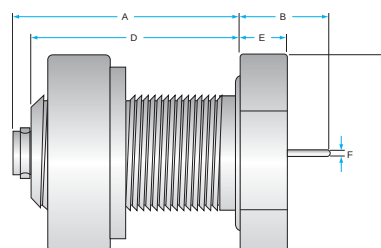
■ **KF (QF) Flange, Single-Ended****Figure 1**
(Grounded, 1 pin)**Figure 2**
(Grounded, 1 pin)

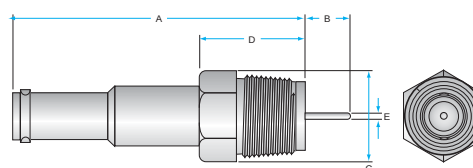
Figure	Flange Size	# of Pins	Amps/ Pin	Voltage (DC)	Shield	Conductor Material	Conductor	Dimensions (in.)					Part No.	Price
								A	B	C	D	E		
1	KF16	1	5	10kV	Grounded	Nickel	Recessed	2.40	0.38	1.18	0.50	N/A	IFTVG011058	Call
1	KF40	1	5	10kV	Grounded	Nickel	Recessed	2.40	0.38	2.16	0.50	N/A	IFTVG011058B	Call
1	KF40	2	5	10kV	Grounded	Nickel	Recessed	2.40	0.38	2.16	0.50	0.78	IFTVG021058B	Call
1	KF50	3	5	10kV	Grounded	Nickel	Recessed	2.40	0.38	2.95	0.50	0.87	IFTVG031058C	Call
1	KF50	4	5	10kV	Grounded	Nickel	Recessed	2.40	0.38	2.95	0.50	0.95	IFTVG041058C	Call
2	KF16	1	5	10kV	Grounded	Nickel	Exposed	1.77	1.00	1.18	0.50	N/A	IFTVE011058	Call
2	KF40	1	5	10kV	Grounded	Nickel	Exposed	1.77	1.00	2.16	0.50	N/A	IFTVE011058B	Call
2	KF40	2	5	10kV	Grounded	Nickel	Exposed	1.77	1.00	2.16	0.50	0.78	IFTVE021058B	Call
2	KF50	3	5	10kV	Grounded	Nickel	Exposed	1.77	1.00	2.95	0.50	0.87	IFTVE031058C	Call
2	KF50	4	5	10kV	Grounded	Nickel	Exposed	1.77	1.00	2.95	0.50	0.95	IFTVE041058C	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, bare wire, and wire beads.

■ **Baseplate, Single-Ended**

# of Pins	Amps/ Pin	Voltage (DC)	Mounting	Shield	Conductor Material	Dimensions (in.)						Part No.	Price
						A	B	C	D	E	F		
1	5	10kV	1" BP	Grounded	Nickel	1.96	0.81	1.50	1.88	0.44	0.50	IFTVG011054	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, bare wire, and wire beads.

■ **NPT, Single-Ended**

# of Pins	Amps/ Pin	Voltage (DC)	Mounting	Shield	Conductor Material	Dimensions (in.)					Part No.	Price
						A	B	C	D	E		
1	5	10kV	3/8" NPT	Grounded	Nickel	2.40	0.38	0.68	0.865	0.50	IFTVG011055	Call

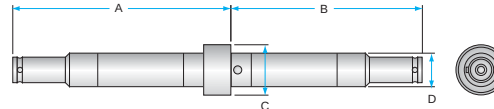
Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, bare wire, and wire beads.

SPECIFICATIONS

for Double-Ended Weldable, CF Flange and KF Flange

Maximum Voltage:	Vacuum Application: HV or UHV
Grounded Shield: 10,000 VDC	Temperature:
Maximum Current: 5A	Weld Adapter, CF: -200° C to +450° C
Conductor: Nickel	KF, O-Ring, NPT: to +150° C
Insulator: Alumina	Max Ramp Rate: 25° C/minute
Cable: RG-58, 58A, 58C/U	Cable Connectors: -65° C to +165° C
Connection: Bayonet	

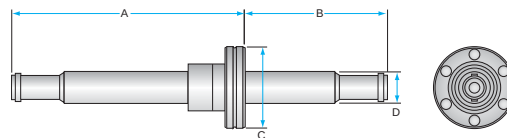
■ **Weldable, Double-Ended**



# of Pins	Amps/ Pin	Voltage (DC)	Shield	Conductor Material	Dimensions (in.)				Part No.	Price
					A	B	C	D		
1	5	10kV	Grounded	Nickel	3.23	2.83	0.745	0.495	IFDVG011051	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, bare wire, and wire beads.

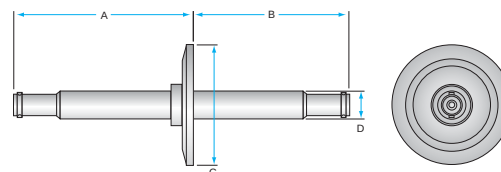
■ **CF Flange, Double-Ended**



Flange Size	# of Pins	Amps/ Pin	Voltage (DC)	Shield	Conductor Material	Dimensions (in.)				Part No.	Price
						A	B	C	D		
1.33" CF	1	5	10kV	Grounded	Nickel	3.73	2.33	1.33	0.495	IFDVG011052	Call
2.75" CF	1	5	10kV	Grounded	Nickel	3.23	2.83	2.75	0.495	IFDVG011053	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, bare wire, and wire beads.

■ **KF (QF) Flange, Double-Ended**



Flange Size	# of Pins	Amps/ Pin	Voltage (DC)	Shield	Conductor Material	Dimensions (in.)				Part No.	Price
						A	B	C	D		
KF16	1	5	10kV	Grounded	Nickel	3.23	2.83	1.18	0.495	IFDVG011058	Call
KF40	1	5	10kV	Grounded	Nickel	3.23	2.83	2.16	0.495	IFDVG011058B	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, bare wire, and wire beads.

SHV-20

IN THIS SECTION

SHV-20

Safe, High Voltage to 20kV (SHV-20) coaxial feedthroughs:

- Feature grounded shields
- Have recessed or exposed ceramic insulators
- Offer the highest voltage and current ratings of the SHV line
- Recessed female contacts in cable connectors reduce the possibility of electrical shock
- Assemblies have air-side cable connectors (vacuum-side push-on connectors are available as accessories)

SPECIFICATIONS

for Single-Ended Weldable and CF Flange

Maximum Voltage:	Vacuum Application: HV or UHV
Grounded Shield: 20,000 VDC	Temperature:
Maximum Current: 15A	Weld Adapter, CF: -200° C to +450° C
Conductor: Nickel	Max Ramp Rate: 25° C/minute
Insulator: Alumina	Cable Connectors: -40° C to +100° C
Cable: RG-8U	
Connection: Bayonet	

Weldable, Single-Ended

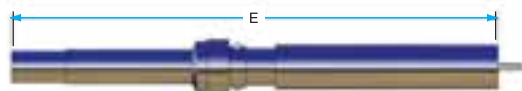
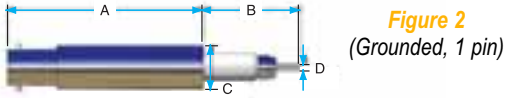
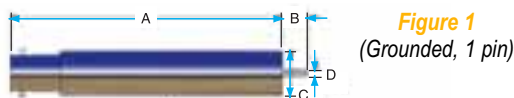


Figure	# of Pins	Conductor Material	Shield	Conductor	Voltage (DC)	Amps/Pin	Dimensions (in.)					Part No.	Price
1	1	Nickel	Grounded	Recessed	20kV	15	3.76	0.36	0.62	0.092	6.19	IFTXG011151	Call
2	1	Nickel	Grounded	Exposed	20kV	15	2.75	1.37	0.62	0.092	5.18	IFTXE011151	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, bare wire, and wire beads.

CF Flange, Single-Ended

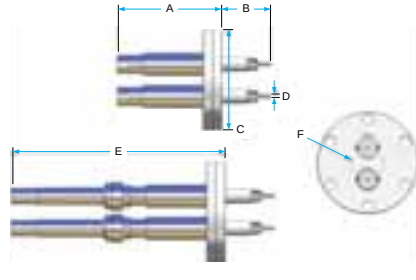
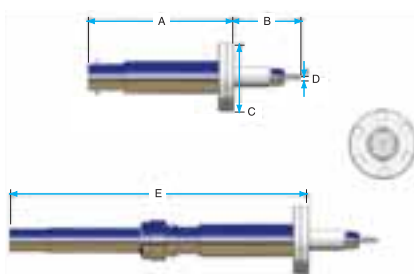
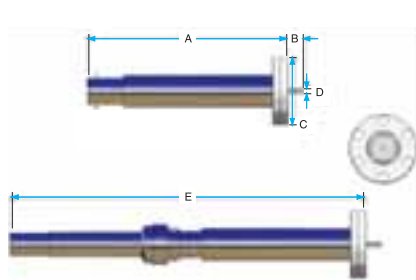


Figure 1 (Grounded, 1 pin)

Figure 2 (Grounded, 1 pin)

Figure 3 (Grounded, 2 pin)

Figure	# of Pins	Conductor Material	Shield	Flange Size	Conductor	Voltage (DC)	Amps/Pin	Dimensions (in.)						Part No.	Price
1	1	Nickel	Grounded	1.33" CF	Recessed	20kV	15	3.76	0.36	1.33	0.092	6.19	N/A	IFTXG011152	Call
2	1	Nickel	Grounded	1.33" CF	Exposed	20kV	15	2.75	1.37	1.33	0.092	5.18	N/A	IFTXE011152	Call
3	2	Nickel	Grounded	2.75" CF	Exposed	20kV	15	2.75	1.37	2.75	0.092	5.18	0.87	IFTXE021153	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, bare wire, and wire beads.

➤ **Type N**

IN THIS SECTION ➤

Type N

Type N coaxial feedthroughs:

- Use Nickel as conductor material
- Feature grounded shields
- Feedthroughs have air-side cable connectors (vacuum-side push-on connectors are available as accessories for single-ended versions only)

SPECIFICATIONS

for Single-Ended Weldable
and CF Flange

Maximum Voltage:

Grounded Shield: 500 VDC

Maximum Current: 3A

Conductor: Nickel

Insulator: Alumina

Cable: RG-8U, RG-9U, RG-10U

Connection: Screw Thread

Vacuum Application: HV or UHV

Temperature:

Weld Adapter, CF: -200° C to +450° C

KF, O-Ring, NPT: to +150° C

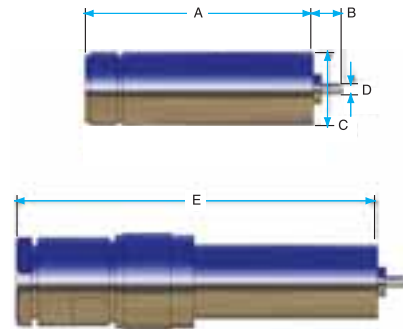
Max. Ramp Rate: 25° C/minute

Cable Connectors: -65° C to +165° C

3

Feedthroughs

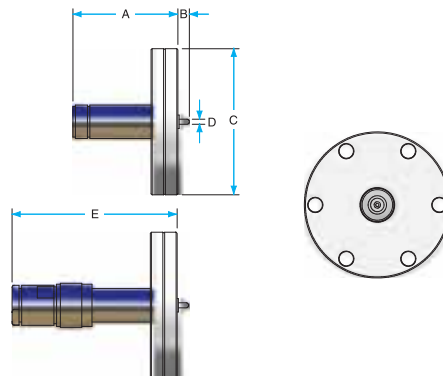
■ **Weldable, Single-Ended**



# of Pins	Conductor Material	Shield	Voltage (DC)	Amps/Pin	Dimensions (in.)					Part No.	Price
					A	B	C	D	E		
1	Nickel	Grounded	500V	3	1.91	0.26	0.622	0.094	3.00	IFTNG011031	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, bare wire, and wire beads.

■ **CF Flange, Single-Ended**



# of Pins	Conductor Material	Shield	Flange Size	Voltage	Amps/ Pin	Dimensions (in.)					Part No.	Price
						A	B	C	D	E		
1	Nickel	Grounded	1.33" CF	500V	3	1.91	0.26	1.33	0.094	3.00	IFTNG011032	Call
1	Nickel	Grounded	2.75" CF	500V	3	1.91	0.26	2.75	0.094	3.00	IFTNG011033	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, bare wire, and wire beads.

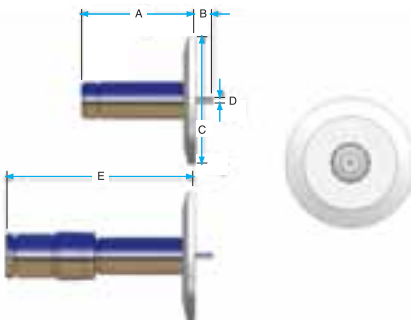
Type N

SPECIFICATIONS

for Single-Ended KF Flange, Baseplate, and NPT

- Maximum Voltage:
 - Grounded Shield: 500 VDC
- Maximum Current: 3A
- Conductor: Nickel
- Insulator: Alumina
- Cable: RG-8U, RG-9U, RG-10U
- Connection: Screw Thread
- Vacuum Application: HV or UHV
- Temperature:
 - Weld Adapter, CF: -200° C to +450° C
 - KF, O-Ring, NPT: to +150° C
 - Max. Ramp Rate: 25° C/minute
 - Cable Connectors: -65° C to +165° C

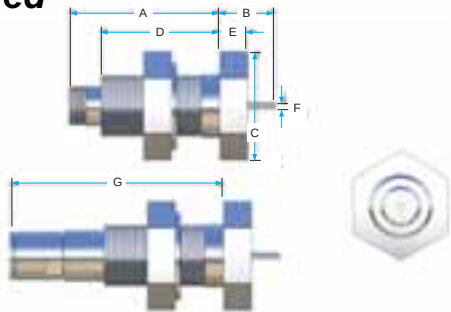
KF (QF) Flange, Single-Ended



# of Pins	Conductor Material	Shield	Flange Size	Voltage	Amps/ Pin	Dimensions (in.)					Part No.	Price
						A	B	C	D	E		
1	Nickel	Grounded	KF16	500V	3	1.91	0.26	1.18	0.094	3.00	IFTNG011038	Call
1	Nickel	Grounded	KF40	500V	3	1.91	0.26	2.16	0.094	3.00	IFTNG011038B	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, bare wire, and wire beads.

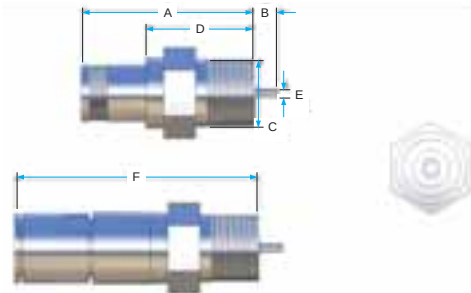
1" Baseplate, Single-Ended



# of Pins	Material	Shield	Mounting	Voltage	Amps/ Pin	Dimensions (in.)							Part No.	Price
						A	B	C	D	E	F	G		
1	Nickel	Grounded	1" BP	500V	3	2.38	0.70	1.50	1.88	0.44	0.094	3.48	IFTNG011034	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, bare wire, and wire beads.

NPT, Single-Ended



# of Pins	Material	Shield	Mounting	Voltage	Amps/ Pin	Dimensions (in.)						Part No.	Price
						A	B	C	D	E	F		
1	Nickel	Grounded	3/4" NPT	500V	3	1.91	0.26	1.05	1.20	0.094	3.00	IFTNG011035	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, bare wire, and wire beads.

➤ **Type N**

SPECIFICATIONS

for Double-Ended Weldable,
CF Flanges & KF Flange

Maximum Voltage:

Grounded Shield: 500 VDC

Maximum Current: 3A

Conductor: Nickel

Insulator: Alumina

Cable: RG-8U, RG-9U, RG-10U

Connection: Screw Thread

Vacuum Application: HV or UHV

Temperature:

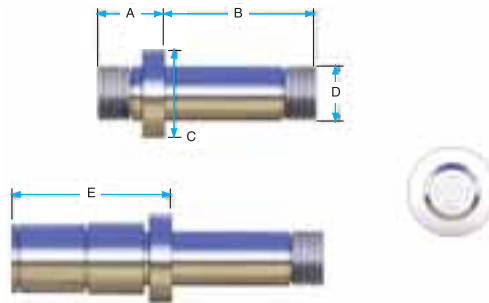
Weld Adapter, CF: -200° C to +450° C

KF, O-Ring, NPT: to +150° C

Max. Ramp Rate: 25° C/minute

Cable Connectors: -65° C to +165° C

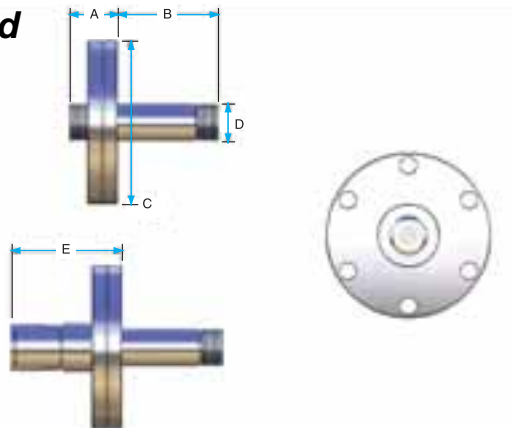
■ **Weldable, Double-Ended**



# of Pins	Conductor Material	Shield	Voltage (DC)	Amps/Pin	Dimensions (in.)					Part No.	Price
					A	B	C	D	E		
1	Nickel	Grounded	500V	3	0.75	1.71	0.995	0.63	1.85	IFDNG011031	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors.

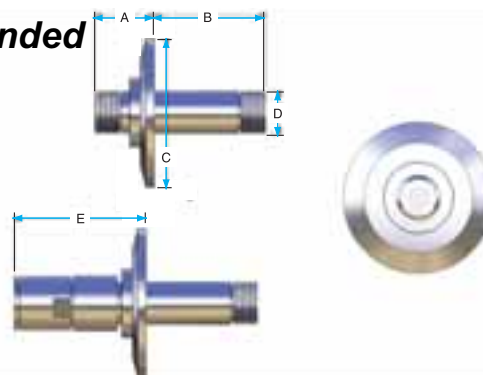
■ **CF Flange, Double-Ended**



# of Pins	Conductor Material	Shield	Flange Size	Voltage (DC)	Amps/Pin	Dimensions (in.)					Part No.	Price
						A	B	C	D	E		
1	Nickel	Grounded	2.75" CF	500V	3	0.75	1.71	2.75	0.63	1.85	IFDNG011033	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors.

■ **KF (QF) Flange, Double-Ended**



# of Pins	Conductor Material	Shield	Flange Size	Voltage (DC)	Amps/Pin	Dimensions (in.)					Part No.	Price
						A	B	C	D	E		
1	Nickel	Grounded	KF40	500V	3	0.75	1.71	2.16	0.63	1.85	IFDNG011038B	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors.

➤ Type N

SPECIFICATIONS
for Double-Ended
1" Baseplate & NPT

- Maximum Voltage:
 - Grounded Shield: 500 VDC
- Maximum Current: 3A
- Conductor: Nickel
- Insulator: Alumina
- Cable: RG-8U, RG-9U, RG-10U
- Connection: Screw Thread
- Vacuum Application: HV or UHV
- Temperature:
 - Weld Adapter, CF: -200° C to +450° C
 - KF, O-Ring, NPT: to +150° C
 - Max. Ramp Rate: 25° C/minute
 - Cable Connectors: -65° C to +165° C

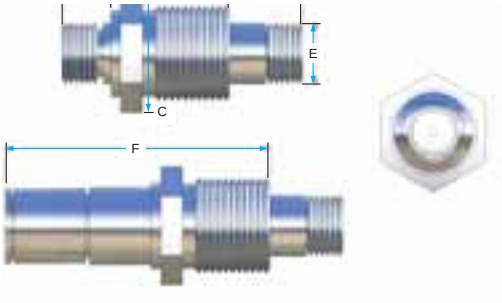
■ 1" Baseplate, Double-Ended



# of Pins	Conductor	Shield	Mounting	Voltage (DC)	Amps/Pin	Dimensions (in.)								Part No.	Price
	Material					A	B	C	D	E	F	G			
1	Nickel	Grounded	1" BP	500V	3	2.38	0.94	1.50	1.88	0.44	0.63	3.48	IFDNG011034	Call	

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors.

■ NPT, Double-Ended



# of Pins	Conductor		Mounting	Voltage (DC)	Amps/Pin	Dimensions (in.)						Part No.	Price
	Material	Shield				A	B	C	D	E	F		
1	Nickel	Grounded	3/4" NPT	500V	3	1.71	0.75	1.06	1.21	0.63	2.81	IFDNG011035	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors.

IN THIS SECTION ➤
SMA

Subminiature-A (SMA) single-ended coaxial feedthroughs:

- Made of 304 stainless steel
- Feature floating or grounded shields
- Versions available with 50-ohm matched impedance
- Feedthroughs have air-side cable connectors (vacuum-side, push-on connectors are available as accessories)

SPECIFICATIONS

for Single-Ended Weldable, CF Flange, & KF Flange

Maximum Voltage:

Grounded Shield: 700 VDC

Floating Shield: Shield-Ground: 2,500 VDC

Floating Shield: Shield-Pin: 700 VDC

Maximum Current: 1A

Impedance: 48–52 ohms

Conductor: Stainless Steel

Insulator: Alumina

Cable: RG-8U, RG-9U, RG-10U

Connection: Screw Thread

Vacuum Application: HV or UHV

Temperature:

Weld Adapter, CF: -200° C to +450° C

KF, O-Ring, NPT: To +150° C

Max. Ramp Rate: 25° C/minute

Cable Connectors: -65° C to +165° C

Figure 1
(Grounded, 1 pin)

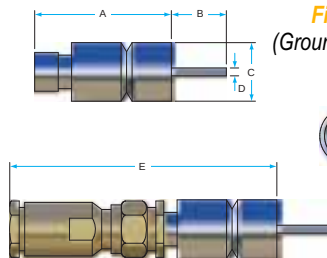
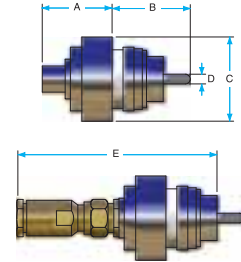


Figure 2
(Floating, 1 pin)

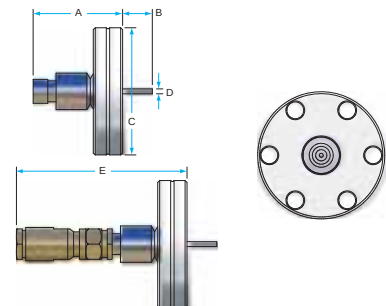


Weldable, Single-Ended

Figure	# of Pins	Conductor Material	Shield	Voltage (DC)	Amps/Pin	Dimensions (in.)					Part No.	Price
1	1	Stainless Steel	Grounded	700V	1	1.00	0.35	0.372	0.05	1.95	IFTCG012011	Call
2	1	Stainless Steel	Floating	2500V	1	0.67	0.75	0.807	0.094	1.62	IFTCF012011	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, crimp/solder connectors, 1/8" & 1/4" cables, bare wire, and wire beads.

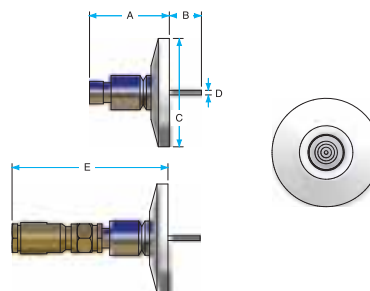
CF Flange, Single-Ended



# of Pins	Conductor Material	Shield	Voltage (DC)	Amps/Pin	Flange Size	Dimensions (in.)					Part No.	Price
1	Stainless Steel	Grounded	700V	1	1.33" CF	1.00	0.35	1.33	0.05	1.95	IFTCG012012	Call
1	Stainless Steel	Grounded	700V	1	2.75" CF	1.00	0.35	2.75	0.05	1.95	IFTCG012013	Call
1	Stainless Steel	Floating	2500V	1	2.75" CF	0.72	0.70	2.75	0.094	1.45	IFTCF012013	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, crimp/solder connectors, 1/8" & 1/4" cables, bare wire, and wire beads.

KF (QF) Flange, Single-Ended



# of Pins	Conductor Material	Shield	Voltage (DC)	Amps/Pin	Flange Size	Dimensions (in.)					Part No.	Price
1	Stainless Steel	Grounded	700V	1	KF16	1.00	0.35	1.18	.05	1.95	IFTCG012018	Call
1	Stainless Steel	Grounded	700V	1	KF40	1.00	0.35	2.16	.05	1.95	IFTCG012018B	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, crimp/solder connectors, 1/8" & 1/4" cables, bare wire, and wire beads.

➤ SMA

IN THIS SECTION ➤
SMA Feedthroughs

Subminiature-A (SMA) weldable,
double-ended coaxial feedthroughs:

- Made of 304 stainless steel
- Feature floating or grounded shields
- Versions available with 50-ohm matched impedance
- Feedthroughs have air-side cable connectors

SPECIFICATIONS

for Double-Ended Weldable,
CF Flange, & KF Flange

Maximum Voltage:

Grounded Shield: 700 VDC

Maximum Current: 1A

Conductor: Stainless Steel

Impedance: 50 ohms

Insulator: Alumina

Cable: RG-58U

Connection: Screw Thread

Vacuum Application: HV or UHV

Temperature:

Weld Adapter, CF: -270° C to +450° C

KF, O-Ring, NPT: To +150° C

Max. Ramp Rate: 25° C/minute

Cable Connectors: -65° C to +165° C

■ **Weldable, Double-Ended**

# of Pins	Conductor Material	Shield	Voltage (DC)	Amps/Pin	Impedance	Dimensions (in.)					Part No.	Price
						A	B	C	D	E		
1	Stainless Steel	Grounded	700V	1	50-Ohm Matched	0.63	0.92	0.495	0.42	1.38	IFDCG012011	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors.

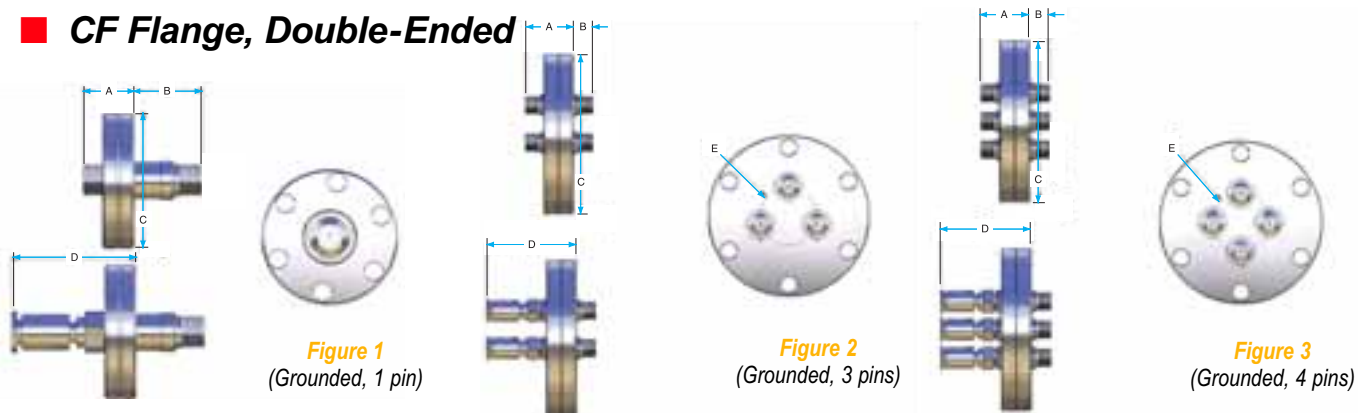
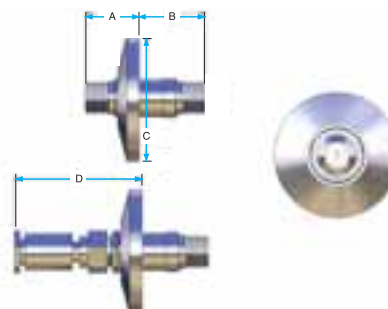
■ **CF Flange, Double-Ended**

Figure	# of Pins	Conductor Material	Shield	Voltage (DC)	Flange Size	Amps/Pin	Impedance	Dimensions (in.)					Part No.	Price
								A	B	C	D	E		
1	1	Stainless Steel	Grounded	700V	1.33" CF	1	50-Ohm Matched	0.63	0.92	1.33	1.38	N/A	IFDCG012012	Call
1	1	Stainless Steel	Grounded	700V	2.75" CF	1	50-Ohm Matched	0.63	0.92	2.75	1.38	N/A	IFDCG012013	Call
2	3	Stainless Steel	Grounded	700V	2.75" CF	1	50-Ohm Matched	0.63	0.92	2.75	1.38	0.87	IFDCG032013	Call
3	4	Stainless Steel	Grounded	700V	2.75" CF	1	50-Ohm Matched	0.63	0.92	2.75	1.38	0.87	IFDCG042013	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors.

■ **KF (QF) Flange, Double-Ended**

# of Pins	Conductor Material	Shield	Voltage (DC)	Flange Size	Amps/Pin	Impedance	Dimensions (in.)				Part No.	Price
							A	B	C	D		
1	Stainless Steel	Grounded	700V	KF16	1	50-Ohm Matched	0.63	0.92	1.18	1.38	IFDCG012018	Call
1	Stainless Steel	Grounded	700V	KF25	1	50-Ohm Matched	0.63	0.92	1.57	1.38	IFDCG012018A	Call
1	Stainless Steel	Grounded	700V	KF40	1	50-Ohm Matched	0.63	0.92	2.16	1.38	IFDCG012018B	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors.

IN THIS SECTION ➤
SMB Feedthroughs

Subminiature-B (SMB) coaxial feedthroughs:

- Conductors made of 416 stainless steel
- Feature floating or grounded shields
- Feedthroughs have air-side cable connectors (vacuum-side, push-on connectors available as accessories)

SPECIFICATIONS

for Single-Ended Weldable,
CF Flange, & KF Flange

Maximum Voltage:

Grounded Shield: 500 VDC

Floating Shield: Shield-Ground: 1,000 VDC

Floating Shield: Shield-Pin: 500 VDC

Maximum Current: .5A

Conductor: Stainless Steel (type 416)

Insulator: Alumina

Cable: RG-174U

Connection: Push Clip

Vacuum Application: HV or UHV

Temperature:

Weld Adapter, CF: To +450° C

KF, O-Ring, NPT: To +150° C

Max. Ramp Rate: 25° C/minute

Cable Connectors: -65° C to +165° C

■ **Weldable, Single-Ended**

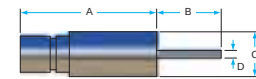


Figure 1
(Grounded, 1 pin)

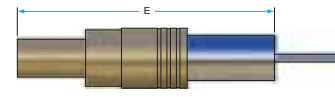


Figure 2
(Floating, 1 pin)

3

Feedthroughs

Figure	# of Pins	Conductor Material	Shield	Voltage (DC)	Amps/Pin	Dimensions (in.)					Part No.	Price
1	1	416 Stainless Steel	Grounded	500V	0.5	0.57	0.27	0.187	0.032	1.45	IFTDG012001	Call
2	1	416 Stainless Steel	Floating	1000V	0.5	0.51	0.33	0.435	0.032	1.44	IFTDF012001	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, crimp/solder connectors, 1/8" & 1/4" cables, bare wire, and wire beads.

■ **CF Flange, Single-Ended**

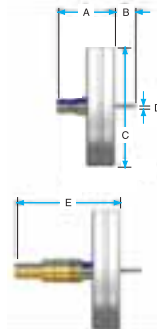


Figure 1
(Grounded, 1 pin)

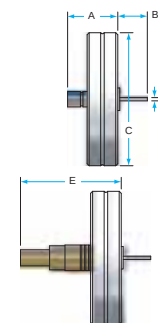


Figure 2
(Floating, 1 pin)



Figure	# of Pins	Conductor Material	Shield	Flange Size	Voltage (DC)	Amps/Pin	Dimensions (in.)					Part No.	Price
1	1	416 Stainless Steel	Grounded	1.33" CF	500V	0.5	0.57	0.27	1.33	0.032	1.45	IFTDG012002	Call
1	1	416 Stainless Steel	Grounded	2.75" CF	500V	0.5	0.57	0.27	2.75	0.032	1.45	IFTDG012003	Call
2	1	416 Stainless Steel	Floating	1.33" CF	1000V	0.5	0.51	0.33	1.33	0.032	1.44	IFTDF012002	Call
2	1	416 Stainless Steel	Floating	2.75" CF	1000V	0.5	0.51	0.33	2.75	0.032	1.44	IFTDF012003	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, crimp/solder connectors, 1/8" & 1/4" cables, bare wire, and wire beads.

■ **KF (QF) Flange, Single-Ended**

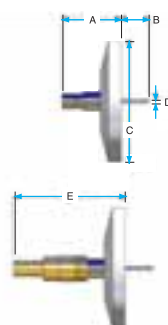


Figure 1
(Grounded, 1 pin)

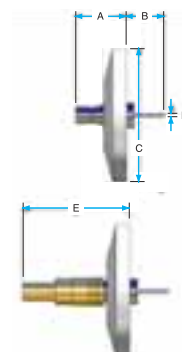


Figure 2
(Floating, 1 pin)



Figure	# of Pins	Conductor Material	Shield	Voltage	Amps/Pin	Flange Size	Dimensions (in.)					Part No.	Price
1	1	416 Stainless Steel	Grounded	500V	0.5	KF16	0.57	0.27	1.18	0.032	1.45	IFTDG012008	Call
1	1	416 Stainless Steel	Grounded	500V	0.5	KF40	0.57	0.27	2.16	0.032	1.45	IFTDG012008B	Call
2	1	416 Stainless Steel	Floating	1000V	0.5	KF40	0.51	0.33	2.16	0.032	1.44	IFTDF012008B	Call
2	1	416 Stainless Steel	Floating	1000V	0.5	KF16	0.51	0.33	1.18	0.032	1.44	IFTDF012008	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, inline barrel connectors, set screw connectors, crimp/solder connectors, 1/8" & 1/4" cables, bare wire, and wire beads.

➤ “Between Series” BNC to Microdot

IN THIS SECTION ➤
BNC to Microdot

- Bayonet navel connector (BNC) to Microdot coaxial feedthroughs:
- Allow a means of adapting coaxial connection styles
 - Typically used for deposition monitors (crystal head sensors), with the Microdot connection in-vacuum and the BNC connection to cable to the controller
 - Assembly includes a single air-side connector

SPECIFICATIONS

Double-Ended for Weldable & CF Flange

- Maximum Voltage:**
Grounded Shield: 500 VDC

Maximum Current: 1A

Conductor: Stainless Steel

Insulator: Alumina

Cable: RG-58U

Connection: Bayonet

Vacuum Application: HV or UHV
- Temperature:**
Weld Adapter, CF: -200° C to +400° C

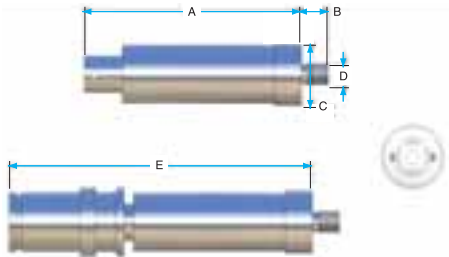
KF, O-Ring, NPT: Ambient to +150° C

Max. Ramp Rate: 25° C/ minute

Cable Connectors: -65° C to +165° C

■ Weldable, Double-Ended

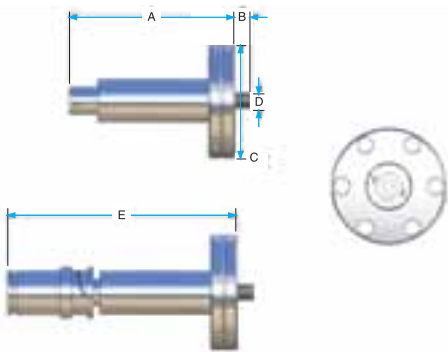
Bayonet navel connector (BNC) to Microdot coaxial feedthroughs:



# of Pins	Conductor Material	Voltage (DC)	Amps/Pin	Shield	Dimensions (in.)					Part No.	Price
					A	B	C	D	E		
1	Stainless Steel	500V	1	Grounded	1.83	0.23	0.528	0.19	2.50	IFDBM012011	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, 1/8" & 1/4" cables.

■ CF Flange, Double-Ended



# of Pins	Conductor Material	Voltage (DC)	Amps/Pin	Flange Size	Shield	Dimensions (in.)					Part No.	Price
						A	B	C	D	E		
1	Stainless Steel	500V	1	1.33" CF	Grounded	1.83	0.23	1.33	0.19	2.50	IFDBM012012	Call
1	Stainless Steel	500V	1	2.75" CF	Grounded	1.83	0.23	2.75	0.19	2.50	IFDBM012013	Call

Refer to Connectors & Cabling, starting on page 3-113, for coaxial connectors, 1/8" & 1/4" cables.

➤ MPC Multi-Pin, Circular

■ **Weldable, Single-Ended**

IN THIS SECTION ➤

MPC Feedthroughs

Multi-Pin, Circular (MPC) Feedthroughs:

- Non-magnetic connector headers
- Available in configurations with 3, 6, 10, 19, 32, and 41 pins
- Feature stainless steel shells and gold-plated stainless steel alloy pins
- UHV compatible with a minimum leak rate of 1×10^{-9} scc He/sec.
- Single-ended design consists of a plug on the air side with .040" diameter pins for connection on the vacuum side*
- Double-ended design has a plug on the air side and a threaded plug connection on the vacuum side*

*Plugs not included with feedthroughs

SPECIFICATIONS

Conductor Material: Stainless Steel, Gold Plated

Insulator Material: Glass-Ceramic

Connection: Bayonet

Vacuum Application: HV or UHV

Max. Current: 5A

Max. Voltage: 1kV

Number of Pins: 3-41

Temperature Range:

Weld Adapter, CF: -269° C to +450° C

KF, O-Ring, NPT: -25° C to +205° C

Max. Ramp Rate: 25°C/minute

Air-Side Connector: -55° C to +35° C

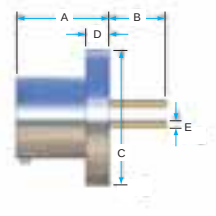


Figure 1
(3 pins)



Figure 2
(6 pins)

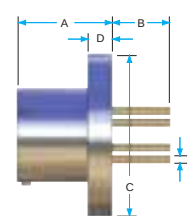


Figure 3
(10 pins)



Figure 4
(19 pins)

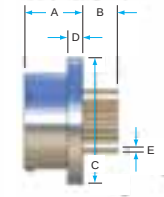


Figure 5
(32 pins)

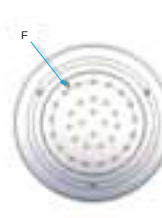
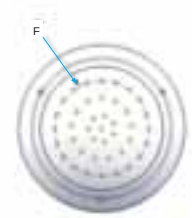
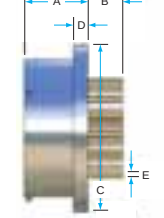


Figure 6
(41 pins)



3

Feedthroughs

Figure	# of Pins	Conductor Material	Voltage (DC)	Crimp or Solder	Amps/Pin	Dimensions (in.)						Part No.	Price
1	3	Gold-Plated SST	1kV	Crimp	5	0.51	0.31	0.745	0.13	0.04	0.15	IFTRG037011	Call
2	6	Gold-Plated SST	1kV	Crimp	5	0.51	0.31	0.87	0.13	0.04	0.26	IFTRG067011	Call
3	10	Gold-Plated SST	1kV	Crimp	5	0.51	0.31	0.995	0.13	0.04	0.39	IFTRG107011	Call
4	19	Gold-Plated SST	1kV	Crimp	5	0.51	0.31	1.12	0.13	0.04	0.52	IFTRG197011	Call
5	32	Gold-Plated SST	1kV	Crimp	5	0.51	0.31	1.37	0.13	0.04	0.72	IFTRG327011	Call
6	41	Gold-Plated SST	1kV	Crimp	5	0.57	0.31	1.50	0.13	0.04	0.84	IFTRG417011	Call

Refer to Connectors & Cabling, starting on page 3-113, for multi-pin circular connectors, set screw connectors, crimp/solder connectors, bare wire, and wire beads.

MPC Multi-Pin, Circular

CF Flanged, Single-Ended

3
Feedthroughs

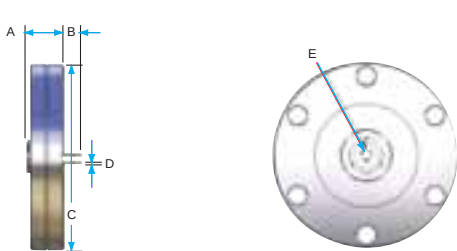


Figure 1 (3 pins)

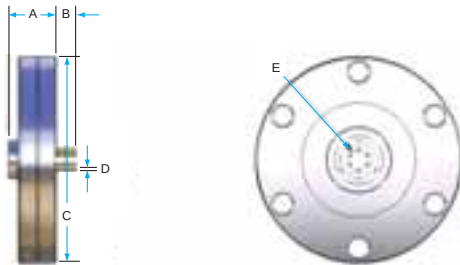


Figure 2 (6 pins)

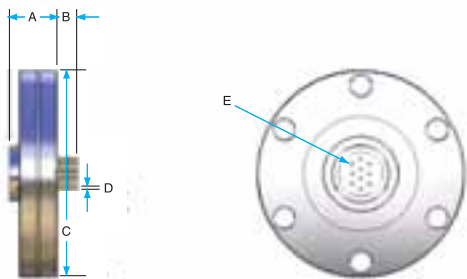


Figure 3 (10 pins)

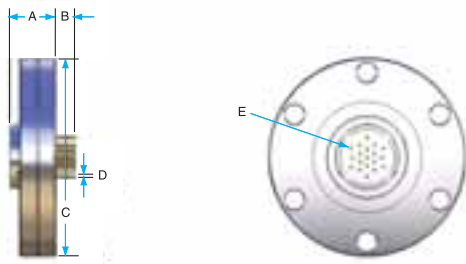


Figure 4 (19 pins)

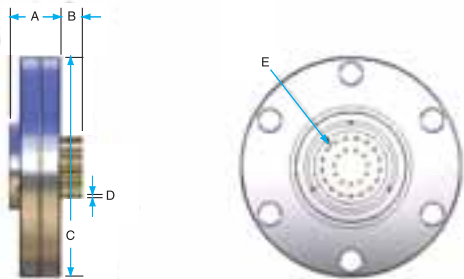


Figure 5 (32 pins)

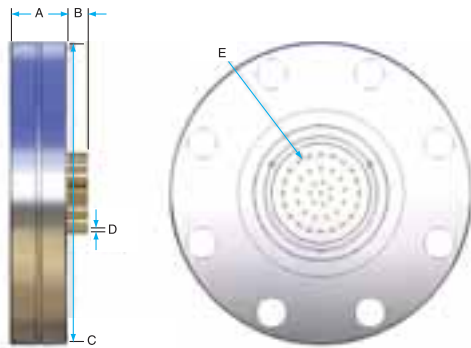


Figure 6 (41 pins)

Figure	# of Pins	Conductor Material	Voltage (DC)	Crimp or Solder	Amps/Pin	Flange Size	Dimensions (in.)					Part No.	Price
							A	B	C	D	E		
1	3	Gold-Plated SST	1kV	Crimp	5	2.75" CF	0.63	0.26	2.75	0.04	0.15	IFTRG037013	Call
2	6	Gold-Plated SST	1kV	Crimp	5	2.75" CF	0.63	0.26	2.75	0.04	0.26	IFTRG067013	Call
3	10	Gold-Plated SST	1kV	Crimp	5	2.75" CF	0.63	0.26	2.75	0.04	0.39	IFTRG107013	Call
4	19	Gold-Plated SST	1kV	Crimp	5	2.75" CF	0.63	0.26	2.75	0.04	0.52	IFTRG197013	Call
5	32	Gold-Plated SST	1kV	Crimp	5	2.75" CF	0.63	0.26	2.75	0.04	0.72	IFTRG327013	Call
6	41	Gold-Plated SST	1kV	Crimp	5	3.375" CF	0.63	0.26	3.375	0.04	0.84	IFTRG417013A	Call

Refer to Connectors & Cabling, starting on page 3-113, for multi-pin circular connectors, set screw connectors, crimp/solder connectors, bare wire, and wire beads.

➤ MPC Multi-Pin, Circular

■ KF (QF) Flanged, Single-Ended

3

Feedthroughs

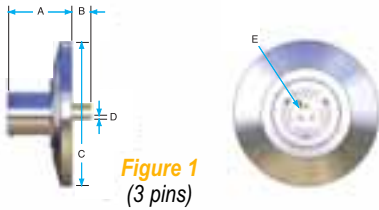


Figure 1
(3 pins)

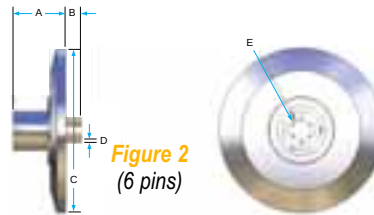


Figure 2
(6 pins)

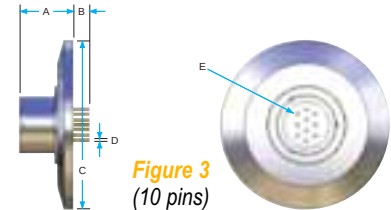


Figure 3
(10 pins)

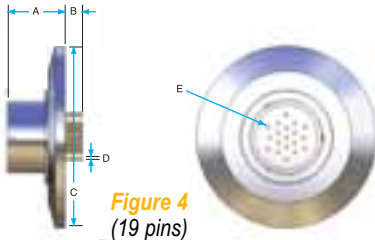


Figure 4
(19 pins)

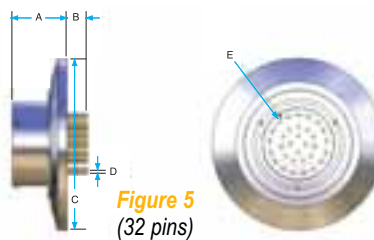


Figure 5
(32 pins)

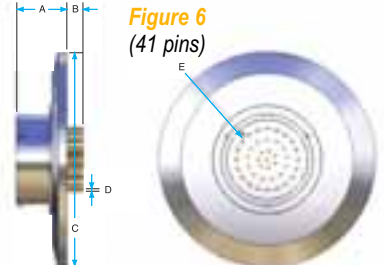


Figure 6
(41 pins)

Figure	# of Pins	Conductor Material	Voltage (DC)	Crimp or Solder	Amps/Pin	Flange Size	Dimensions (in.)					Part No.	Price
1	3	Gold-Plated SST	1kV	Crimp	5	KF25	0.69	0.21	1.57	0.04	0.15	IFTRG037018A	Call
2	6	Gold-Plated SST	1kV	Crimp	5	KF40	0.69	0.21	2.16	0.04	0.26	IFTRG067018B	Call
3	10	Gold-Plated SST	1kV	Crimp	5	KF40	0.69	0.21	2.16	0.04	0.39	IFTRG107018B	Call
4	19	Gold-Plated SST	1kV	Crimp	5	KF40	0.69	0.21	2.16	0.04	0.52	IFTRG197018B	Call
5	32	Gold-Plated SST	1kV	Crimp	5	KF40	0.69	0.21	2.16	0.04	0.72	IFTRG327018B	Call
6	41	Gold-Plated SST	1kV	Crimp	5	KF50	0.69	0.21	2.95	0.04	0.84	IFTRG417018C	Call

Refer to Connectors & Cabling, starting on page 3-113, for multi-pin circular connectors, set screw connectors, crimp/solder connectors, bare wire, and wire beads.

■ Weldable, Double-Ended

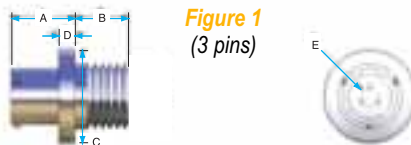


Figure 1
(3 pins)

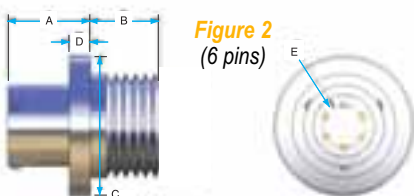


Figure 2
(6 pins)

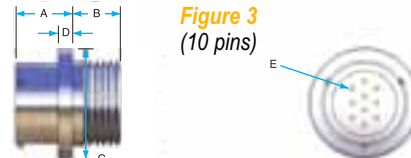


Figure 3
(10 pins)

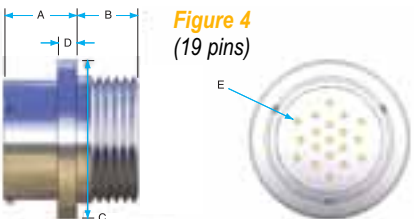


Figure 4
(19 pins)

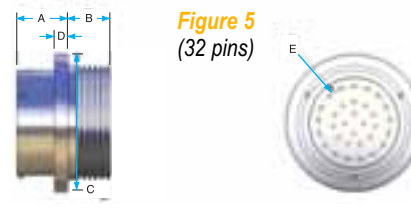


Figure 5
(32 pins)

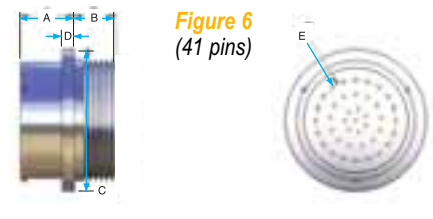


Figure 6
(41 pins)

Figure	# of Pins	Conductor Material	Voltage (DC)	Amps/Pin	Dimensions (in.)					Part No.	Price
1	3	Gold-Plated SST	1kV	5	0.51	0.43	0.745	0.13	0.15	IFDRG037011	Call
2	6	Gold-Plated SST	1kV	5	0.51	0.43	0.87	0.13	0.26	IFDRG067011	Call
3	10	Gold-Plated SST	1kV	5	0.51	0.43	0.995	0.13	0.39	IFDRG107011	Call
4	19	Gold-Plated SST	1kV	5	0.51	0.43	1.12	0.13	0.52	IFDRG197011	Call
5	32	Gold-Plated SST	1kV	5	0.51	0.43	1.37	0.13	0.72	IFDRG327011	Call
6	41	Gold-Plated SST	1kV	5	0.57	0.43	1.495	0.13	0.84	IFDRG417011	Call

Refer to Connectors & Cabling, starting on page 3-113, for multi-pin circular connectors.

➤ MPC Multi-Pin, Circular

■ CF Flange, Double-Ended

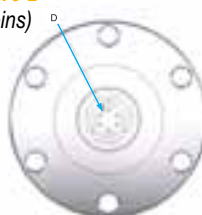
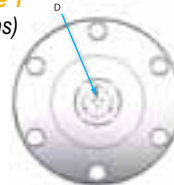
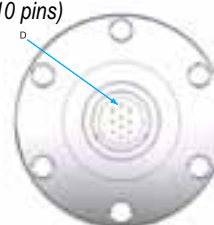
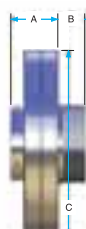
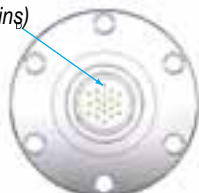
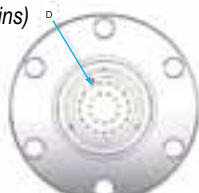
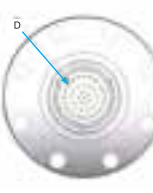
Figure 2
(6 pins)Figure 1
(3 pins)Figure 3
(10 pins)Figure 4
(19 pins)Figure 5
(32 pins)Figure 6
(41 pins)

Figure	# of Pins	Conductor Material	Voltage (DC)	Amps/Pin	Flange Size	Dimensions (in.)				Part No.	Price
1	3	Gold-Plated SST	1kV	5	2.75" CF	0.69	0.39	2.75	0.15	IFDRG037013	Call
2	6	Gold-Plated SST	1kV	5	2.75" CF	0.69	0.39	2.75	0.26	IFDRG067013	Call
3	10	Gold-Plated SST	1kV	5	2.75" CF	0.69	0.39	2.75	0.39	IFDRG107013	Call
4	19	Gold-Plated SST	1kV	5	2.75" CF	0.69	0.39	2.75	0.52	IFDRG197013	Call
5	32	Gold-Plated SST	1kV	5	2.75" CF	0.69	0.39	2.75	0.72	IFDRG327013	Call
6	41	Gold-Plated SST	1kV	5	3.375" CF	0.69	0.39	3.375	0.84	IFDRG417013A	Call

Refer to Connectors & Cabling, starting on page 3-113, for multi-pin circular connectors.

■ KF (QF) Flanged, Double-Ended

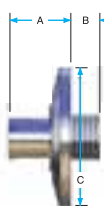
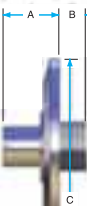
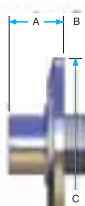
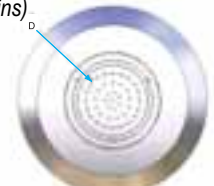
Figure 1
(3 pins)Figure 2
(6 pins)Figure 3
(10 pins)Figure 4
(19 pins)Figure 5
(32 pins)Figure 6
(41 pins)

Figure	# of Pins	Conductor Material	Voltage (DC)	Amps/Pin	Flange Size	Dimensions (in.)				Part No.	Price
1	3	Gold-Plated SST	1kV	5	KF25	0.69	0.33	1.57	0.15	IFDRG037018A	Call
2	6	Gold-Plated SST	1kV	5	KF40	0.69	0.33	2.16	0.26	IFDRG067018B	Call
3	10	Gold-Plated SST	1kV	5	KF40	0.69	0.33	2.16	0.39	IFDRG107018B	Call
4	19	Gold-Plated SST	1kV	5	KF40	0.69	0.33	2.16	0.52	IFDRG197018B	Call
5	32	Gold-Plated SST	1kV	5	KF40	0.69	0.33	2.16	0.72	IFDRG327018B	Call
6	41	Gold-Plated SST	1kV	5	KF50	0.69	0.33	2.95	0.84	IFDRG417018C	Call

Refer to Connectors & Cabling, starting on page 3-113, for multi-pin circular connectors.

➤ MPDT Sub D-Type

IN THIS SECTION ➤ MPDT Sub D-Type

Type D Series Feedthroughs:

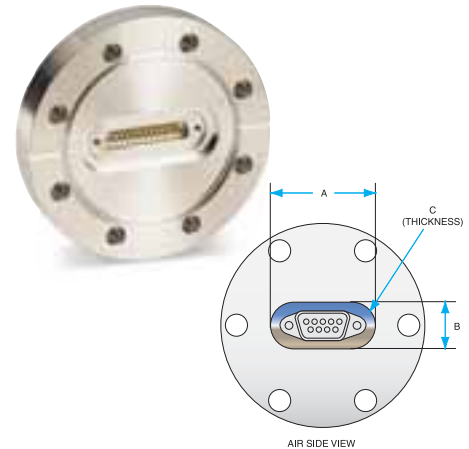
- Available in different pin densities, from 9- to 50-pin designs
- Vacuum-side connectors are made of PEEK (polyetheretherketone)
- 304L stainless steel shell offers corrosion-resistance and strength

CAUTION: We strongly recommend you do not purchase weldable versions of this feedthrough and attempt to mount them unless you have the proper special equipment and the high level of skill required to do this.

SPECIFICATIONS

Number of Pins: 9-50
Max. Voltage (DC): 500 VDC
Max. Current (per pin): 5A
Conductor: Ni-Fe Alloy
Connector Insulator: PEEK
Connector Type: Push On
Vacuum Application: HV or UHV
Temperature Range:
Weld Adapter, CF: 77K to +300° C
KF, O-Ring, NPT: -40° C to +150° C
Max. Ramp Rate: 25° C/minute
Air-Side Connector: 0° C to +35° C
Vac-Side Connector: 77K to +350° C

■ CF Flanged



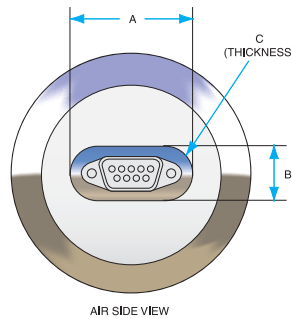
3

Feedthroughs

Flange Size	# of Pins	Dimensions (mm)			Part Number	Price
		A	B	C		
2.75" CF	9	33.00	14.50	17.00	IFDGG091053	Call
4.5" CF	15	38.00	16.50	17.00	IFDGG151056	Call
4.5" CF	25	55.00	19.00	17.00	IFDGG251056	Call
4.5" CF	50 (2 x 25)	55.00	19.00	17.00	IFDGG251056X	Call
6" CF	37	70.00	19.00	17.00	IFDGG371056A	Call
6" CF	50	68.00	19.00	17.00	IFDGG501056A	Call

Refer to Connectors & Cabling, starting on page 3-113, for PEEK connectors, contacts, bare wire, ribbon cables, and coaxial cables.

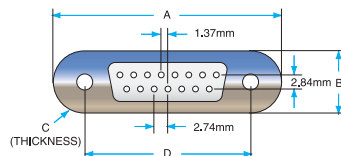
■ KF (QF) / ISO Flanged



Flange Size	# of Pins	Dimensions (mm)			Part Number	Price
		A	B	C		
KF40	9	33.00	14.50	17.00	IFDGG091058B	Call
KF50	15	38.00	16.50	17.00	IFDGG151058C	Call
ISO63-K	25	55.00	19.00	17.00	IFDGG251058D	Call
ISO100-K	37	70.00	19.00	17.00	IFDGG371058F	Call
ISO100-K	50	68.00	19.00	17.00	IFDGG501058F	Call

Refer to Connectors & Cabling, starting on page 3-113, for PEEK connectors, contacts, bare wire, ribbon cables, and coaxial cables.

■ Weldable



# of Pins	Dimensions (mm)				Part Number	Price
	A	B	C	D		
9	33.00	14.50	17.00	25.00	IFDGG091051	Call
15	38.00	16.50	17.00	33.33	IFDGG151051	Call
25	55.00	19.00	17.00	47.04	IFDGG251051	Call
37	70.00	19.00	17.00	63.50	IFDGG371051	Call
50	68.00	19.00	17.00	61.10	IFDGG501051	Call

Refer to Connectors & Cabling, starting on page 3-113, for PEEK connectors, contacts, bare wire, ribbon cables, and coaxial cables.

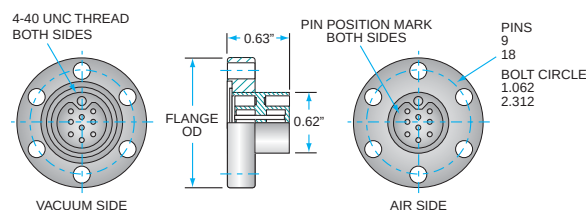
➤ **Subminiature-C Multipin****IN THIS SECTION ➤**
Subminiature-C Multipin

Multipin Hermetic Feedthroughs:

- 9-pin configuration
- 250C high-temperature rated
- UHV compatible construction
- CF and QF flange mounts
- Kapton® insulated vacuum cables
- PEEK vacuum connectors
- Delrin® atmosphere connectors
- Custom versions available on request

SPECIFICATIONS

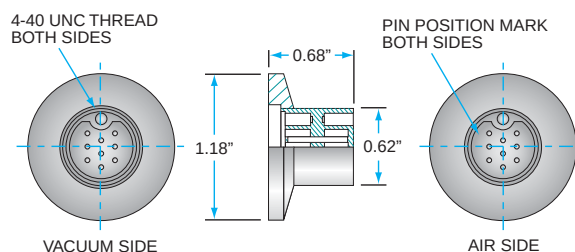
for CF Flange & KF Flange

Vacuum Application:UHV: 1×10^{-10} TorrHV: 1×10^{-8} Torr**Maximum Current:** 5A @ 20° C**Maximum Voltage:** 300V**Temperature:****Feedthrough:** 250° C**CF Flange:** 450° C**KF Flange:** 150° C**Connector, Air:** 80° C**Connector, Vacuum:** 250° C**Thermal Gradient:** 25° C/ minute**Materials:****Shell:** Stainless Steel**Pins:** Ni-Fe Alloy, Gold Plated**Seal & Insulation:** Glass-Ceramic**Connector, Air:** Delrin**Connector, Vacuum:** PEEK■ **CF Flange**

Flange Size	# of Pins	Vac Side Configuration	Description	Part No.	Price
1.33"CF	9	Gold-Plated Ni-Fe	9-Pin Feedthrough, 1.33" CF	IFDJG091052	Call
1.33"CF	9	Gold-Plated Ni-Fe	9-Pin Feedthrough Kit, 1.33" CF*	IFDJG091052K	Call
2.75"CF	9	Gold-Plated Ni-Fe	9-Pin Feedthrough, 2.75" CF	IFDJG091053	Call
2.75"CF	18 (2x9-Pin)	Gold-Plated Ni-Fe	(2)x9-Pin Feedthrough, 2.75" CF	IFDJG181053	Call

Refer to Connectors & Cabling, on next page, for coaxial connectors, $\frac{1}{8}$ " & $\frac{1}{4}$ " cables.

*Kit includes air & vacuum connectors with 8" and 19" cable lengths, respectively.

■ **KF (QF) Flange**

Flange Size	# of Pins	Vac Side Configuration	Description	Part No.	Price
KF16	9	Gold-Plated Ni-Fe	9-Pin Feedthrough, KF16	IFDJG091058	Call
KF16	9	Gold-Plated Ni-Fe	9-Pin Feedthrough Kit, KF16*	IFDJG091058K	Call
KF40	9	Gold-Plated Ni-Fe	9-Pin Feedthrough, KF40	IFDJG091058B	Call
KF40	18 (2x9-Pin)	Gold-Plated Ni-Fe	(2)x9-Pin Feedthrough, KF40	IFDJG181058B	Call

Refer to Connectors & Cabling, on next page, for coaxial connectors, $\frac{1}{8}$ " & $\frac{1}{4}$ " cables.

*Kit includes air & vacuum connectors with 8" and 19" cable lengths, respectively.

➤ Ribbon, Round, UHV, Air-Side Cable Assemblies

3

Feedthroughs

IN THIS SECTION ➤

Ribbon, Round, UHV Cable Assemblies

- 600 VAC, 2k VDC
- 2A
- Silver-Plated Copper Conductor
- Kapton Type-F Film Insulated
- Vacuum Range – 1×10^{-10} Torr
- Temperature – 250° C
- Gold Plated Ni-Fe Alloy Pins/Sockets

Air-Side Cable Assemblies

- Delrin Connector
- 600 VAC, 2k VDC
- 2A
- Silver-Plated Copper Conductor
- PVC Insulated
- Gold Plated Ni-Fe Alloy Pins/Sockets



■ Ribbon & Round Cable Assemblies

Connection Side	Type	Style	Service	Overall Length	Part No.	Price
Female	Extension Cable	Round	UHV	19"	FTACVC19CC	Call
Male	Cable to Contact	Round	UHV	19"	FTACVC919P	Call
Male	Connector Fitted Cable	Round	UHV	19"	FTACVC919PC	Call
Female	Cable to Contact	Round	UHV	19"	FTACVC919S	Call
Female	Connector Fitted Cable	Round	UHV	19"	FTACVC919SC	Call
Male	Cable to Contact	Round	UHV	39"	FTACVC939P	Call
Male	Connector Fitted Cable	Round	UHV	39"	FTACVC939PC	Call
Female	Cable to Contact	Round	UHV	39"	FTACVC939S	Call
Female	Connector Fitted Cable	Round	UHV	39"	FTACVC939SC	Call
Female	Extension Cable	Ribbon	UHV	19"	FTACVR19CC	Call
Male	Cable to Contact	Ribbon	UHV	19"	FTACVR919P	Call
Male	Connector Fitted Cable	Ribbon	UHV	19"	FTACVR919PC	Call
Female	Cable to Contact	Ribbon	UHV	19"	FTACVR919S	Call
Female	Connector Fitted Cable	Ribbon	UHV	19"	FTACVR919SC	Call
Male	Cable to Contact	Ribbon	UHV	39"	FTACVR939P	Call
Male	Connector Fitted Cable	Ribbon	UHV	39"	FTACVR939PC	Call
Female	Cable to Contact	Ribbon	UHV	39"	FTACVR939S	Call
Female	Connector Fitted Cable	Ribbon	UHV	39"	FTACVR939SC	Call

■ Individual UHV & Air Side Cable Assemblies

Connection Side	Service	Overall Length	Part No.	Price
Female	AIR	48"	FTACAC948SC	Call
Female	AIR	96"	FTACAC996SC	Call
Male	UHV	19"	FTACVK119P	Call
Female	UHV	19"	FTACVK119S	Call
Male	UHV	39"	FTACVK139P	Call
Female	UHV	39"	FTACVK139S	Call



➤ **MS Multi-Pin****IN THIS SECTION ➤****MS Multi-Pin**

- Work with MS circular connectors—solid-shell, straight-threaded connectors with polarized keyways
- Silver-plated contacts have pre-tinned solder pockets
- Single-Ended version includes air-side connector (vacuum-side crimp connectors are available as accessories)
- Double-Ended version includes both air- and vacuum-side connector

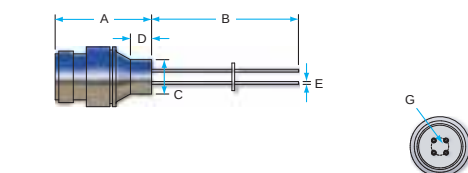
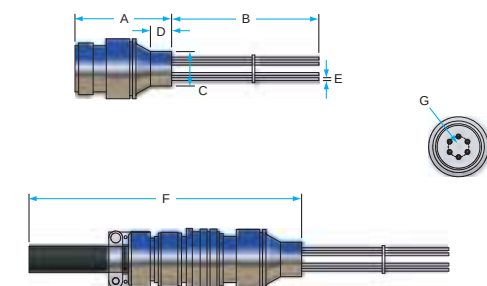
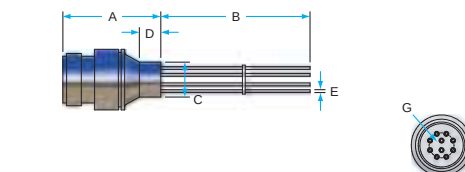
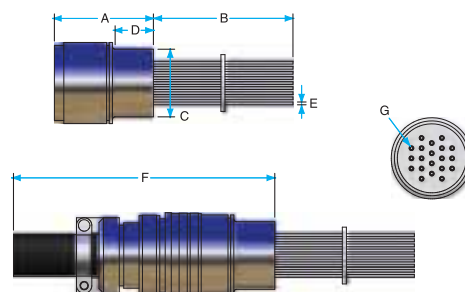
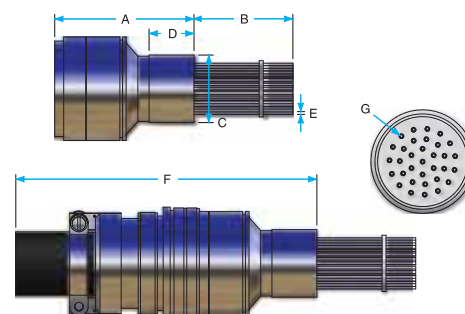
**Figure 1 (4 pins)****Figure 2 (6 pins)****Figure 3 (10 pins)****Figure 4 (20 pins)****Figure 5 (35 pins)**

Figure	# of Pins	Conductor Material	Voltage (DC)	Amps/Pin	Dimensions (in.)								Part No.	Price
1	4	Alumel®	700	10	2.35	3.19	0.747	0.47	0.056	4.03	0.38		IFTAG045101	Call
2	6	Alumel	700	10	2.35	3.19	0.747	0.47	0.056	4.03	0.44		IFTAG065101	Call
3	10	Alumel	700	10	2.35	3.19	0.747	0.47	0.056	4.03	0.51		IFTAG105101	Call
3	10	Molybdenum	700	10	2.35	3.19	0.747	0.47	0.032	4.03	0.51		IFTAG104101	Call
4	20	Alumel	700	10	2.53	3.50	1.372	0.75	0.056	4.78	1.03		IFTAG205101	Call
4	20	Molybdenum	700	10	2.53	3.50	1.372	0.75	0.032	4.78	1.03		IFTAG204101	Call
5	35	Alumel	700	10	3.98	2.10	1.50	1.94	0.056	6.33	1.22		IFTAG355101	Call

Refer to Connectors & Cabling, starting on page 3-113, for mil-spec connectors, inline barrel connectors, set screw connectors, crimp/solder connectors, bare wire, wire beads, and ceramic wire discs.

➤ **MS Multi-Pin**

■ **CF Flange, Single-Ended**

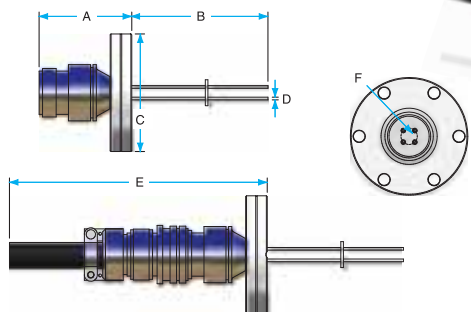


Figure 1 (4 pins)

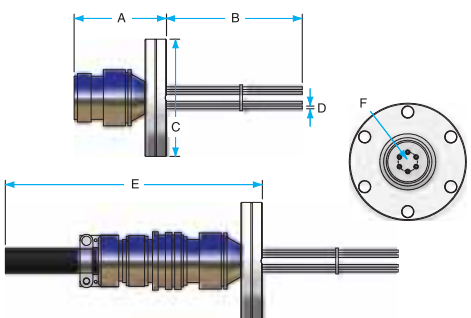


Figure 2 (6 pins)

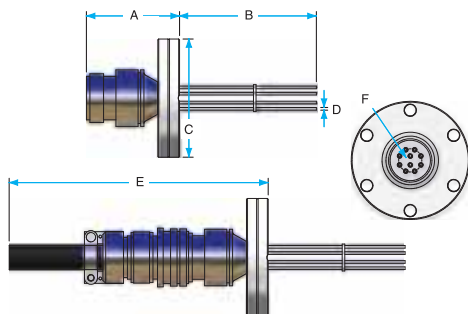


Figure 3 (10 pins)

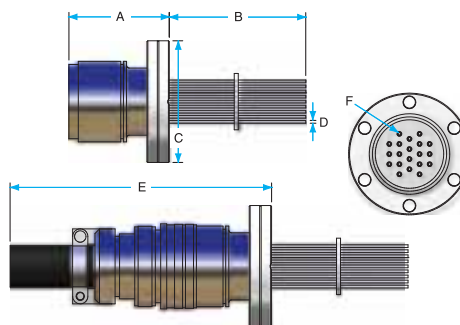


Figure 4 (20 pins)

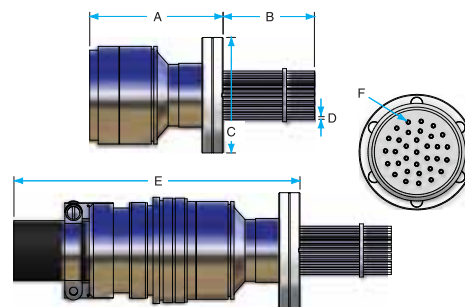


Figure 5 (35 pins)

Figure	# of Pins	Conductor Material	Flange Size	Voltage (DC)	Amps/ Pin	Dimensions (in.)						Part No.	Price
1	4	Alumel®	1.33" CF	700V	10	2.85	2.69	1.33	0.056	4.53	0.38	IFTAG045102	Call
1	4	Alumel	2.75" CF	700V	10	2.35	3.19	2.75	0.056	4.03	0.38	IFTAG045103	Call
2	6	Alumel	1.33" CF	700V	10	2.85	2.69	1.33	0.056	4.53	0.44	IFTAG065102	Call
2	6	Alumel	2.75" CF	700V	10	2.35	3.19	2.75	0.056	4.03	0.44	IFTAG065103	Call
3	10	Molybdenum	1.33" CF	700V	10	2.85	2.69	1.33	0.032	4.53	0.51	IFTAG104102	Call
3	10	Molybdenum	2.75" CF	700V	10	2.35	3.19	2.75	0.032	4.03	0.51	IFTAG104103	Call
3	10	Alumel	1.33" CF	700V	10	2.85	2.69	1.33	0.056	4.53	0.51	IFTAG105102	Call
3	10	Alumel	2.75" CF	700V	10	2.35	3.19	2.75	0.056	4.03	0.51	IFTAG105103	Call
4	20	Molybdenum	2.75" CF	700V	10	2.53	3.50	2.75	0.032	4.78	1.03	IFTAG204103	Call
4	20	Alumel	2.75" CF	700V	10	2.53	3.50	2.75	0.056	4.78	1.03	IFTAG205103	Call
5	35	Alumel	2.75" CF	700V	10	3.98	2.10	2.75	0.056	6.33	1.22	IFTAG355103	Call
5	35	Alumel	4.5" CF	700V	10	3.98	2.10	4.50	0.056	6.33	1.22	IFTAG355106	Call

Refer to Connectors & Cabling, starting on page 3-113, for mil-spec connectors, inline barrel connectors, set screw connectors, crimp/solder connectors, bare wire, wire beads, and ceramic wire discs.

► MS Multi-Pin

■ KF (QF) Flange, Single-Ended

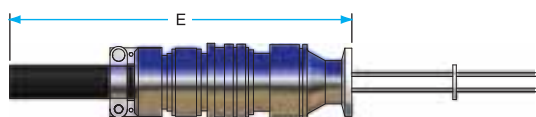
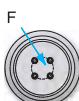
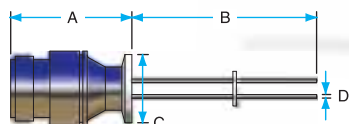


Figure 1 (4 pins)

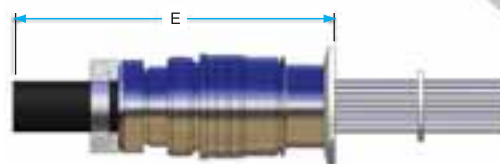
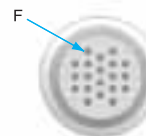
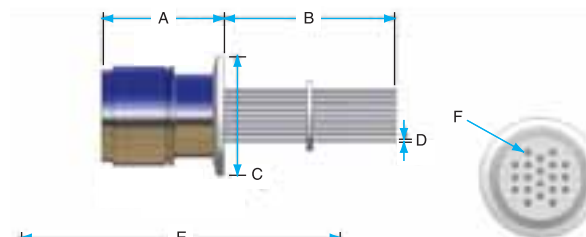


Figure 4 (20 pins)

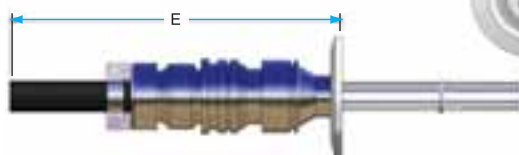
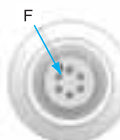
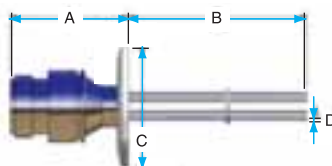


Figure 2 (6 pins)

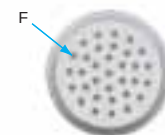
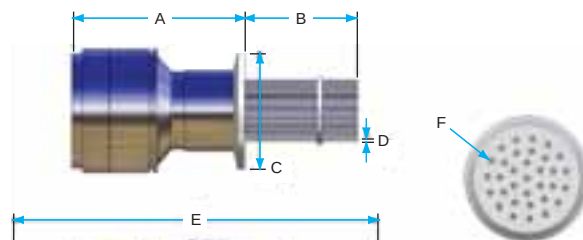


Figure 5 (35 pins)

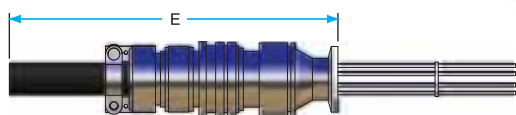
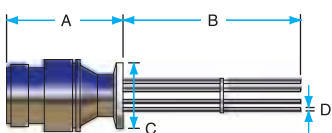


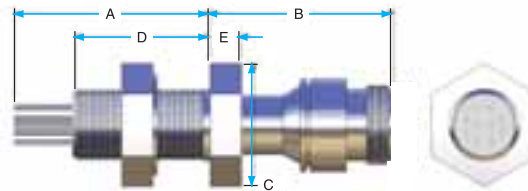
Figure 3 (10 pins)

■ **KF (QF) Flange, Single-Ended**

Figure	# of Pins	Conductor Material	Flange Size	Voltage (DC)	Amps/Pin	Dimensions (in.)								Part No.	Price
1	4	Alumel®	KF16	700V	10	2.35	3.19	1.18	0.056	4.03	0.38	N/A	IFTAG045108	Call	
1	4	Alumel	KF40	700V	10	2.35	3.19	2.16	0.056	4.03	0.38	N/A	IFTAG045108B	Call	
2	6	Alumel	KF16	700V	10	2.35	3.19	1.18	0.056	4.03	0.44	N/A	IFTAG065108	Call	
2	6	Alumel	KF25	700V	10	2.35	3.19	1.57	0.056	4.03	0.44	N/A	IFTAG065108A	Call	
2	6	Alumel	KF40	700V	10	2.35	3.19	2.16	0.056	4.03	0.44	N/A	IFTAG065108B	Call	
3	10	Molybdenum	KF16	700V	10	2.35	3.19	1.18	0.032	4.03	0.51	N/A	IFTAG104108	Call	
3	10	Molybdenum	KF25	700V	10	2.35	3.19	1.57	0.032	4.03	0.51	N/A	IFTAG104108A	Call	
3	10	Molybdenum	KF40	700V	10	2.35	3.19	2.16	0.032	4.03	0.51	N/A	IFTAG104108B	Call	
3	10	Molybdenum	KF50	700V	10	2.35	3.19	2.95	0.032	4.03	0.51	N/A	IFTAG104108C	Call	
3	10	Alumel	KF16	700V	10	2.35	3.19	1.18	0.056	4.03	0.51	N/A	IFTAG105108	Call	
3	10	Alumel	KF25	700V	10	2.35	3.19	1.57	0.056	4.03	0.51	N/A	IFTAG105108A	Call	
3	10	Alumel	KF40	700V	10	2.35	3.19	2.16	0.056	4.03	0.51	N/A	IFTAG105108B	Call	
3	10	Alumel	KF50	700V	10	2.35	3.19	2.95	0.056	4.03	0.51	N/A	IFTAG105108C	Call	
4	20	Molybdenum	KF40	700V	10	2.53	3.50	2.16	0.032	4.78	1.03	N/A	IFTAG204108B	Call	
4	20	Molybdenum	KF50	700V	10	2.53	3.50	2.95	0.032	4.78	1.03	N/A	IFTAG204108C	Call	
4	20	Alumel	KF40	700V	10	2.53	3.50	2.16	0.056	4.78	1.03	N/A	IFTAG205108B	Call	
4	20	Alumel	KF50	700V	10	2.53	3.50	2.95	0.056	4.78	1.03	N/A	IFTAG205108C	Call	
5	35	Alumel	KF40	700V	10	3.98	2.10	2.16	0.056	6.33	6.33	N/A	IFTAG355108B	Call	
5	35	Alumel	KF50	700V	10	3.98	2.10	2.95	0.056	6.33	6.33	N/A	IFTAG355108C	Call	

Refer to Connectors & Cabling, starting on page 3-113, for mil-spec connectors, inline barrel connectors, set screw connectors, crimp/solder connectors, bare wire, wire beads, and ceramic wire discs.

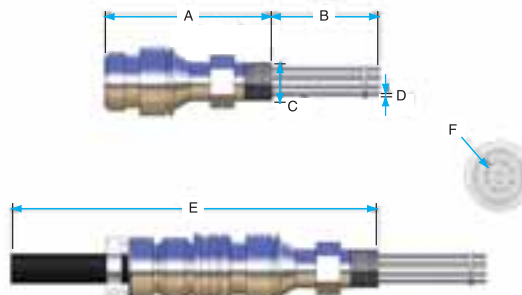
■ **1" Baseplate, Single-Ended**



# of Pins	Conductor Material	Voltage Mounting	(DC)	Amps/Pin	Dimensions (in.)					Part No.	Price
10	Alumel	1" BP	700V	10	2.72	2.60	1.50	1.90	0.44	IFTAG105104	Call

Refer to Connectors & Cabling, starting on page 3-113, for mil-spec connectors, inline barrel connectors, set screw connectors, crimp/solder connectors, bare wire, wire beads, and ceramic wire discs.

■ **NPT, Single-Ended**



# of Pins	Mounting	Conductor Material	Voltage (DC)	Amps/Pin	Dimensions (in.)						Part No.	Price
10	1/2" NPT	Alumel	700V	10	3.49	2.06	0.84	0.056	5.32	0.51	IFTAG105105	Call

Refer to Connectors & Cabling, starting on page 3-113, for mil-spec connectors, inline barrel connectors, set screw connectors, crimp/solder connectors, bare wire, wire beads, and ceramic wire discs.

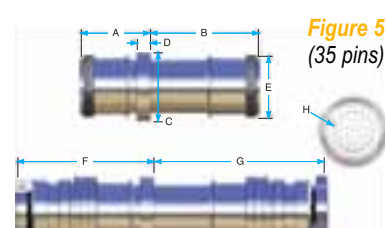
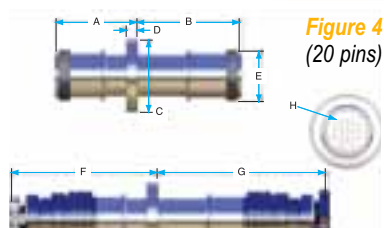
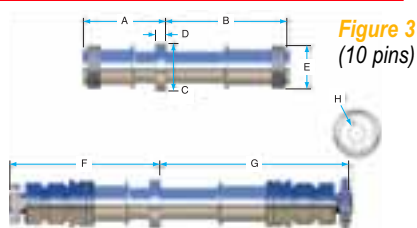
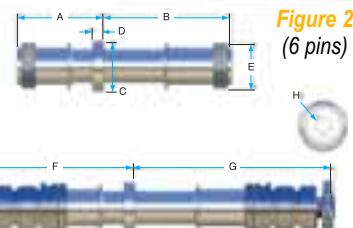
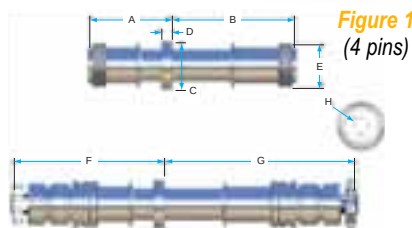
➤ **MS Multi-Pin**■ **Weldable, Double-Ended**

Figure	# of Pins	Conductor Material	Voltage (DC)	Amps/Pin	Dimensions (in.)								Part No.	Price
					A	B	C	D	E	F	G	H		
1	4	Alumel®	700V	10	2.36	3.49	1.372	0.31	1.25	4.19	5.32	0.38	IFDAG045101	Call
2	6	Alumel	700V	10	2.36	3.49	1.372	0.31	1.25	4.19	5.32	0.44	IFDAG065101	Call
3	10	Alumel	700V	10	2.36	3.49	1.372	0.31	1.25	4.19	5.32	0.51	IFDAG105101	Call
4	20	Alumel	700V	10	2.78	3.50	2.495	0.31	1.75	5.03	5.75	1.03	IFDAG205101	Call
5	35	Alumel	700V	10	2.50	3.89	2.495	0.31	2.25	4.85	6.24	1.22	IFDAG355101	Call

Refer to Connectors & Cabling, starting on page 3-113, for mil-spec connectors.

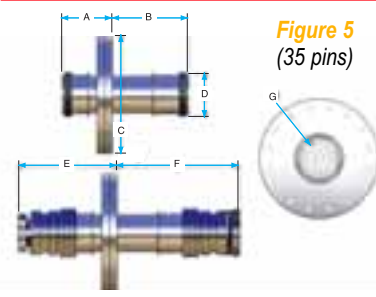
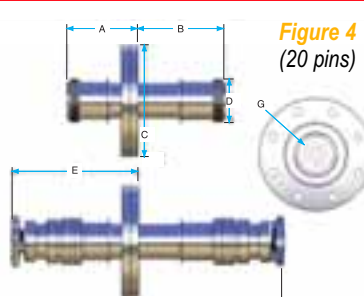
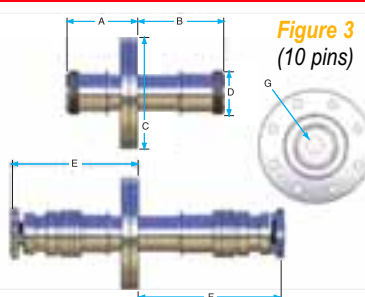
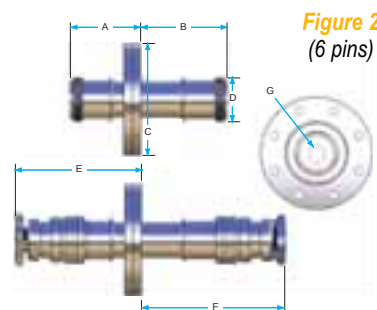
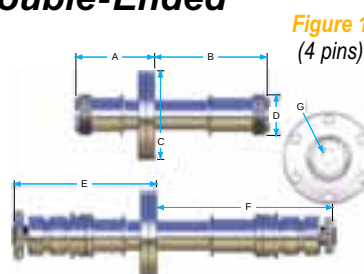
■ **CF Flange, Double-Ended**

Figure	# of Pins	Conductor Material	Flange Size	Voltage (DC)	Amps/Pin	Dimensions (in.)								Part No.	Price
						A	B	C	D	E	F	G			
1	4	Alumel	2.75" CF	700V	10	2.36	3.49	2.75	1.25	4.19	5.32	0.38	IFDAG045103	Call	
2	6	Alumel	2.75" CF	700V	10	2.36	3.49	2.75	1.25	4.19	5.32	0.44	IFDAG065103	Call	
3	10	Alumel	2.75" CF	700V	10	2.36	3.49	2.75	1.25	4.19	5.32	0.51	IFDAG105103	Call	
4	20	Alumel	4.5" CF	700V	10	2.78	3.50	4.50	1.75	5.03	5.75	1.03	IFDAG205106	Call	
5	35	Alumel	4.5" CF	700V	10	2.50	3.89	4.50	2.25	4.85	6.24	1.22	IFDAG355106	Call	

Refer to Connectors & Cabling, starting on page 3-113, for mil-spec connectors.

➤ **MS Multi-Pin**

■ **KF (QF)/ISO Flange, Double-Ended**

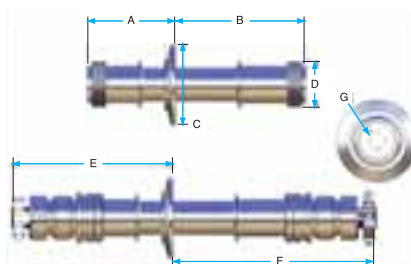


Figure 1 (4 pins)

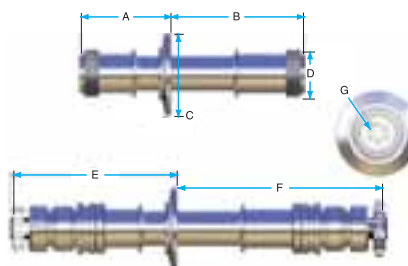


Figure 2 (6 pins)

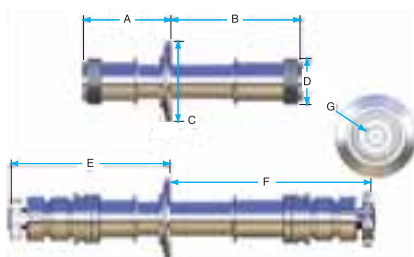


Figure 3 (10 pins)

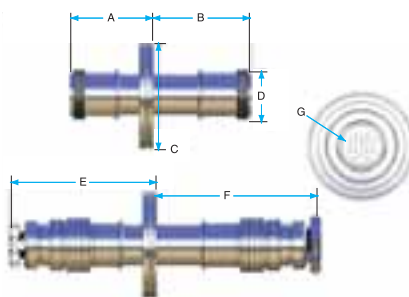


Figure 4 (20 pins)

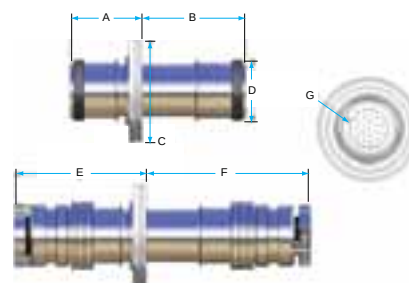
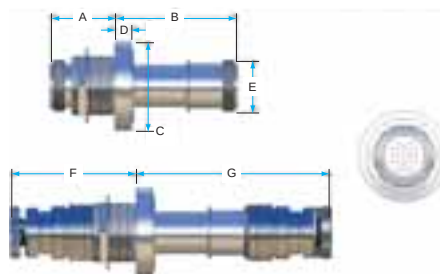


Figure 5 (35 pins)

Figure	# of Pins	Conductor Material	Flange Size	Voltage (DC)	Amps/Pin	Dimensions (in.)								Part No.	Price
						A	B	C	D	E	F	G			
1	4	Alumel®	KF40	700V	10	2.36	3.49	2.16	1.25	4.19	5.32	0.38	IFDAG045108B	Call	
1	4	Alumel	KF50	700V	10	2.36	3.49	2.95	1.25	4.19	5.32	0.38	IFDAG045108C	Call	
2	6	Alumel	KF40	700V	10	2.36	3.49	2.16	1.25	4.19	5.32	0.44	IFDAG065108B	Call	
2	6	Alumel	KF50	700V	10	2.36	3.49	2.95	1.25	4.19	5.32	0.44	IFDAG065108C	Call	
3	10	Alumel	KF40	700V	10	2.36	3.49	2.16	1.25	4.19	5.32	0.51	IFDAG105108B	Call	
3	10	Alumel	KF50	700V	10	2.36	3.49	2.95	1.25	4.19	5.32	0.51	IFDAG105108C	Call	
4	20	Alumel	ISO63-K	700V	10	2.78	3.50	3.74	1.75	5.03	5.75	1.03	IFDAG205108D	Call	
5	35	Alumel	ISO100-K	700V	10	2.50	3.89	5.12	2.25	4.85	6.24	1.22	IFDAG355108F	Call	

Refer to Connectors & Cabling, starting on page 3-113, for mil-spec connectors.

■ **Baseplate, Double-Ended**



# of Pins	Conductor Material	Mounting	Voltage (DC)	Amps/Pin	Dimensions (in.)								Part No.	Price
1	Alumel	2" BP	700V	10	2.16	4.10	3.00	0.63	1.75	4.41	6.37		IFDAG205104D	Call

Refer to Connectors & Cabling, starting on page 3-113, for mil-spec connectors.

MPT Multi-Pin

IN THIS SECTION ➤
MPT

MPT Multi-Pin single-ended feedthroughs:

- Available with 3, 5, or 7 nickel-clad molybdenum pins, and weldable terminations, CF flanges, or KF flanges
- Includes one air-side connector (vacuum-side crimp connectors are available as accessories)

Weldable, Single-Ended

SPECIFICATIONS

Number of Pins: 3–7
Max. Voltage (DC): 500 VDC
Max. Current (per Pin): 3.5A
Conductor: Molybdenum
F/T Insulator: Alumina
Connector Insulator: Plastic
Connector Type: Screw Thread
Vacuum Application: HV or UHV

Temperature Range:
Weld Adapter, CF: Ambient to +450° C
KF, O-Ring, NPT: -40° C to +150° C
Max. Ramp Rate: 25° C/minute
Air-Side Connector: 0° C to +35° C

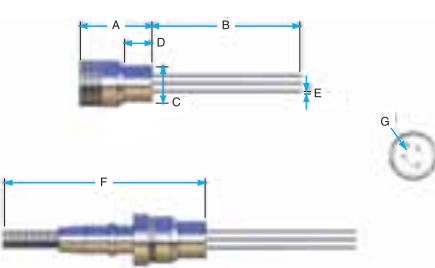


Figure 1 (3 pins)

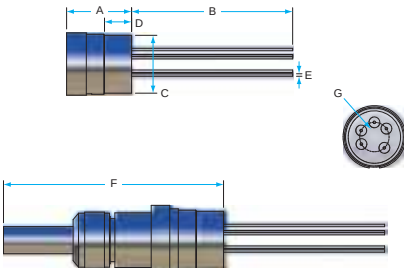


Figure 2 (5 pins)

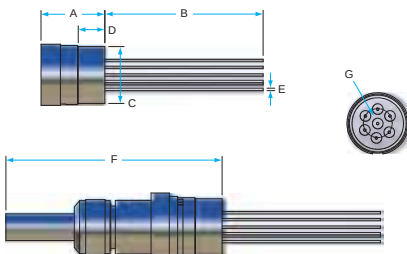


Figure 3 (7 pins)

Figure	# of Pins	Conductor Material	Voltage (DC)	Amps/Pin	Dimensions (in.)							Part No.	Price
					A	B	C	D	E	F	G		
1	3	Molybdenum	500V	3.5	0.97	2.01	0.497	0.37	0.032	2.00	0.25	IFTAG034031	Call
2	5	Molybdenum	500V	3.5	0.84	2.08	0.747	0.35	0.032	2.00	0.38	IFTAG054031	Call
3	7	Molybdenum	500V	3.5	0.84	2.08	0.747	0.35	0.032	2.00	0.38	IFTAG074031	Call

Refer to Connectors & Cabling, starting on page 3-113, for mil-spec connectors, inline barrel connectors, set screw connectors, crimp/solder connectors, bare wire, wire beads, and ceramic wire discs.

CF Flange, Single-Ended

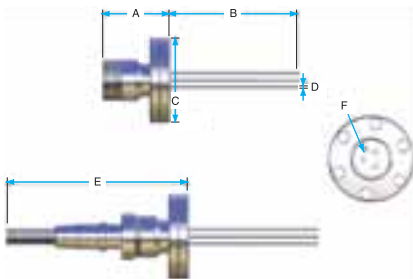


Figure 1B (3 pins)

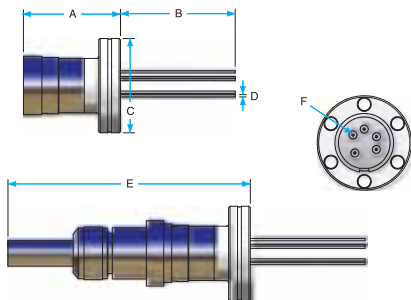


Figure 2B (5 pins)

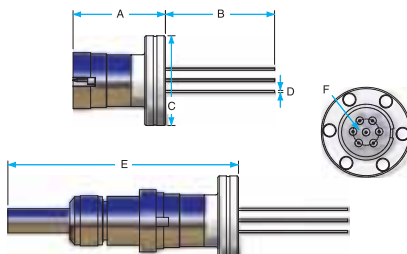


Figure 3B (7 pins)

➤ **MPT Multi-Pin**

■ **CF Flange, Single-Ended (continued)**

SPECIFICATIONS

Conductor: Molybdenum
F/T Insulator: Alumina
Connector Insulator: Plastic
Connector Type: Screw Thread
Vacuum Application: HV or UHV
Temperature Range:
Weld Adapter, CF: Ambient to +450° C
KF, O-Ring, NPT: -40° C to +150° C
Max. Ramp Rate: 25° C/minute
Air-Side Connector: 0° C to +35° C



3

Feedthroughs

Figure	# of Pins	Flange Size	Conductor Material	Voltage (DC)	Amps/Pin	Dimensions (in.)						Part No.	Price
1B	3	1.33" CF	Molybdenum	500V	3.5	0.97	2.01	1.33	0.032	2.00	0.25	IFTAG034032	Call
1B	3	2.75" CF	Molybdenum	500V	3.5	0.97	2.01	2.75	0.032	2.00	0.25	IFTAG034033	Call
2B	5	1.33" CF	Molybdenum	500V	3.5	1.34	1.58	1.33	0.032	2.50	0.38	IFTAG054032	Call
2B	5	2.75" CF	Molybdenum	500V	3.5	0.84	2.08	2.75	0.032	2.00	0.38	IFTAG054033	Call
3B	7	1.33" CF	Molybdenum	500V	3.5	1.34	1.58	1.33	0.032	2.50	0.38	IFTAG074032	Call
3B	7	2.75" CF	Molybdenum	500V	3.5	0.84	2.08	2.75	0.032	2.00	0.38	IFTAG074033	Call

Refer to Connectors & Cabling, starting on page 3-113, for mil-spec connectors, inline barrel connectors, set screw connectors, crimp/solder connectors, bare wire, wire beads, and ceramic wire discs.

Note: See figures on page 3-66.

■ **KF (QF) Flange, Single-Ended**

SPECIFICATIONS

Conductor: Molybdenum
F/T Insulator: Alumina
Connector Insulator: Plastic
Connector Type: Screw Thread
Vacuum Application: HV or UHV
Temperature Range:
Weld Adapter, CF: RT to +450° C
KF, O-Ring, NPT: -40° C to +150° C
Max. Ramp Rate: 25° C/minute
Air-Side Connector: 0° C to +35° C
Vac-Side Connector: 200K to +450° C

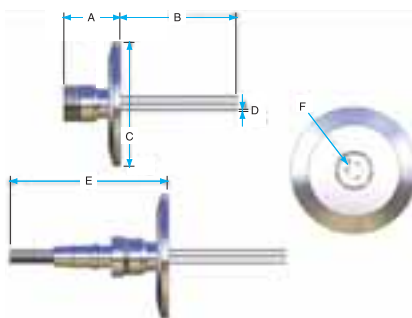


Figure 1 (3 pins)

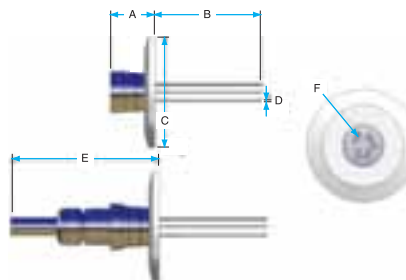


Figure 2 (5 pins)

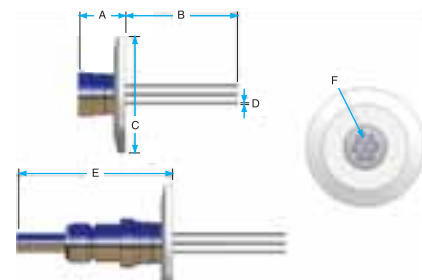


Figure 3 (7 pins)

Figure	# of Pins	Flange Size	Conductor Material	Voltage (DC)	Amps/Pin	Dimensions (in.)						Part No.	Price
1	3	KF16	Molybdenum	500V	3.5	0.97	2.01	1.18	0.032	2.00	0.25	IFTAG034038	Call
1	3	KF40	Molybdenum	500V	3.5	0.97	2.01	2.16	0.032	2.00	0.25	IFTAG034038B	Call
2	5	KF16	Molybdenum	500V	3.5	0.84	2.08	1.18	0.032	2.00	0.38	IFTAG054038	Call
2	5	KF25	Molybdenum	500V	3.5	0.84	2.08	1.57	0.032	2.00	0.38	IFTAG054038A	Call
2	5	KF40	Molybdenum	500V	3.5	0.84	2.08	2.16	0.032	2.00	0.38	IFTAG054038B	Call
2	3	KF50	Molybdenum	500V	3.5	0.84	2.08	2.95	0.032	2.00	0.38	IFTAG054038C	Call
3	7	KF16	Molybdenum	500V	3.5	0.84	2.08	1.18	0.032	2.00	0.38	IFTAG074038	Call
3	7	KF25	Molybdenum	500V	3.5	0.84	2.08	1.57	0.032	2.00	0.38	IFTAG074038A	Call
3	7	KF40	Molybdenum	500V	3.5	0.84	2.08	2.16	0.032	2.00	0.38	IFTAG074038B	Call
3	7	KF50	Molybdenum	500V	3.5	0.84	2.08	2.95	0.032	2.00	0.38	IFTAG074038C	Call

Refer to Connectors & Cabling, starting on page 3-113, for mil-spec connectors, inline barrel connectors, set screw connectors, crimp/solder connectors, bare wire, wire beads, and ceramic wire discs.

➤ Type C Mini Plug

IN THIS SECTION ➤

Type C Miniature Connectors

- Feature positive wires made of Tungsten/5% Rhenium and negative wires of Tungsten/26% Rhenium
- Temperature range between 0° C and 2,315° C
- Can be used with refractory-metal thermocouples
- Rated for use in high and ultrahigh vacuum applications
- Include air-side connectors
- Vacuum-side leads terminate in thermocouple lugs, which include a stainless steel nut and screw to facilitate thermocouple hookup

■ Weldable

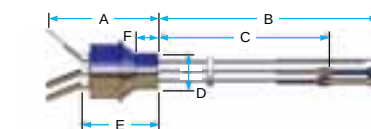
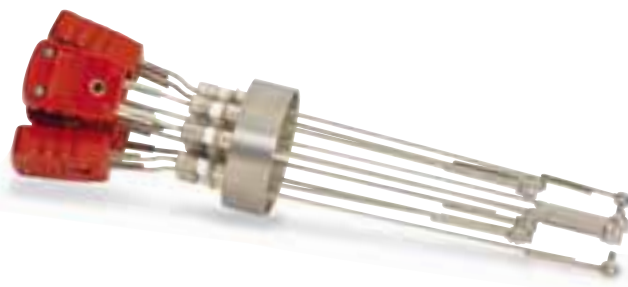


Figure 3 (3 pairs)

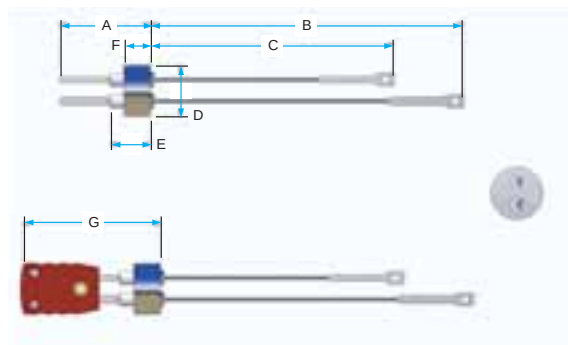


Figure 1 (1 pair)

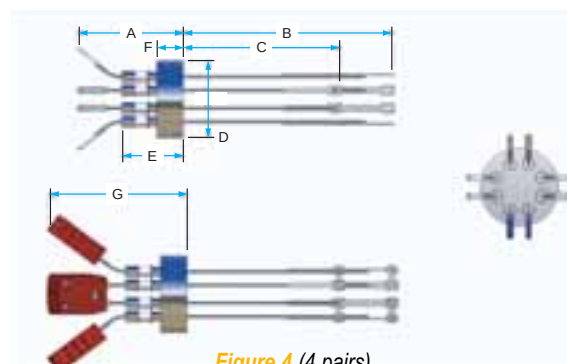


Figure 4 (4 pairs)

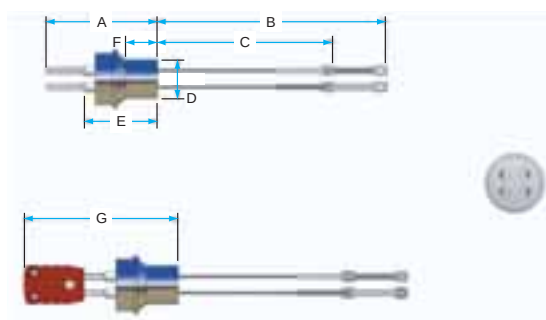


Figure 2 (2 pairs)

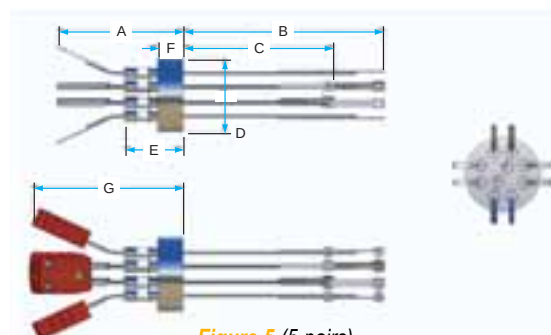


Figure 5 (5 pairs)

Figure	Air Side	Vac. Side	T/C Pairs	Dimensions (in.)							Part No.	Price
1	Miniature Plug	Nut/Bolt	1	A	B	C	D	E	F	G	TFT1CY00001	Call
2	Miniature Plug	Nut/Bolt	2	2.11	4.50	3.50	0.747	1.38	0.60	2.72	TFT2CY00001	Call
3	Miniature Plug	Nut/Bolt	3	2.26	4.50	3.50	0.747	1.58	0.47	2.90	TFT3CY00001	Call
4	Miniature Plug	Nut/Bolt	4	2.00	4.00	3.00	1.495	1.16	0.50	2.50	TFT4CY00001	Call
5	Miniature Plug	Nut/Bolt	5	2.50	4.00	3.00	1.495	1.16	0.50	3.00	TFT5CY00001	Call

Refer to Connectors & Cabling, starting on page 3-113, for miniature connectors, t/c wire, and wire beads.

► Type C Mini Plug

■ CF Flange

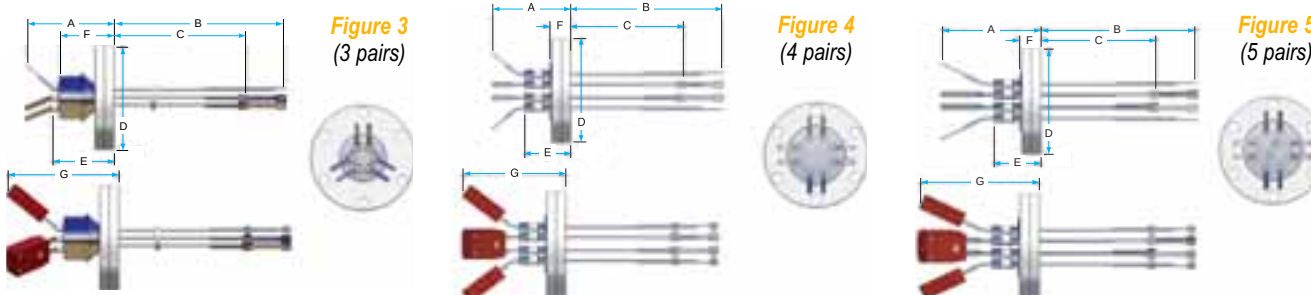
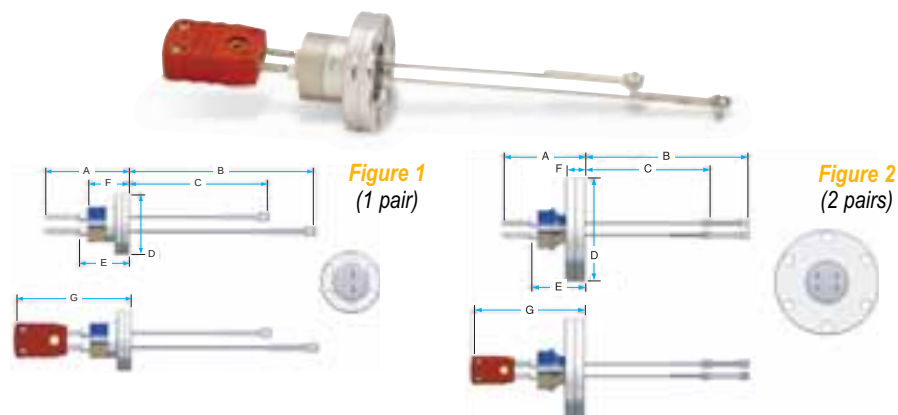


Figure	Air Side	Vac. Side	Flange Size	T/C Pairs	Dimensions (in.)							Part No.	Price
1	Miniature Plug	Nut/Bolt	1.33" CF	1	1.81	4.00	3.00	1.33	1.08	0.88	2.42	TFT1CY00002	Call
1	Miniature Plug	Nut/Bolt	2.75" CF	1	1.31	4.50	3.50	2.75	0.58	0.38	1.92	TFT1CY00003	Call
2	Miniature Plug	Nut/Bolt	1.33" CF	2	2.61	4.00	3.00	1.33	1.88	1.10	3.22	TFT2CY00002	Call
2	Miniature Plug	Nut/Bolt	2.75" CF	2	2.11	4.50	3.50	2.75	1.38	0.60	2.72	TFT2CY00003	Call
3	Miniature Plug	Nut/Bolt	1.33" CF	3	2.76	4.00	3.00	1.33	2.08	0.97	3.40	TFT3CY00002	Call
3	Miniature Plug	Nut/Bolt	2.75" CF	3	2.26	4.50	3.50	2.75	1.58	0.47	2.90	TFT3CY00003	Call
4	Miniature Plug	Nut/Bolt	2.75" CF	4	2.00	4.00	3.00	2.75	1.16	0.50	2.50	TFT4CY00003	Call
5	Miniature Plug	Nut/Bolt	2.75" CF	5	2.50	4.00	3.00	2.75	1.16	0.50	3.00	TFT5CY00003	Call

Refer to Connectors & Cabling, starting on page 3-113, for miniature connectors, t/c wire, and wire beads.

■ 1" Baseplate

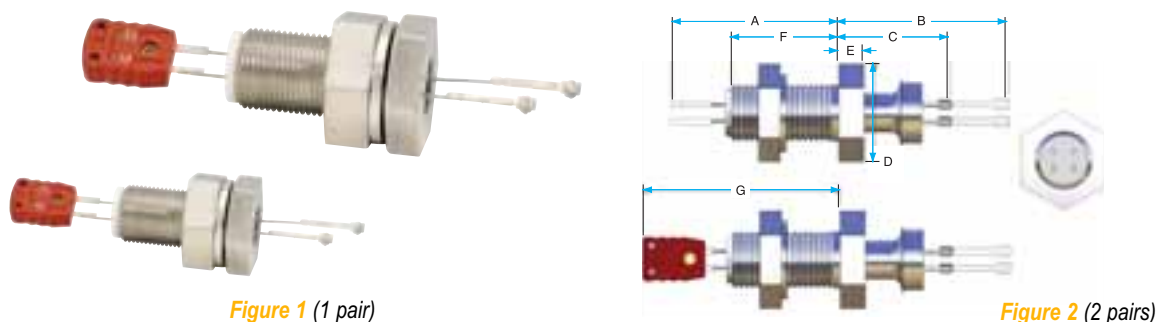


Figure	Air Side	Vac. Side	Mounting	T/C Pairs	Dimensions (in.)							Part No.	Price
1	Miniature Plug	Nut/Bolt	1" BP	1	2.88	2.44	1.94	1.50	0.44	1.88	3.81	TFT1CY00004	Call
2	Miniature Plug	Nut/Bolt	1" BP	2	2.93	2.98	2.98	1.50	0.44	1.88	3.40	TFT2CY00004	Call

Refer to Connectors & Cabling, starting on page 3-113, for miniature connectors, t/c wire, and wire beads.

► Type C Mini Plug

■ KF (QF) Flange

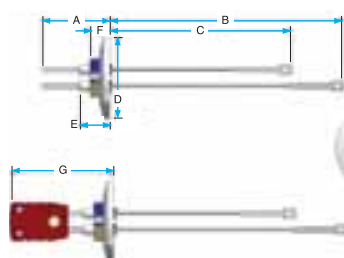


Figure 1 (1 pair)

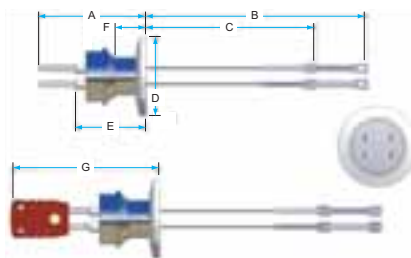


Figure 2 (2 pairs)

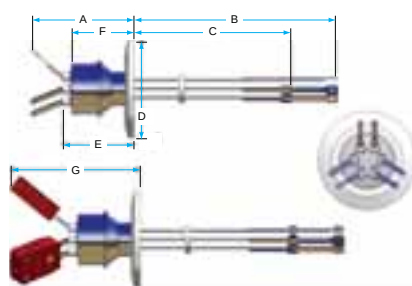


Figure 3 (3 pairs)

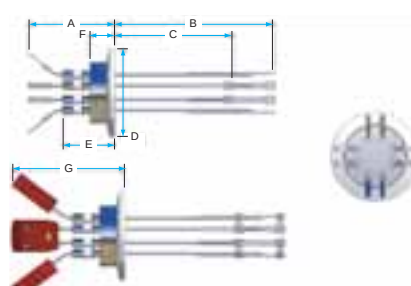


Figure 4 (4 pairs)

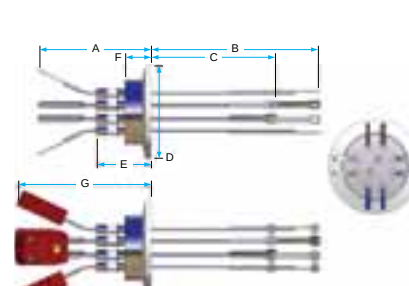


Figure 5 (5 pairs)

Figure	Air Side	Vac. Side	Flange Size	T/C Pairs	Dimensions (in.)							Part No.	Price
1	Miniature Plug	Nut/Bolt	KF16	1	1.31	4.50	3.50	1.18	0.58	0.38	1.92	TFT1CY00008	Call
1	Miniature Plug	Nut/Bolt	KF25	1	1.31	4.50	3.50	1.57	0.58	0.38	1.92	TFT1CY00008A	Call
1	Miniature Plug	Nut/Bolt	KF40	1	1.31	4.50	3.50	2.16	0.58	0.38	1.92	TFT1CY00008B	Call
2	Miniature Plug	Nut/Bolt	KF16	2	2.11	4.50	3.50	1.18	1.38	0.60	2.72	TFT2CY00008	Call
2	Miniature Plug	Nut/Bolt	KF25	2	2.11	4.50	3.50	1.57	1.38	0.60	2.72	TFT2CY00008A	Call
2	Miniature Plug	Nut/Bolt	KF40	2	2.11	4.50	3.50	2.16	1.38	0.60	2.72	TFT2CY00008B	Call
3	Miniature Plug	Nut/Bolt	KF16	3	2.26	4.50	3.50	1.18	1.58	0.47	2.90	TFT3CY00008	Call
3	Miniature Plug	Nut/Bolt	KF40	3	2.26	4.50	3.50	2.16	1.58	0.47	2.90	TFT3CY00008B	Call
3	Miniature Plug	Nut/Bolt	KF50	3	2.26	4.50	3.50	2.95	1.58	0.47	2.90	TFT3CY00008C	Call
4	Miniature Plug	Nut/Bolt	KF40	4	2.00	4.00	3.00	2.16	1.16	0.50	2.50	TFT4CY00008B	Call
5	Miniature Plug	Nut/Bolt	KF40	5	2.50	4.00	3.00	2.16	1.16	0.50	3.00	TFT5CY00008B	Call

Refer to Connectors & Cabling, starting on page 3-113, for miniature connectors, t/c wire, and wire beads.

■ NPT(M) Terminations

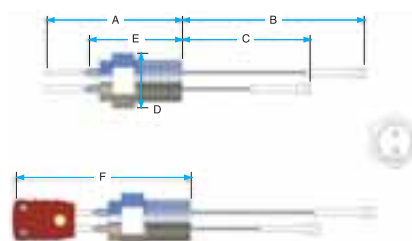


Figure 1 (1 pair)



Figure 2 (2 pairs)

Figure	Air Side	Vac. Side	Mounting	T/C Pairs	Dimensions (in.)						Part No.	Price
1	Miniature Plug	Nut/Bolt	1/2" NPT	1	2.50	3.35	2.35	0.875	1.72	3.06	TFT1CY00005	Call
2	Miniature Plug	Nut/Bolt	1/2" NPT	2	3.29	3.35	2.35	0.875	2.51	3.84	TFT2CY00005	Call

Refer to Connectors & Cabling, starting on page 3-113, for miniature connectors, t/c wire, and wire beads.

➤ Type C Mini Plug Plus Power

3

Feedthroughs

In This Subsection ➤

Type C Mini Plug Plus Power

- Nickel or copper
- Rated to 5,000 volts and 30 amps
- Designed for use in high vacuum and UHV applications requiring both power and temperature measurements
- Minimize the number of dedicated vacuum ports ultimately required in a vacuum system
- Feature positive wires made of Tungsten/5% Rhenium and negative wires of Tungsten/26% Rhenium
- Temperature range between 0° C and 2,320° C
- Can be used with refractory-metal thermocouples
- Rated for use in high vacuum and UHV applications
- All assemblies are supplied with miniature air-side thermocouple connectors and vacuum-side thermocouple lugs with a #3–48 screw and nut

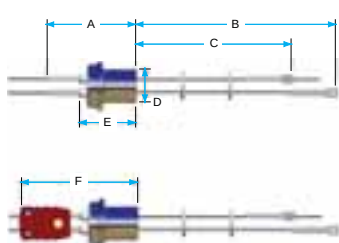


Figure 1 (Weldable, 1 pair)

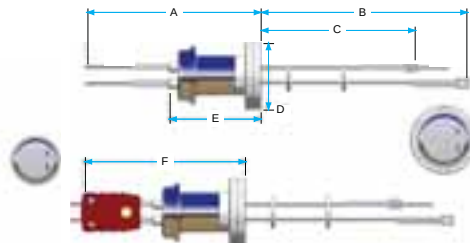


Figure 2 (CF Flange, 1 pair)

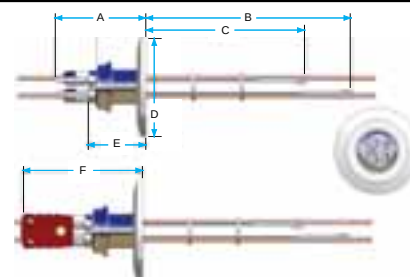


Figure 3 (KF Flange, 1 pair)

■ Weldable

NOTE: Power leads are not supplied with connectors. Must be purchased separately.

Figure	Air Side	Vac. Side	T/C Pairs	Power Pins	Amps/Pin	Dimensions (in.)						Part No.	Price
						A	B	C	D	E	F		
1	Miniature Plug	Nut/Bolt	1	(2) .050" Cu	15	2.00	4.50	3.5	0.747	1.27	2.37	TFT1CY2C151	Call
1	Miniature Plug	Nut/Bolt	1	(2) .094" Cu	30	2.35	4.36	3.36	0.747	1.36	2.72	TFT1CY2C301	Call
1	Miniature Plug	Nut/Bolt	1	(2) .050" Ni	5	2.00	4.50	3.50	0.747	1.27	2.37	TFT1CY2N051	Call
1	Miniature Plug	Nut/Bolt	1	(2) .094" Ni	15	2.35	4.36	3.36	0.747	1.36	2.72	TFT1CY2N151	Call

Refer to Connectors & Cabling, starting on page 3-113, for miniature connectors, t/c wire, wire beads, inline barrel connectors, set screw connectors, crimp/solder connectors, and bare wire.

■ CF Flange

Figure	Air Side	Vac. Side	Flange Size	T/C Pairs	Power Pins	Amps/Pin	Dimensions (in.)						Part No.	Price
							A	B	C	D	E	F		
2	Miniature Plug	Nut/Bolt	1.33" CF	1	(2) .050" Cu	15	2.50	4.00	3.00	1.33	1.77	2.87	TFT1CY2C152	Call
2	Miniature Plug	Nut/Bolt	2.75" CF	1	(2) .050" Cu	15	2.00	4.50	3.50	2.75	1.27	2.37	TFT1CY2C153	Call
2	Miniature Plug	Nut/Bolt	1.33" CF	1	(2) .094" Cu	30	2.85	3.86	2.86	1.33	1.86	3.22	TFT1CY2C302	Call
2	Miniature Plug	Nut/Bolt	2.75" CF	1	(2) .094" Cu	30	2.35	4.36	3.36	2.75	1.36	2.72	TFT1CY2C303	Call
2	Miniature Plug	Nut/Bolt	1.33" CF	1	(2) .050" Ni	5	2.50	4.00	3.00	1.33	1.77	2.87	TFT1CY2N052	Call
2	Miniature Plug	Nut/Bolt	2.75" CF	1	(2) .050" Ni	5	2.00	4.50	3.50	2.75	1.27	2.37	TFT1CY2N053	Call
2	Miniature Plug	Nut/Bolt	1.33" CF	1	(2) .094" Ni	15	2.85	3.86	2.86	1.33	1.86	3.22	TFT1CY2N152	Call
2	Miniature Plug	Nut/Bolt	2.75" CF	1	(2) .094" Ni	15	2.35	4.36	3.36	2.75	1.36	2.72	TFT1CY2N153	Call

Refer to Connectors & Cabling, starting on page 3-113, for miniature connectors, t/c wire, wire beads, inline barrel connectors, set screw connectors, crimp/solder connectors, and bare wire.

■ KF (QF) Flange

Figure	Air Side	Vac. Side	Flange Size	T/C Pairs	Power Pins	Amps/Pin	Dimensions (in.)						Part No.	Price
							A	B	C	D	E	F		
3	Miniature Plug	Nut/Bolt	KF16	1	(2) .050" Cu	15	2.00	4.50	3.50	1.18	1.27	2.37	TFT1CY2C158	Call
3	Miniature Plug	Nut/Bolt	KF40	1	(2) .050" Cu	15	2.00	4.50	3.50	2.16	1.27	2.37	TFT1CY2C158B	Call
3	Miniature Plug	Nut/Bolt	KF16	1	(2) .094" Cu	30	2.35	4.36	3.36	1.18	1.36	2.72	TFT1CY2C308	Call
3	Miniature Plug	Nut/Bolt	KF40	1	(2) .094" Cu	30	2.35	4.36	3.36	2.16	1.36	2.72	TFT1CY2C308B	Call
3	Miniature Plug	Nut/Bolt	KF16	1	(2) .050" Ni	5	2.00	4.50	3.50	1.18	1.27	2.37	TFT1CY2N058	Call
3	Miniature Plug	Nut/Bolt	KF40	1	(2) .050" Ni	5	2.00	4.50	3.50	2.16	1.27	2.37	TFT1CY2N058B	Call
3	Miniature Plug	Nut/Bolt	KF16	1	(2) .094" Ni	15	2.35	4.36	3.36	1.18	1.36	2.72	TFT1CY2N158	Call
3	Miniature Plug	Nut/Bolt	KF40	1	(2) .094" Ni	15	2.35	4.36	3.36	2.16	1.36	2.72	TFT1CY2N158B	Call

Refer to Connectors & Cabling, starting on page 3-113, for miniature connectors, t/c wire, wire beads, inline barrel connectors, set screw connectors, crimp/solder connectors, and bare wire.

➤ Type E Mini Plug

■ Weldable, Single-Ended

- Available in 1, 2, 3, 4, and 5 pairs
- Temperature range of -200° C to 900° C
- Positive wires are made of Chromel® and the negative wires are made of Constantan

3 Feedthroughs

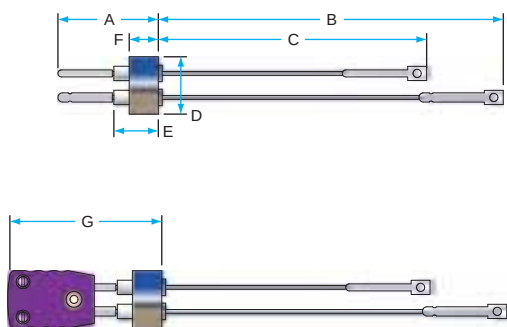


Figure 1 (1 pair)

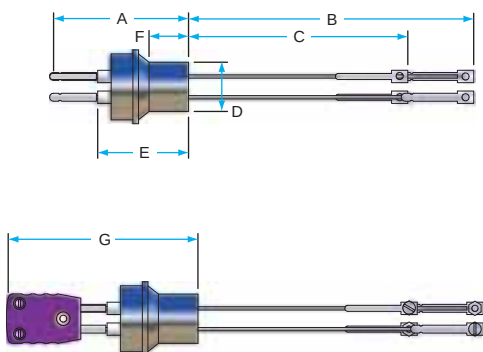


Figure 2 (2 pairs)

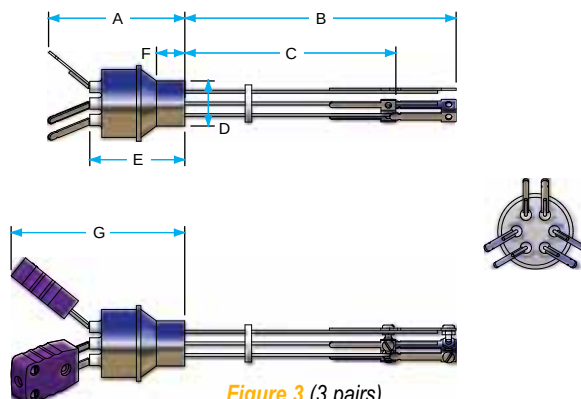


Figure 3 (3 pairs)

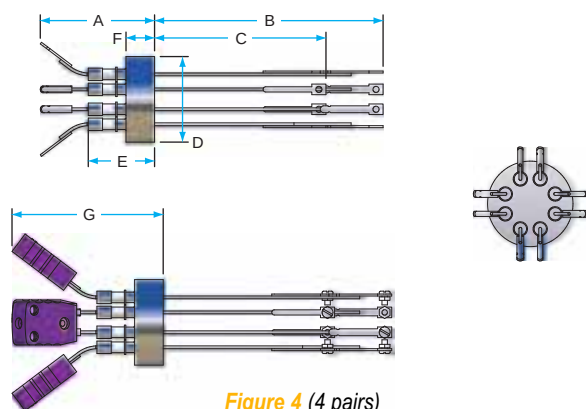


Figure 4 (4 pairs)

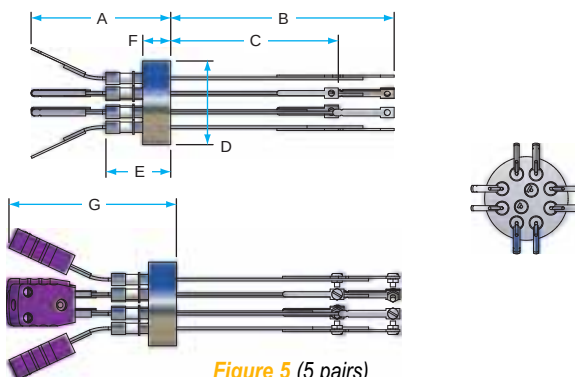


Figure 5 (5 pairs)

Figure	Air Side	Vac. Side	T/C Pairs	Dimensions (in.)							Part No.	Price
1	Miniature Plug	Nut/Bolt	1	A	B	C	D	E	F	G	TFT1EY00001	Call
2	Miniature Plug	Nut/Bolt	2	2.11	4.50	3.50	0.747	1.38	0.60	2.72	TFT2EY00001	Call
3	Miniature Plug	Nut/Bolt	3	2.26	4.50	3.50	0.747	1.58	0.47	2.90	TFT3EY00001	Call
4	Miniature Plug	Nut/Bolt	4	2.00	4.00	3.00	1.495	1.16	0.50	2.50	TFT4EY00001	Call
5	Miniature Plug	Nut/Bolt	5	2.50	4.00	3.00	1.495	1.16	0.50	3.00	TFT5EY00001	Call

Refer to Connectors & Cabling, starting on page 3-113, for miniature connectors, t/c wire, and wire beads.

► Type E Mini Plug

■ CF Flange, Single-Ended

- Available in 1, 2, 3, 4, and 5 pairs
- Positive wires are made of Chromel® and the negative wires are made of Constantan
- Temperature range of -200° C to +900° C

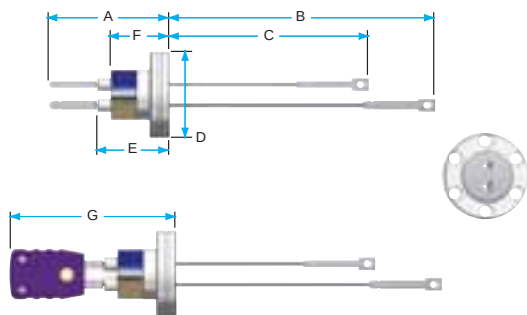


Figure 1 (1 pair)

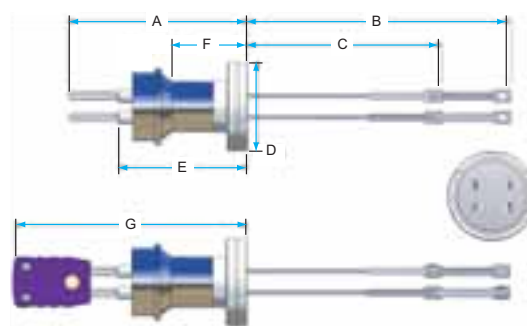


Figure 2 (2 pairs)

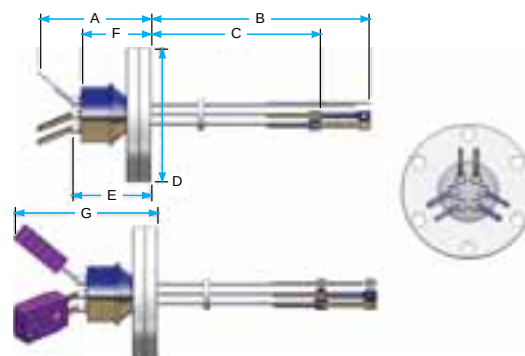


Figure 3 (3 pairs)

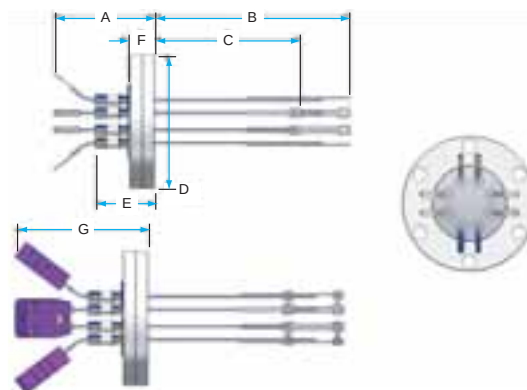


Figure 4 (4 pairs)

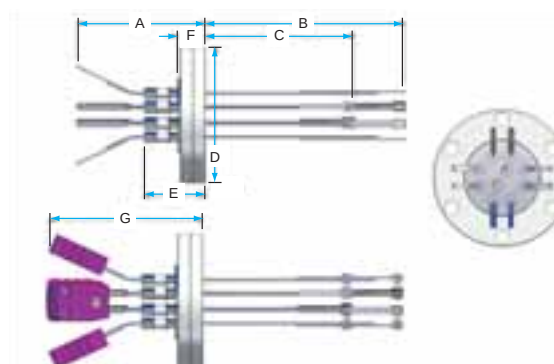


Figure 5 (5 pairs)

Figure	Air Side	Vac. Side	Flange Size	T/C Pairs	Dimensions (in.)								Part No.	Price
1	Miniature Plug	Nut/Bolt	1.33" CF	1	1.81	4.00	3.00	1.33	1.08	0.88	2.42		TFT1EY00002	Call
1	Miniature Plug	Nut/Bolt	2.75" CF	1	1.31	4.50	3.50	2.75	0.58	0.38	1.92		TFT1EY00003	Call
2	Miniature Plug	Nut/Bolt	1.33" CF	2	2.61	4.00	3.00	1.33	1.88	1.10	3.22		TFT2EY00002	Call
2	Miniature Plug	Nut/Bolt	2.75" CF	2	2.11	4.50	3.50	2.75	1.38	0.60	2.72		TFT2EY00003	Call
3	Miniature Plug	Nut/Bolt	1.33" CF	3	2.76	4.00	3.00	1.33	2.08	0.97	3.40		TFT3EY00002	Call
3	Miniature Plug	Nut/Bolt	2.75" CF	3	2.26	4.50	3.50	2.75	1.58	0.47	2.90		TFT3EY00003	Call
4	Miniature Plug	Nut/Bolt	2.75" CF	4	2.00	4.00	3.00	2.75	1.16	0.50	2.50		TFT4EY00003	Call
5	Miniature Plug	Nut/Bolt	2.75" CF	5	2.50	4.00	3.00	2.75	1.16	0.50	3.00		TFT5EY00003	Call

Refer to Connectors & Cabling, starting on page 3-113, for miniature connectors, t/c wire, and wire beads.

➤ Type E Mini Plug

■ KF (QF) Flange, Single-Ended

- Available in 1, 2, 3, 4, and 5 pairs
- Positive wires are made of Chromel® and the negative wires are made of Constantan
- Temperature range of -200° C to +900° C

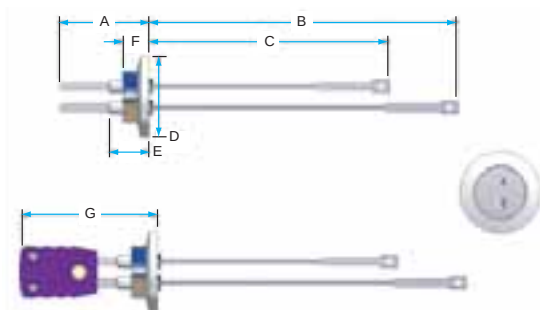


Figure 1 (1 pair)

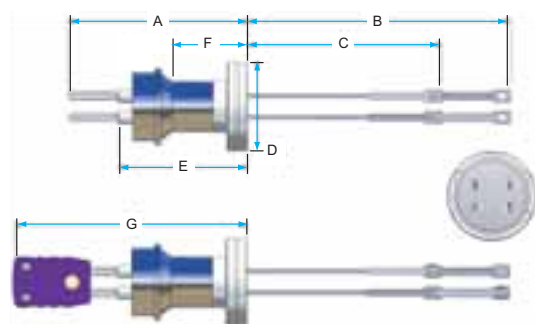


Figure 2 (2 pairs)

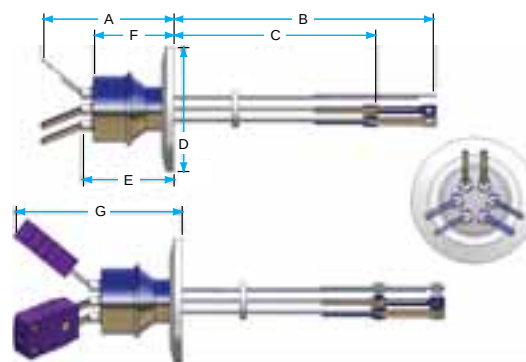


Figure 3 (3 pairs)

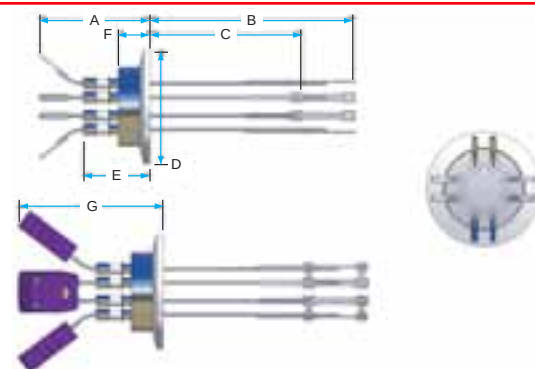


Figure 4 (4 pairs)

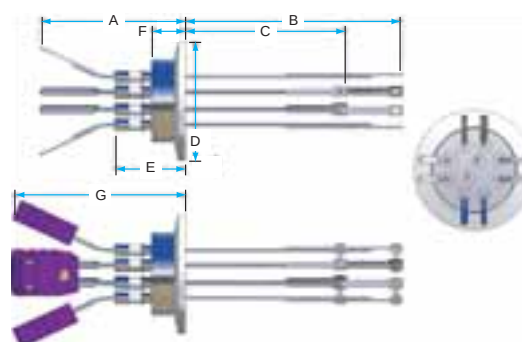


Figure 5 (5 pairs)

Figure	Air Side	Vac. Side	Flange Size	T/C Pairs	Dimensions (in.)							Part No.	Price
1	Miniature Plug	Nut/Bolt	KF16	1	1.31	4.50	3.50	1.18	0.58	0.38	1.92	TFT1EY00008	Call
1	Miniature Plug	Nut/Bolt	KF40	1	1.31	4.50	3.50	2.16	0.58	0.38	1.92	TFT1EY00008B	Call
2	Miniature Plug	Nut/Bolt	KF16	2	2.11	4.50	3.50	1.18	1.38	0.60	2.72	TFT2EY00008	Call
2	Miniature Plug	Nut/Bolt	KF40	2	2.11	4.50	3.50	2.16	1.38	0.60	2.72	TFT2EY00008B	Call
3	Miniature Plug	Nut/Bolt	KF16	3	2.26	4.50	3.50	1.18	1.58	0.47	2.90	TFT3EY00008	Call
3	Miniature Plug	Nut/Bolt	KF40	3	2.26	4.50	3.50	2.16	1.58	0.47	2.90	TFT3EY00008B	Call
4	Miniature Plug	Nut/Bolt	KF40	4	2.00	4.00	3.00	2.16	1.16	0.50	2.50	TFT4EY00008B	Call
5	Miniature Plug	Nut/Bolt	KF40	5	2.50	4.00	3.00	2.16	1.16	0.50	3.00	TFT5EY00008B	Call

Refer to Connectors & Cabling, starting on page 3-113, for miniature connectors, t/c wire, and wire beads.

► Type E Mini Plug

■ 1" Baseplate, Single-Ended

- Available in 1 or 2 pairs
- Positive wires are made of Chromel® and the negative wires are made of Constantan
- Temperature range of -200° C to +900° C

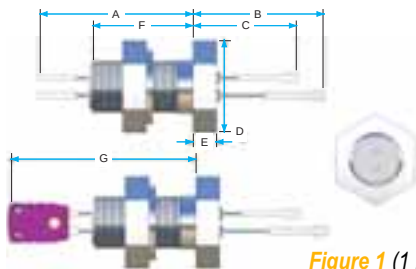


Figure 1 (1 pair)

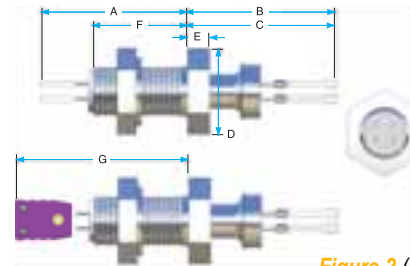


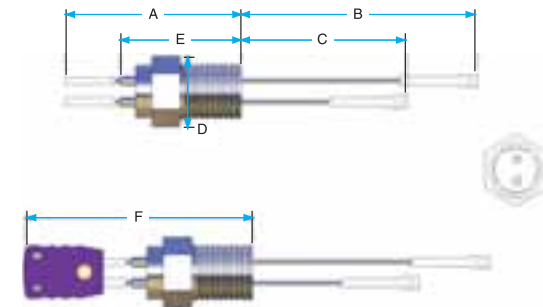
Figure 2 (2 pairs)

Figure	Air Side	Vac. Side	Mounting	T/C Pairs	A	B	C	D	E	F	G	Part No.	Price
1	Miniature Plug	Nut/Bolt	1" BP	1	2.88	2.44	1.94	1.50	0.44	1.88	3.81	TFT1EY00004	Call
2	Miniature Plug	Nut/Bolt	1" BP	2	2.93	2.98	2.98	1.50	0.44	1.88	3.40	TFT2EY00004	Call

Refer to Connectors & Cabling, starting on page 3-113, for miniature connectors, t/c wire, and wire beads.

■ NPT (M), Single-Ended

- Available in 1 pair
- Positive wires are made of Chromel® and the negative wires are made of Constantan
- Temperature range of -200° C to +900° C



Air Side	Vac. Side	Mounting	T/C Pairs	A	B	C	D	E	F	Part No.	Price
Miniature Plug	Nut/Bolt	1/2" NPT	1	2.50	3.35	2.35	0.875	1.72	3.06	TFT1EY00005	Call

Refer to Connectors & Cabling, starting on page 3-113, for miniature connectors, t/c wire, and wire beads.



1985

Artificial Heart

Dr. Barney Clark was the first person to receive a successful artificial heart implantation. The heart was named the Jarvik 7 and it kept Dr. Clark alive for 112 days.

Kurt J. Lesker Company introduced our first bound Vacuum Products Catalog. A 400-page black and white book featuring the Lesker Line of Hydrocarbon fluids, Fomblin®, and Dow Corning® oils and greases.

➤ Type E Mil-Spec Plug

■ Weldable, Single-Ended

IN THIS SECTION ➤

Type E T/C Screw-On

- Multi-pin screw-on connectors
- Available in 2, 3, 5, and 10 pairs
- Positive wires are made of Chromel® and the negative wires are made of Constantan
- Temperature range of -200° C to +900° C

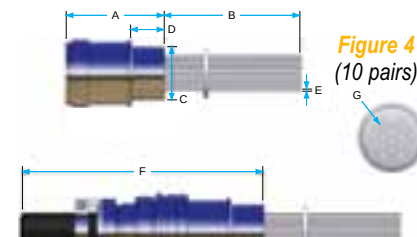
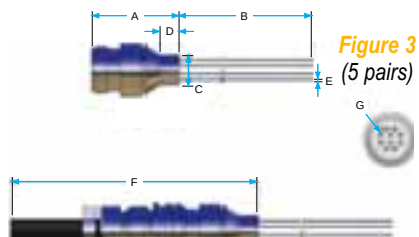
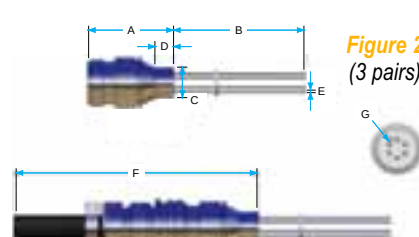
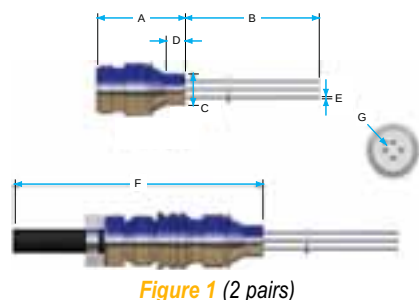


Figure	Air Side	Vac. Side	T/C Pairs	Dimensions (in.)							Part No.	Price
1	Mil-Spec Plug	Pins	2	A	B	C	D	E	F	G	TFT2EA00001	Call
2	Mil-Spec Plug	Pins	3	2.35	3.20	0.747	0.46	0.056	4.03	0.38	TFT3EA00001	Call
3	Mil-Spec Plug	Pins	5	2.35	3.20	0.747	0.46	0.056	4.03	0.51	TFT5EA00001	Call
4	Mil-Spec Plug	Pins	10	2.53	3.50	1.372	0.76	0.056	4.78	1.03	TFTVEA00001	Call

Refer to Connectors & Cabling, starting on page 3-113, for mil-spec connectors, crimp/solder connectors, t/c wire, wire beads, and ceramic wire discs.

■ CF Flange, Single-Ended

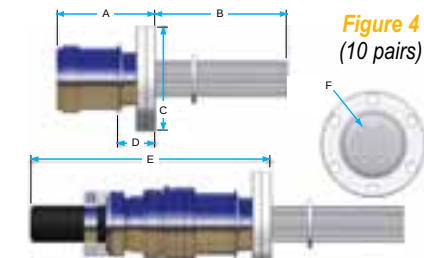
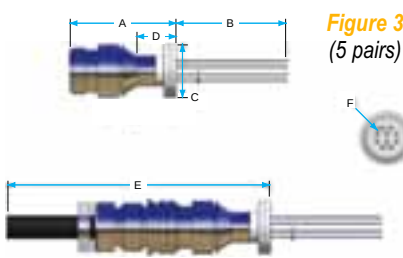
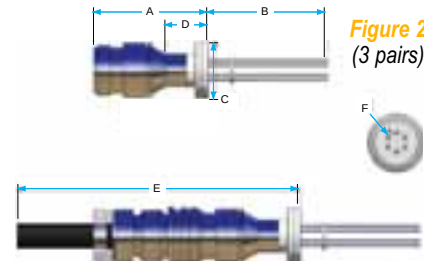
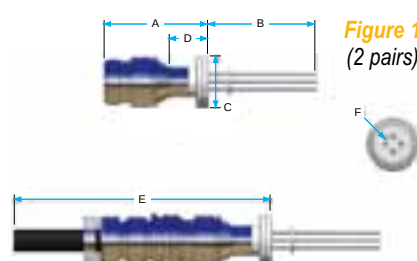


Figure	Air Side	Vac. Side	Flange Size	T/C Pairs	Dimensions (in.)						Part No.	Price
					A	B	C	D	E	F		
1	Mil-Spec Plug	Pins	1.33" CF	2	2.85	2.70	1.33	0.96	4.53	0.38	TFT2EA00002	Call
1	Mil-Spec Plug	Pins	2.75" CF	2	2.35	3.20	2.75	0.46	4.03	0.38	TFT2EA00003	Call
2	Mil-Spec Plug	Pins	1.33" CF	3	2.85	2.70	1.33	0.96	4.53	0.44	TFT3EA00002	Call
2	Mil-Spec Plug	Pins	2.75" CF	3	2.35	3.20	2.75	0.46	4.03	0.44	TFT3EA00003	Call
3	Mil-Spec Plug	Pins	1.33" CF	5	2.85	2.70	1.33	0.96	4.53	0.51	TFT5EA00002	Call
3	Mil-Spec Plug	Pins	2.75" CF	5	2.35	3.20	2.75	0.46	4.03	0.51	TFT5EA00003	Call
4	Mil-Spec Plug	Pins	2.75" CF	10	2.53	3.50	2.75	0.76	4.78	1.03	TFTVEA00003	Call

Refer to Connectors & Cabling, starting on page 3-113, for mil-spec connectors, crimp/solder connectors, t/c wire, wire beads, and ceramic wire discs.

➤ Type E Mil-Spec Plug

■ KF (QF) Flange, Single-Ended

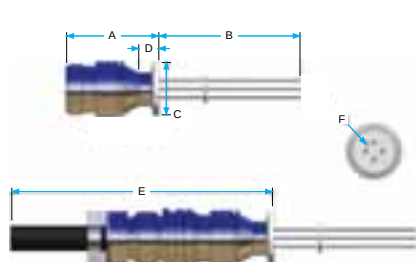


Figure 1 (2 pairs)

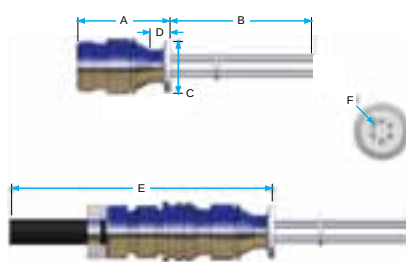


Figure 2 (3 pairs)

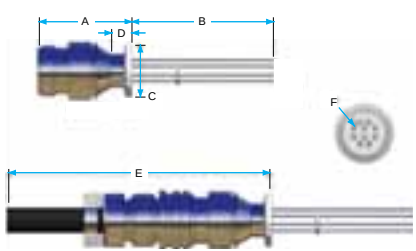


Figure 3 (5 pairs)

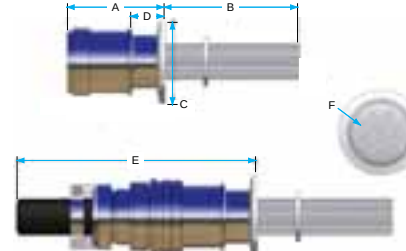


Figure 4 (10 pairs)

Figure	Air Side	Vac. Side	Flange Size	T/C Pairs	Dimensions (in.)						Part No.	Price
					A	B	C	D	E	F		
1	Mil-Spec Plug	Pins	KF16	2	2.35	3.20	1.18	0.46	4.03	0.38	TFT2EA00008	Call
1	Mil-Spec Plug	Pins	KF40	2	2.35	3.20	2.16	0.46	4.03	0.38	TFT2EA00008B	Call
2	Mil-Spec Plug	Pins	KF16	3	2.35	3.20	1.18	0.46	4.03	0.44	TFT3EA00008	Call
2	Mil-Spec Plug	Pins	KF40	3	2.35	3.20	2.16	0.46	4.03	0.44	TFT3EA00008B	Call
3	Mil-Spec Plug	Pins	KF16	5	2.35	3.20	1.18	0.46	4.03	0.51	TFT5EA00008	Call
3	Mil-Spec Plug	Pins	KF40	5	2.35	3.20	2.16	0.46	4.03	0.51	TFT5EA00008B	Call
4	Mil-Spec Plug	Pins	KF40	10	2.53	3.50	2.16	0.76	4.78	1.03	TFTVEA00008B	Call

Refer to Connectors & Cabling, starting on page 3-113, for mil-spec connectors, crimp/solder connectors, t/c wire, wire beads, and ceramic wire discs.

■ (M)NPT Terminations, Single-Ended

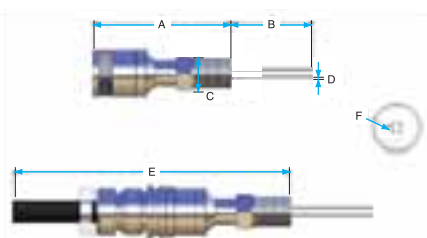


Figure 1 (2 pairs)

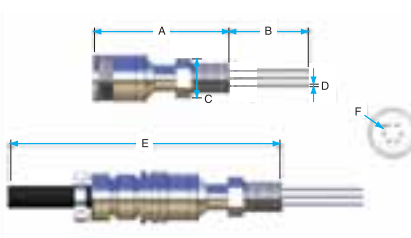


Figure 2 (3 pairs)

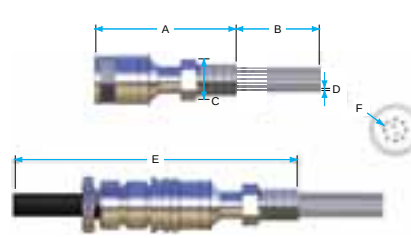


Figure 3 (5 pairs)

Figure	Air Side	Vac. Side	Mounting	T/C Pairs	Dimensions (in.)						Part No.	Price
					A	B	C	D	E	F		
1	Mil-Spec Plug	Pins	1/2" NPT	2	3.49	2.06	0.87	0.056	5.32	0.38	TFT2EA00005	Call
2	Mil-Spec Plug	Pins	1/2" NPT	3	3.49	2.06	0.87	0.056	5.32	0.44	TFT3EA00005	Call
3	Mil-Spec Plug	Pins	1/2" NPT	5	3.49	2.06	0.87	0.056	5.32	0.51	TFT5EA00005	Call

Refer to Connectors & Cabling, starting on page 3-113, for mil-spec connectors, crimp/solder connectors, t/c wire, wire beads, and ceramic wire discs.

➤ Type E Mini Plug Plus Power

IN THIS SECTION ➤

Type E T/C Plus Power

Type E Thermocouple/Power Feedthroughs:

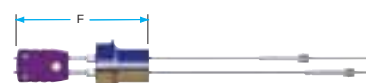
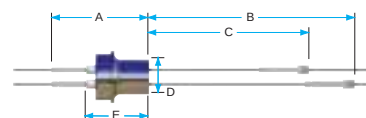
- Two nickel or copper power conductors
- Rated to 5,000 volts and 30 amps
- Use in high vacuum and UHV applications requiring both power and temperature measurements
- Minimizes the number of dedicated vacuum ports required in vacuum systems

Type E Feedthroughs:

- Constructed of vacuum-grade materials, including OFHC copper or nickel conductor pins, high-purity alumina ceramic insulation, 304 stainless steel mounts, and vacuum-tube-grade braze alloys
- Positive wires made of Chromel® and negative wires made of Constantan
- Temperature range of -200° C to +900° C
- Assemblies supplied with miniature air-side thermocouple connectors and vacuum-side thermocouple lugs with a #3-48 screw and nut

NOTE: Power leads are not supplied with connectors. Must be purchased separately.

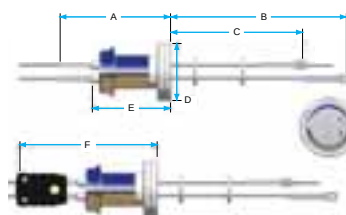
■ Weldable, Single-Ended



Air Side	Vac. Side	T/C Pairs	Power Pins	Amps/Pin	Dimensions (in.)						Part No.	Price
					A	B	C	D	E	F		
Miniature Plug	Nut/Bolt	1	(2) 0.050" Cu	15	2.14	4.50	3.50	0.747	1.36	2.72	TFT1EY2C151	Call
Miniature Plug	Nut/Bolt	1	(2) 0.094" Cu	30	2.35	4.50	3.50	0.747	1.77	2.95	TFT1EY2C301	Call
Miniature Plug	Nut/Bolt	1	(2) 0.050" Ni	5	2.14	4.50	3.50	0.747	1.36	2.72	TFT1EY2N051	Call
Miniature Plug	Nut/Bolt	1	(2) 0.092" Ni	15	2.35	4.50	3.50	0.747	1.77	2.95	TFT1EY2N151	Call

Refer to Connectors & Cabling, starting on page 3-113, for miniature connectors, t/c wire, wire beads, inline barrel connectors, set screw connectors, crimp/solder connectors, and bare wire.

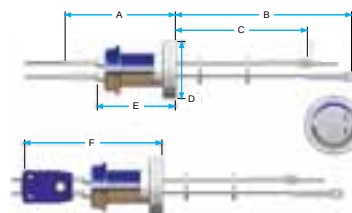
■ CF Flange, Single-Ended



Air Side	Vac. Side	Flange Size	T/C Pairs	Power Pins	Amps/Pin	Dimensions (in.)						Part No.	Price
						A	B	C	D	E	F		
Miniature Plug	Nut/Bolt	1.33" CF	1	(2) 0.050" Cu	15	2.64	4.00	3.00	1.33	1.86	3.22	TFT1EY2C152	Call
Miniature Plug	Nut/Bolt	2.75" CF	1	(2) 0.050" Cu	15	2.14	4.50	3.50	2.75	1.36	2.72	TFT1EY2C153	Call
Miniature Plug	Nut/Bolt	1.33" CF	1	(2) 0.094" Cu	30	2.85	4.00	3.00	1.33	2.27	3.45	TFT1EY2C302	Call
Miniature Plug	Nut/Bolt	2.75" CF	1	(2) 0.094" Cu	30	2.35	4.50	3.50	2.75	1.77	2.95	TFT1EY2C303	Call
Miniature Plug	Nut/Bolt	1.33" CF	1	(2) 0.050" Ni	5	2.64	4.00	3.00	1.33	1.86	3.22	TFT1EY2N052	Call
Miniature Plug	Nut/Bolt	2.75" CF	1	(2) 0.050" Ni	5	2.14	4.50	3.50	2.75	1.36	2.72	TFT1EY2N053	Call
Miniature Plug	Nut/Bolt	1.33" CF	1	(2) 0.092" Ni	15	2.85	4.00	3.00	1.33	2.27	3.45	TFT1EY2N152	Call
Miniature Plug	Nut/Bolt	2.75" CF	1	(2) 0.092" Ni	15	2.35	4.50	3.50	2.75	1.77	2.95	TFT1EY2N153	Call

Refer to Connectors & Cabling, starting on page 3-113, for miniature connectors, t/c wire, wire beads, inline barrel connectors, set screw connectors, crimp/solder connectors, and bare wire.

■ KF (QF) Flange, Single-Ended



Air Side	Vac. Side	Flange Size	T/C Pairs	Power Pins	Amps/Pin	Dimensions (in.)						Part No.	Price
						A	B	C	D	E	F		
Miniature Plug	Nut/Bolt	KF16	1	(2) 0.050" Cu	15	2.14	4.50	3.50	1.18	1.36	2.72	TFT1EY2C158	Call
Miniature Plug	Nut/Bolt	KF40	1	(2) 0.050" Cu	15	2.14	4.50	3.50	2.16	1.36	2.72	TFT1EY2C158B	Call
Miniature Plug	Nut/Bolt	KF16	1	(2) 0.094" Cu	30	2.35	4.36	3.36	1.18	1.77	2.95	TFT1EY2C308	Call
Miniature Plug	Nut/Bolt	KF40	1	(2) 0.094" Cu	30	2.35	4.36	3.36	2.16	1.77	2.95	TFT1EY2C308B	Call
Miniature Plug	Nut/Bolt	KF16	1	(2) 0.050" Ni	5	2.14	4.50	3.50	1.18	1.36	2.72	TFT1EY2N058	Call
Miniature Plug	Nut/Bolt	KF40	1	(2) 0.050" Ni	5	2.14	4.50	3.50	2.16	1.36	2.72	TFT1EY2N058B	Call
Miniature Plug	Nut/Bolt	KF16	1	(2) 0.092" Ni	15	2.35	4.36	3.36	1.18	1.77	2.95	TFT1EY2N158	Call
Miniature Plug	Nut/Bolt	KF40	1	(2) 0.092" Ni	15	2.35	4.36	3.36	2.16	1.77	2.95	TFT1EY2N158B	Call

Refer to Connectors & Cabling, starting on page 3-113, for miniature connectors, t/c wire, wire beads, inline barrel connectors, set screw connectors, crimp/solder connectors, and bare wire.

➤ Type E Push-On

IN THIS SECTION ➤

Type E T/C Push-On

- Individual push-on connectors
- Available in 2, 3, or 5 pairs
- Positive wires are made of Chromel® and the negative wires are made of Constantan
- Temperature range of -200° C to +900° C

■ Weldable, Single-Ended

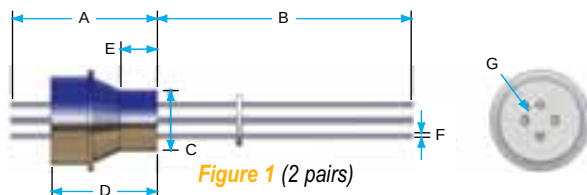


Figure 1 (2 pairs)

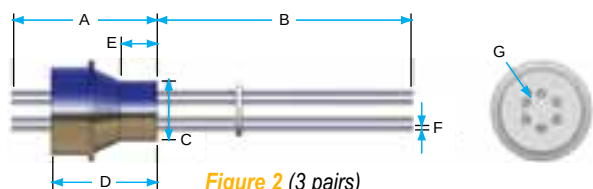


Figure 2 (3 pairs)

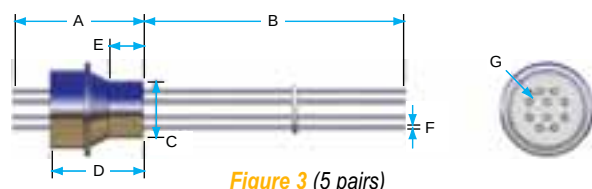


Figure 3 (5 pairs)

Figure	Air Side	Vac. Side	T/C Pairs	Dimensions (in.)							Part No.	Price
1	Pins	Pins	2	A	B	C	D	E	F	G	TFT2EP00001	Call
2	Pins	Pins	3	2.05	3.20	0.747	1.43	0.46	0.056	0.44	TFT3EP00001	Call
3	Pins	Pins	5	2.05	3.20	0.747	1.43	0.46	0.056	0.51	TFT5EP00001	Call

Refer to Connectors & Cabling, starting on page 3-113, for crimp/solder connectors, t/c wire, wire beads, and ceramic wire discs.

■ CF Flange, Single-Ended

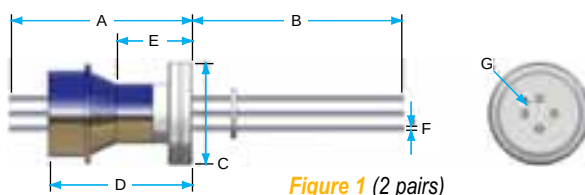


Figure 1 (2 pairs)

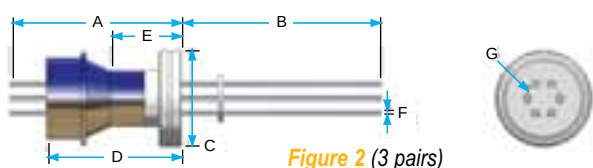


Figure 2 (3 pairs)

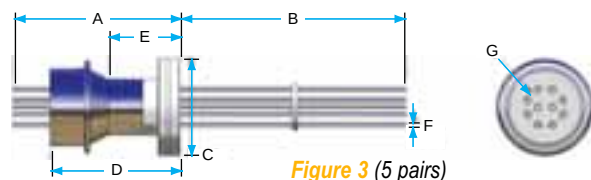


Figure 3 (5 pairs)

Figure	Air Side	Vac. Side	Flange Size	T/C Pairs	Dimensions (in.)							Part No.	Price
1	Pins	Pins	1.33" CF	2	A	B	C	D	E	F	G	TFT2EP00002	Call
1	Pins	Pins	2.75" CF	2	2.05	3.20	2.75	1.43	0.46	0.056	0.38	TFT2EP00003	Call
2	Pins	Pins	1.33" CF	3	2.55	2.70	1.33	1.93	0.96	0.056	0.44	TFT3EP00002	Call
2	Pins	Pins	2.75" CF	3	2.05	3.20	2.75	1.43	0.46	0.056	0.44	TFT3EP00003	Call
3	Pins	Pins	1.33" CF	5	2.55	2.70	1.33	1.93	0.96	0.056	0.51	TFT5EP00002	Call
3	Pins	Pins	2.75" CF	5	2.05	3.20	2.75	1.43	0.46	0.056	0.51	TFT5EP00003	Call

Refer to Connectors & Cabling, starting on page 3-113, for crimp/solder connectors, t/c wire, wire beads, and ceramic wire discs.

➤ Type E Push-On

■ KF (QF) Flange, Single-Ended

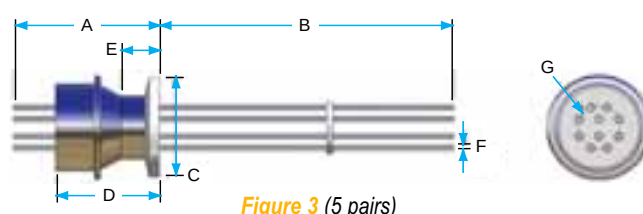
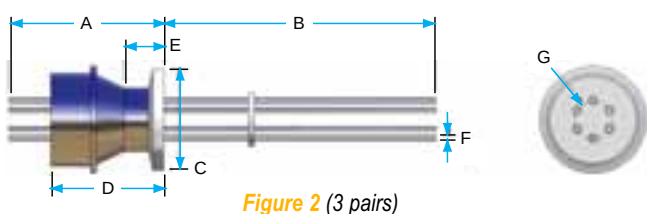
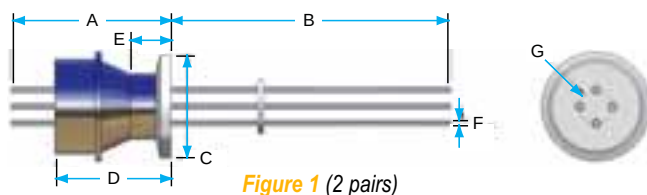


Figure	Air Side	Vac. Side	Flange Size	T/C Pairs	Dimensions (in.)							Part No.	Price
1	Pins	Pins	KF16	2	2.05	3.20	1.18	1.43	0.46	0.056	0.38	TFT2EP00008	Call
1	Pins	Pins	KF40	2	2.05	3.20	2.16	1.43	0.46	0.056	0.38	TFT2EP00008B	Call
2	Pins	Pins	KF16	3	2.05	3.20	1.18	1.43	0.46	0.056	0.44	TFT3EP00008	Call
2	Pins	Pins	KF40	3	2.05	3.20	2.16	1.43	0.46	0.056	0.44	TFT3EP00008B	Call
3	Pins	Pins	KF16	5	2.05	3.20	1.18	1.43	0.46	0.056	0.51	TFT5EP00008	Call
3	Pins	Pins	KF40	5	2.05	3.20	2.16	1.43	0.46	0.056	0.51	TFT5EP00008B	Call

Refer to Connectors & Cabling, starting on page 3-113, for crimp/solder connectors, t/c wire, wire beads, and ceramic wire discs.

■ NPT(M), Single-Ended

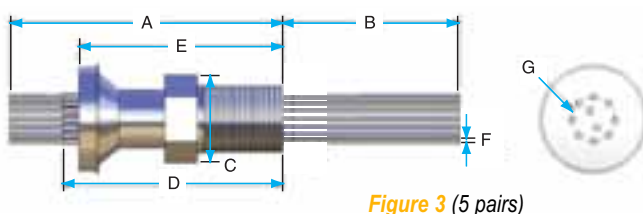
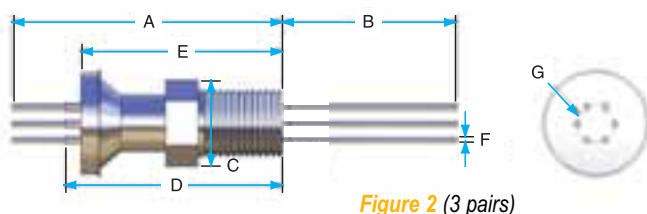
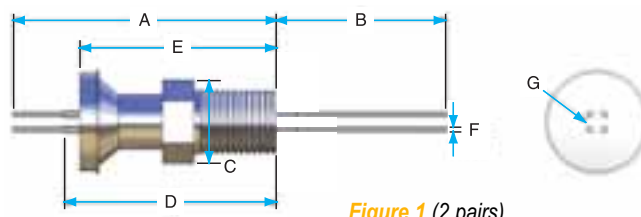


Figure	Air Side	Vac. Side	Mounting	T/C Pairs	Dimensions (in.)							Part No.	Price
1	Pins	Pins	1/2" NPT	2	3.19	2.06	0.87	2.57	2.38	0.056	0.38	TFT2EP00005	Call
2	Pins	Pins	1/2" NPT	3	3.19	2.06	0.87	2.57	2.38	0.056	0.44	TFT3EP00005	Call
3	Pins	Pins	1/2" NPT	5	3.19	2.06	0.87	2.57	2.38	0.056	0.51	TFT5EP00005	Call

Refer to Connectors & Cabling, starting on page 3-113, for crimp/solder connectors, t/c wire, wire beads, and ceramic wire discs.

➤ Type E Mil-Spec Plug

IN THIS SECTION ➤ Type E T/C Screw-On

- Individual screw-on connectors
- Available in 2, 3, 5, or 10 pairs
- Positive wires are made of Chromel® and the negative wires are made of Constantan
- Temperature range of -200° C to +900° C

■ Weldable, Double-Ended

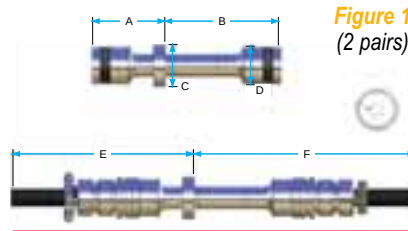


Figure 1
(2 pairs)

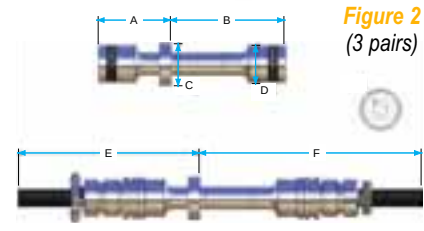


Figure 2
(3 pairs)

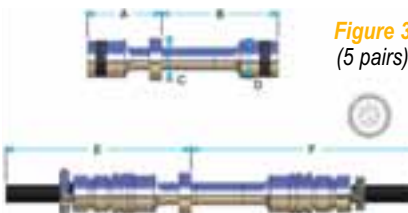


Figure 3
(5 pairs)

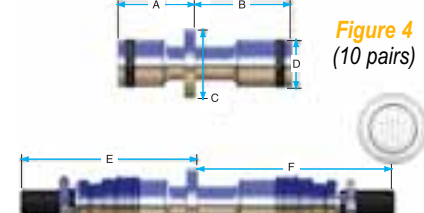


Figure 4
(10 pairs)

Figure	Air Side	Vac. Side	T/C Pairs	Dimensions (in.)						Part No.	Price
				A	B	C	D	E	F		
1	Mil-Spec Plug	Mil-Spec Plug	2	2.34	3.69	1.372	1.25	4.17	5.52	TFD2EA00001	Call
2	Mil-Spec Plug	Mil-Spec Plug	3	2.34	3.69	1.372	1.25	4.17	5.52	TFD3EA00001	Call
3	Mil-Spec Plug	Mil-Spec Plug	5	2.34	3.69	1.372	1.25	4.17	5.52	TFD5EA00001	Call
4	Mil-Spec Plug	Mil-Spec Plug	10	2.78	3.50	2.495	1.75	5.03	5.32	TFDVEA00001	Call

Refer to Connectors & Cabling, starting on page 3-113, for mil-spec connectors, t/c wire, wire beads, ceramic wire discs, and crimp/solder connectors.

■ CF Flange, Double-Ended

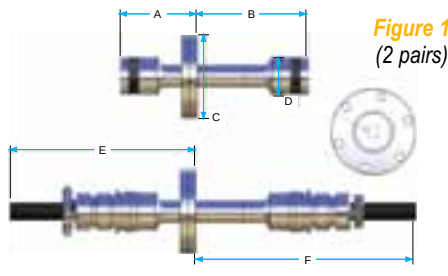


Figure 1
(2 pairs)

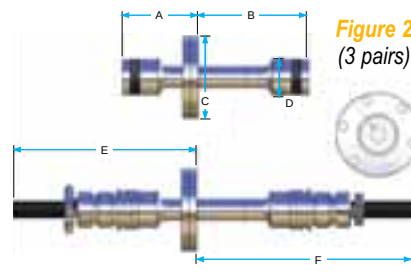


Figure 2
(3 pairs)

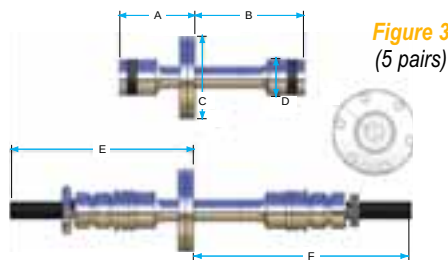


Figure 3
(5 pairs)

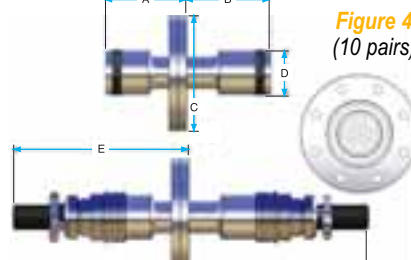


Figure 4
(10 pairs)

Figure	Air Side	Vac. Side	Flange Size	T/C Pairs	Dimensions (in.)						Part No.	Price
					A	B	C	D	E	F		
1	Mil-Spec Plug	Mil-Spec Plug	2.75" CF	2	2.34	3.69	2.75	1.25	4.17	5.52	TFD2EA00003	Call
2	Mil-Spec Plug	Mil-Spec Plug	2.75" CF	3	2.34	3.69	2.75	1.25	4.17	5.52	TFD3EA00003	Call
3	Mil-Spec Plug	Mil-Spec Plug	2.75" CF	5	2.34	3.69	2.75	1.25	4.17	5.52	TFD5EA00003	Call
4	Mil-Spec Plug	Mil-Spec Plug	4.50" CF	10	2.78	3.50	4.50	1.75	5.03	5.32	TFDVEA00006	Call

Refer to Connectors & Cabling, starting on page 3-113, for mil-spec connectors, t/c wire, wire beads, ceramic wire discs, and crimp/solder connectors.

➤ Type E Mil-Spec Plug

■ KF (QF) Flange, Double-Ended

3

Feedthroughs

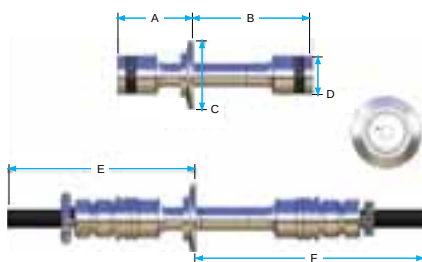


Figure 1 (2 pairs)

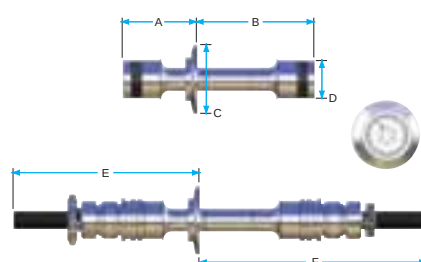


Figure 2 (3 pairs)

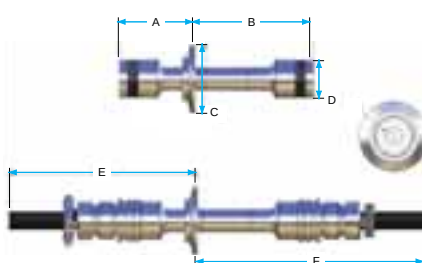


Figure 3 (5 pairs)

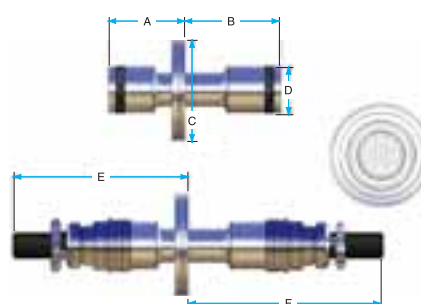
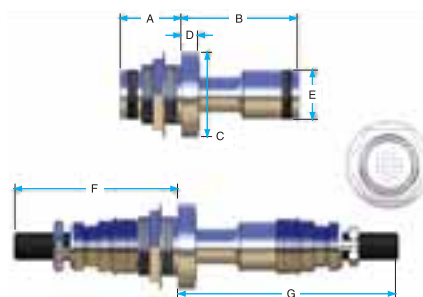


Figure 4 (10 pairs)

Figure	Air Side	Vac. Side	Flange Size	T/C Pairs	Dimensions (in.)						Part No.	Price
					A	B	C	D	E	F		
1	Mil-Spec Plug	Mil-Spec Plug	KF40	2	2.34	3.69	2.16	1.25	4.17	5.52	TFD2EA00008B	Call
1	Mil-Spec Plug	Mil-Spec Plug	KF50	2	2.34	3.69	2.95	1.25	4.17	5.52	TFD2EA00008C	Call
2	Mil-Spec Plug	Mil-Spec Plug	KF40	3	2.34	3.69	2.16	1.25	4.17	5.52	TFD3EA00008B	Call
2	Mil-Spec Plug	Mil-Spec Plug	KF50	3	2.34	3.69	2.95	1.25	4.17	5.52	TFD3EA00008C	Call
3	Mil-Spec Plug	Mil-Spec Plug	KF40	5	2.34	3.69	2.16	1.25	4.17	5.52	TFD5EA00008B	Call
3	Mil-Spec Plug	Mil-Spec Plug	KF50	5	2.34	3.69	2.95	1.25	4.17	5.52	TFD5EA00008C	Call
4	Mil-Spec Plug	Mil-Spec Plug	ISO63	10	2.78	3.50	3.74	1.75	5.03	5.32	TFDVEA00008D	Call

Refer to Connectors & Cabling, starting on page 3-113, for mil-spec connectors, t/c wire, wire beads, ceramic wire discs, and crimp/solder connectors.

■ Baseplate, Double-Ended



Air Side	Vac. Side	Mounting	Pairs	Dimensions (in.)							Part No.	Price
				A	B	C	D	E	F	G		
Mil-Spec Plug	Mil-Spec Plug	2" BP	10	2.16	4.10	3.00	0.63	1.75	4.41	6.37	TFDVEA00004	Call

Refer to Connectors & Cabling, starting on page 3-113, for mil-spec connectors, t/c wire, wire beads, ceramic wire discs, and crimp/solder connectors.

➤ Type J Mini Plug

IN THIS SECTION ➤

Type J Miniature Connector Thermocouple Feedthroughs

- Designed for use in high vacuum and UHV applications
- Feature positive wires made of iron and negative wires of Constantan
- Temperature range from 0° C to 750° C
- Include air-side connectors
- Vacuum-side leads terminate in thermocouple lugs, which include a stainless steel nut and screw to facilitate thermocouple hookup

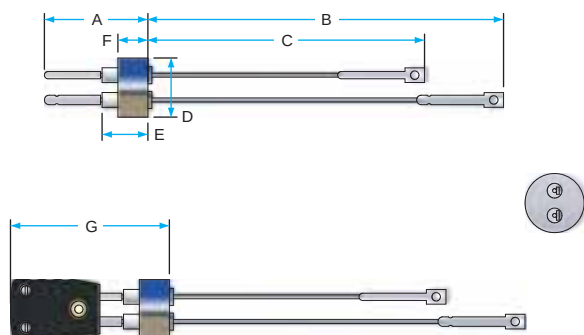


Figure 1 (1 pair)

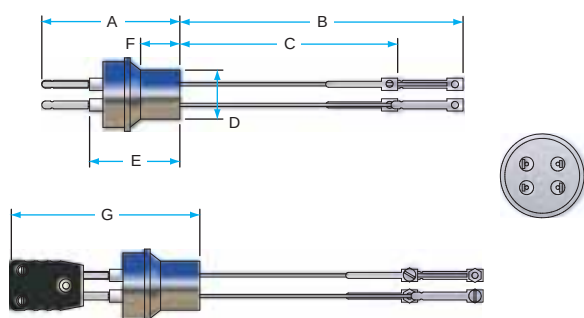


Figure 2 (2 pairs)

■ Weldable, Single-Ended

- Available in 1, 2, 3, 4, and 5 pairs

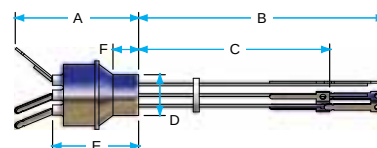
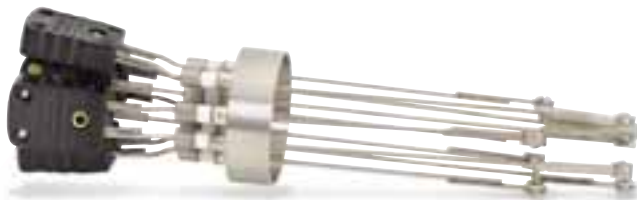


Figure 3 (3 pairs)

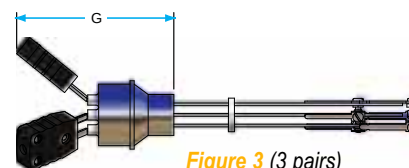


Figure 4 (4 pairs)

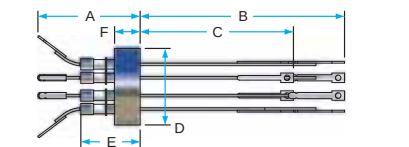


Figure 5 (5 pairs)

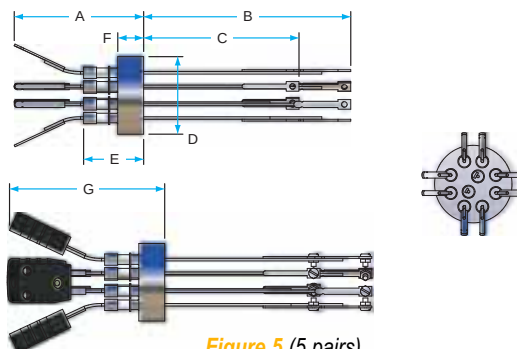


Figure	Air Side	Vac. Side	T/C Pairs	Dimensions (in.)							Part No.	Price
1	Miniature Plug	Nut/Bolt	1	1.31	4.50	3.50	0.747	0.58	0.38	1.92	TFT1JY00001	Call
2	Miniature Plug	Nut/Bolt	2	2.11	4.50	3.50	0.747	1.38	0.60	2.72	TFT2JY00001	Call
3	Miniature Plug	Nut/Bolt	3	2.26	4.50	3.50	0.747	1.58	0.47	2.90	TFT3JY00001	Call
4	Miniature Plug	Nut/Bolt	4	2.00	4.00	3.00	1.495	1.16	0.50	2.50	TFT4JY00001	Call
5	Miniature Plug	Nut/Bolt	5	2.50	4.00	3.00	1.495	1.16	0.50	3.00	TFT5JY00001	Call

Refer to Connectors & Cabling, starting on page 3-113, for miniature connectors, t/c wire, and wire beads.

➤ Type J Mini Plug

■ CF Flange, Single-Ended

- Available in 1, 2, 3, 4, and 5 pairs

3

Feedthroughs

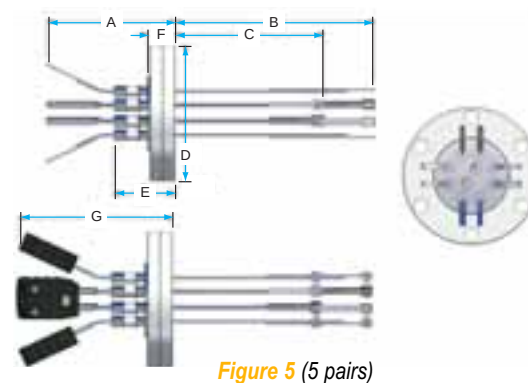
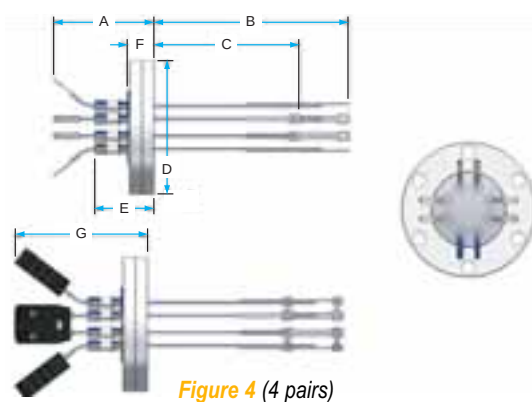
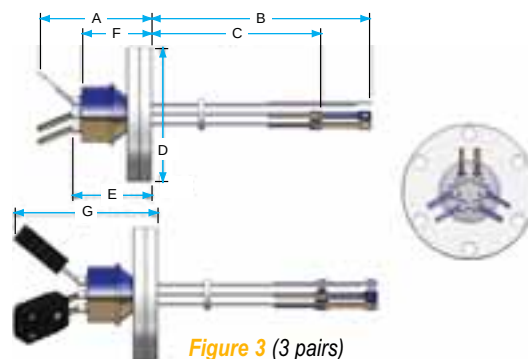
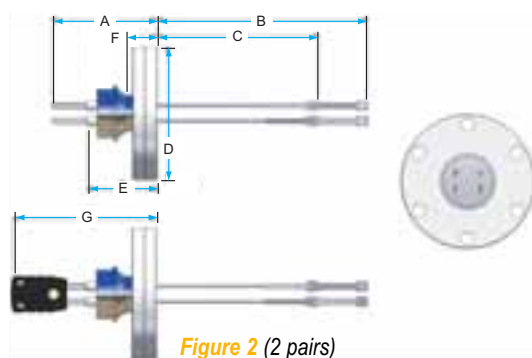


Figure	Air Side	Vac. Side	Flange Size	T/C Pairs	Dimensions (in.)							Part No.	Price
					A	B	C	D	E	F	G		
1	Miniature Plug	Nut/Bolt	1.33" CF	1	1.81	4.00	3.00	1.33	1.08	0.88	2.42	TFT1JY00002	Call
1	Miniature Plug	Nut/Bolt	2.75" CF	1	1.31	4.50	3.50	2.75	0.58	0.38	1.92	TFT1JY00003	Call
2	Miniature Plug	Nut/Bolt	1.33" CF	2	2.61	4.00	3.00	1.33	1.88	1.10	3.22	TFT2JY00002	Call
2	Miniature Plug	Nut/Bolt	2.75" CF	2	2.11	4.50	3.50	2.75	1.38	0.60	2.72	TFT2JY00003	Call
3	Miniature Plug	Nut/Bolt	1.33" CF	3	2.76	4.00	3.00	1.33	2.08	0.97	3.40	TFT3JY00002	Call
3	Miniature Plug	Nut/Bolt	2.75" CF	3	2.26	4.50	3.50	2.75	1.58	0.47	2.90	TFT3JY00003	Call
4	Miniature Plug	Nut/Bolt	2.75" CF	4	2.00	4.00	3.00	2.75	1.16	0.50	2.50	TFT4JY00003	Call
5	Miniature Plug	Nut/Bolt	2.75" CF	5	2.50	4.00	3.00	2.75	1.16	0.50	3.00	TFT5JY00003	Call

Refer to Connectors & Cabling, starting on page 3-113, for miniature connectors, t/c wire, and wire beads.

➤ Type J Mini Plug

■ KF (QF) Flange, Single-Ended

- Available in 1, 2, 3, 4, and 5 pairs

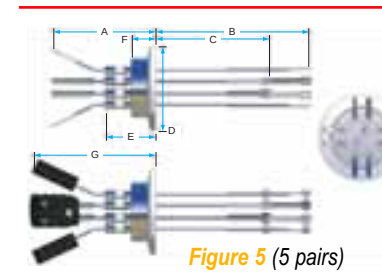
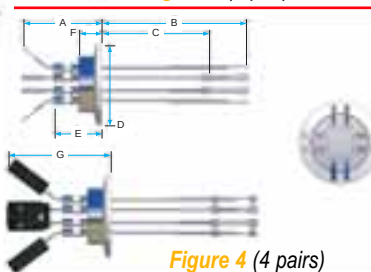
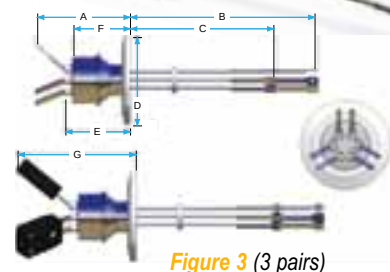
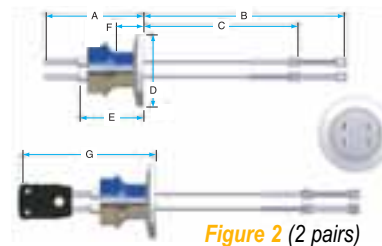
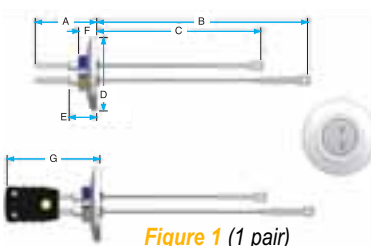


Figure	Air Side	Vac. Side	Flange Size	T/C Pairs	Dimensions (in.)								Part No.	Price
1	Miniature Plug	Nut/Bolt	KF16	1	1.31	4.50	3.50	1.18	0.58	0.38	1.92		TFT1JY00008	Call
1	Miniature Plug	Nut/Bolt	KF25	1	1.31	4.50	3.50	1.57	0.58	0.38	1.92		TFT1JY00008A	Call
1	Miniature Plug	Nut/Bolt	KF40	1	1.31	4.50	3.50	2.16	0.58	0.38	1.92		TFT1JY00008B	Call
2	Miniature Plug	Nut/Bolt	KF16	2	2.11	4.50	3.50	1.18	1.38	0.60	2.72		TFT2JY00008	Call
2	Miniature Plug	Nut/Bolt	KF25	2	2.11	4.50	3.50	1.57	1.38	0.60	2.72		TFT2JY00008A	Call
2	Miniature Plug	Nut/Bolt	KF40	2	2.11	4.50	3.50	2.16	1.38	0.60	2.72		TFT2JY00008B	Call
3	Miniature Plug	Nut/Bolt	KF16	3	2.26	4.50	3.50	1.18	1.58	0.47	2.90		TFT3JY00008	Call
3	Miniature Plug	Nut/Bolt	KF40	3	2.26	4.50	3.50	2.16	1.58	0.47	2.90		TFT3JY00008B	Call
4	Miniature Plug	Nut/Bolt	KF40	4	2.00	4.00	3.00	2.16	1.16	0.50	2.50		TFT4JY00008B	Call
5	Miniature Plug	Nut/Bolt	KF40	5	2.50	4.00	3.00	2.16	1.16	0.50	3.00		TFT5JY00008B	Call

Refer to Connectors & Cabling, starting on page 3-113, for miniature connectors, t/c wire, and wire beads.

■ 1" Baseplate, Single-Ended

- Available in 1 and 2 pairs

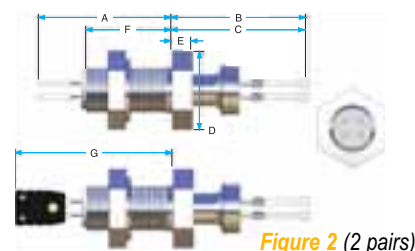
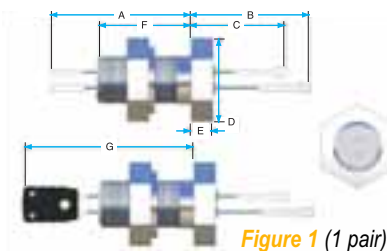


Figure	Air Side	Vac. Side	Mounting	T/C Pairs	Dimensions (in.)								Part No.	Price
1	Miniature Plug	Nut/Bolt	1" BP	1	2.88	2.44	1.94	1.50	0.44	1.88	3.81		TFT1JY00004	Call
2	Miniature Plug	Nut/Bolt	1" BP	2	2.93	2.98	2.98	1.50	0.44	1.88	3.40		TFT2JY00004	Call

Refer to Connectors & Cabling, starting on page 3-113, for miniature connectors, t/c wire, and wire beads.

■ NPT (M), Single-Ended

- Available in 1 and 2 pairs

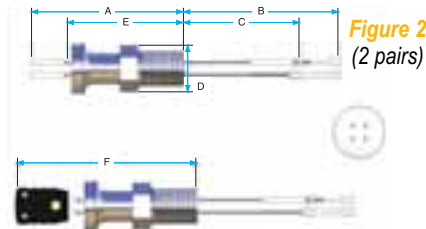
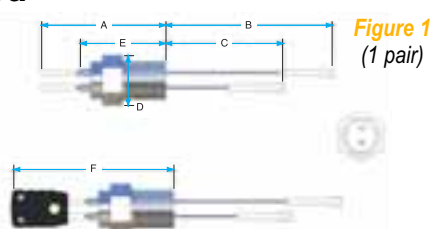


Figure	Air Side	Vac. Side	Mounting	T/C Pairs	Dimensions (in.)								Part No.	Price
1	Miniature Plug	Nut/Bolt	1/2" NPT	1	2.50	3.35	2.35	0.88	1.72	3.06			TFT1JY00005	Call
2	Miniature Plug	Nut/Bolt	1/2" NPT	2	3.29	3.35	2.35	0.88	2.51	3.84			TFT2JY00005	Call

Refer to Connectors & Cabling, starting on page 3-113, for miniature connectors, t/c wire, and wire beads.

➤ Type J Mil-Spec Plug

■ Weldable, Single-Ended

- Available in 2, 3, 5, and 10 pairs

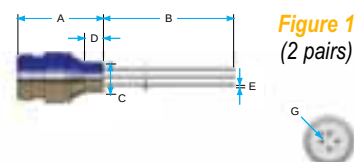


Figure 1
(2 pairs)

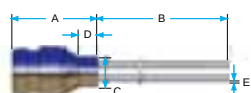


Figure 2
(3 pairs)

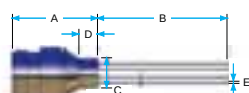


Figure 3
(5 pairs)



Figure 4
(10 pairs)



Figure	Air Side	Vac. Side	T/C Pairs	Dimensions (in.)								Part No.	Price
				A	B	C	D	E	F	G			
1	Mil-Spec Plug	Pins	2	2.35	3.20	0.747	0.46	0.056	4.03	0.38		TFT2JA00001	Call
2	Mil-Spec Plug	Pins	3	2.35	3.20	0.747	0.46	0.056	4.03	0.44		TFT3JA00001	Call
3	Mil-Spec Plug	Pins	5	2.35	3.20	0.747	0.46	0.056	4.03	0.51		TFT5JA00001	Call
4	Mil-Spec Plug	Pins	10	2.53	3.50	1.372	0.76	0.056	4.78	1.03		TFTVJA00001	Call

Refer to Connectors & Cabling, starting on page 3-113, for mil-spec connectors, crimp/solder connectors, t/c wire, wire beads, and ceramic wire discs.

■ CF Flange, Single-Ended

- Available in 2, 3, 5, and 10 pairs

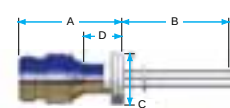


Figure 1
(2 pairs)

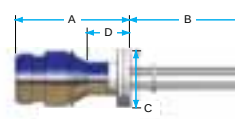


Figure 2
(3 pairs)

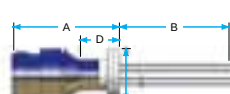


Figure 3
(5 pairs)



Figure 4
(10 pairs)



Figure	Air Side	Vac. Side	Flange Size	T/C Pairs	Dimensions (in.)								Part No.	Price
					A	B	C	D	E	F				
1	Mil-Spec Plug	Pins	1.33" CF	2	2.85	2.70	1.33	0.96	4.53	0.38			TFT2JA00002	Call
1	Mil-Spec Plug	Pins	2.75" CF	2	2.35	3.20	2.75	0.46	4.03	0.38			TFT2JA00003	Call
2	Mil-Spec Plug	Pins	1.33" CF	3	2.85	2.70	1.33	0.96	4.53	0.44			TFT3JA00002	Call
2	Mil-Spec Plug	Pins	2.75" CF	3	2.35	3.20	2.75	0.46	4.03	0.44			TFT3JA00003	Call
3	Mil-Spec Plug	Pins	1.33" CF	5	2.85	2.70	1.33	0.96	4.53	0.51			TFT5JA00002	Call
3	Mil-Spec Plug	Pins	2.75" CF	5	2.35	3.20	2.75	0.46	4.03	0.51			TFT5JA00003	Call
4	Mil-Spec Plug	Pins	2.75" CF	10	2.53	3.50	2.75	0.76	4.78	1.03			TFTVJA00003	Call

Refer to Connectors & Cabling, starting on page 3-113, for mil-spec connectors, crimp/solder connectors, t/c wire, wire beads, and ceramic wire discs.

► Type J Mil-Spec Plug

■ KF (QF) Flange, Single-Ended

- Available in 2, 3, 5, and 10 pairs

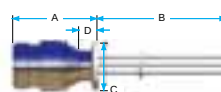


Figure 1
(2 pairs)



Figure 2
(3 pairs)

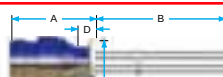


Figure 3
(5 pairs)



Figure 4
(4 pairs)



Figure	Air Side	Vac. Side	Flange Size	T/C Pairs	Dimensions (in.)							Part No.	Price
1	Mil-Spec Plug	Pins	KF16	2	2.35	3.20	1.18	0.46	4.03	0.38		TFT2JA00008	Call
1	Mil-Spec Plug	Pins	KF40	2	2.35	3.20	2.16	0.46	4.03	0.38		TFT2JA00008B	Call
2	Mil-Spec Plug	Pins	KF16	3	2.35	3.20	1.18	0.46	4.03	0.44		TFT3JA00008	Call
2	Mil-Spec Plug	Pins	KF40	3	2.35	3.20	2.16	0.46	4.03	0.44		TFT3JA00008B	Call
3	Mil-Spec Plug	Pins	KF16	5	2.35	3.20	1.18	0.46	4.03	0.51		TFT5JA00008	Call
3	Mil-Spec Plug	Pins	KF40	5	2.35	3.20	2.16	0.46	4.03	0.51		TFT5JA00008B	Call
4	Mil-Spec Plug	Pins	KF40	10	2.53	3.50	2.16	0.76	4.78	1.03		TFTVJA00008B	Call

Refer to Connectors & Cabling, starting on page 3-113, for mil-spec connectors, crimp/solder connectors, t/c wire, wire beads, and ceramic wire discs.

■ 1/2" NPT(M), Single-Ended

- Available in 2, 3, and 5 pairs



Figure 1
(2 pairs)



Figure 2
(3 pairs)



Figure 3
(5 pairs)



Figure	Air Side	Vac. Side	Mounting	T/C Pairs	Dimensions (in.)							Part No.	Price
1	Mil-Spec Plug	Pins	1/2" NPT	2	3.49	2.06	0.87	0.056	5.32	0.38		TFT2JA00005	Call
2	Mil-Spec Plug	Pins	1/2" NPT	3	3.49	2.06	0.87	0.056	5.32	0.44		TFT3JA00005	Call
3	Mil-Spec Plug	Pins	1/2" NPT	5	3.49	2.06	0.87	0.056	5.32	0.51		TFT5JA00005	Call

Refer to Connectors & Cabling, starting on page 3-113, for mil-spec connectors, crimp/solder connectors, t/c wire, wire beads, and ceramic wire discs.

► Type J Push-On

■ Weldable

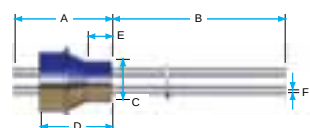


Figure 1 (3 pairs)

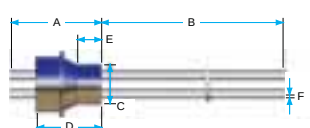


Figure 2 (5 pairs)



Figure	Air Side	Vac. Side	T/C Pairs	Dimensions (in.)							Part No.	Price
1	Pins	Pins	3	2.05	3.20	0.747	1.43	0.46	0.056	0.44	TFT3JP00001	Call
2	Pins	Pins	5	2.05	3.20	0.747	1.43	0.46	0.056	0.51	TFT5JP00001	Call

Refer to Connectors & Cabling, starting on page 3-113, for crimp/solder connectors, t/c wire, wire beads, and ceramic wire discs.

➤ Type J Push-On

■ CF Flange

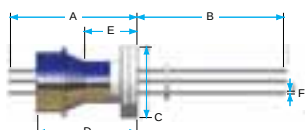


Figure 1 (2 pairs)

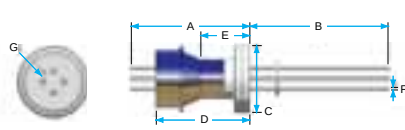


Figure 2 (3 pairs)

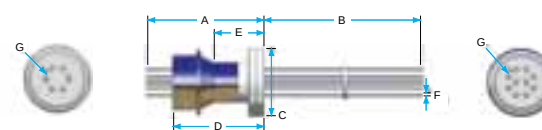


Figure 3 (5 pairs)

Figure	Air Side	Vac. Side	Flange Size	T/C Pairs	Dimensions (in.)								Part No.	Price
1	Pins	Pins	1.33" CF	2	2.55	2.70	1.33	1.93	0.96	0.056	0.38		TFT2JP00002	Call
1	Pins	Pins	2.75" CF	2	2.05	3.20	2.75	1.43	0.46	0.056	0.38		TFT2JP00003	Call
2	Pins	Pins	1.33" CF	3	2.55	2.70	1.33	1.93	0.96	0.056	0.44		TFT3JP00002	Call
2	Pins	Pins	2.75" CF	3	2.05	3.20	2.75	1.43	0.46	0.056	0.44		TFT3JP00003	Call
3	Pins	Pins	1.33" CF	5	2.55	2.70	1.33	1.93	0.96	0.056	0.51		TFT5JP00002	Call
3	Pins	Pins	2.75" CF	5	2.05	3.20	2.75	1.43	0.46	0.056	0.51		TFT5JP00003	Call

Refer to Connectors & Cabling, starting on page 3-113, for crimp/solder connectors, t/c wire, wire beads, and ceramic wire discs.

■ KF (QF) Flange

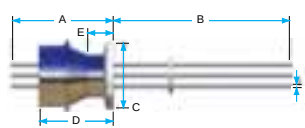


Figure 1 (2 pairs)

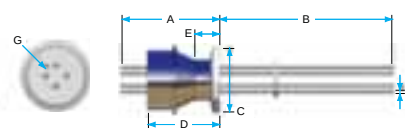


Figure 2 (3 pairs)

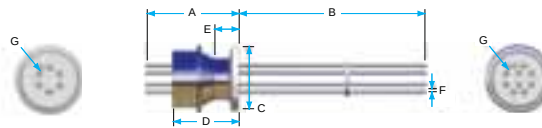


Figure 3 (5 pairs)

Figure	Air Side	Vac. Side	Flange Size	T/C Pairs	Dimensions (in.)								Part No.	Price
1	Pins	Pins	KF16	2	2.05	3.20	1.18	1.43	0.46	0.056	0.38		TFT2JP00008	Call
1	Pins	Pins	KF40	2	2.05	3.20	2.16	1.43	0.46	0.056	0.38		TFT2JP00008B	Call
2	Pins	Pins	KF16	3	2.05	3.20	1.18	1.43	0.46	0.056	0.44		TFT3JP00008	Call
2	Pins	Pins	KF40	3	2.05	3.20	2.16	1.43	0.46	0.056	0.44		TFT3JP00008B	Call
3	Pins	Pins	KF16	5	2.05	3.20	1.18	1.43	0.46	0.056	0.51		TFT5JP00008	Call
3	Pins	Pins	KF40	5	2.05	3.20	2.16	1.43	0.46	0.056	0.51		TFT5JP00008B	Call

Refer to Connectors & Cabling, starting on page 3-113, for crimp/solder connectors, t/c wire, wire beads, and ceramic wire discs.

■ 1/2" NPT(M)

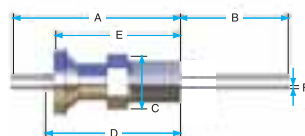


Figure 1 (2 pairs)

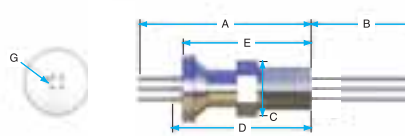


Figure 2 (3 pairs)

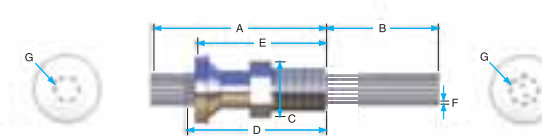


Figure 3 (5 pairs)

Figure	Air Side	Vac. Side	Mounting	T/C Pairs	Dimensions (in.)								Part No.	Price
1	Pins	Pins	1/2" NPT	2	3.19	2.06	0.87	2.57	2.38	0.056	0.38		TFT2JP00005	Call
2	Pins	Pins	1/2" NPT	3	3.19	2.06	0.87	2.57	2.38	0.056	0.44		TFT3JP00005	Call
3	Pins	Pins	1/2" NPT	5	3.19	2.06	0.87	2.57	2.38	0.056	0.51		TFT5JP00005	Call

Refer to Connectors & Cabling, starting on page 3-113, for crimp/solder connectors, t/c wire, wire beads, and ceramic wire discs.

➤ Type J Mini Plug Plus Power

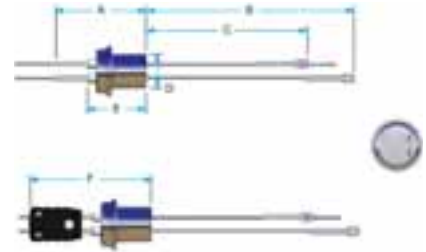
IN THIS SECTION ➤

Type J T/C Plus Power

- Nickel or copper power conductors
- Rated to 5,000 volts and 30 amps
- Use in high vacuum and UHV applications requiring both power and temperature measurements
- Feature positive wires made of iron and negative wires made of Constantan
- Temperature range from 0° C to 750° C.

■ Weldable, Single-Ended

- Assembly supplied with miniature air-side thermocouple connectors and vacuum-side thermocouple lugs with a #3-48 screw and nut



NOTE: Power leads are not supplied with connectors. Must be purchased separately.

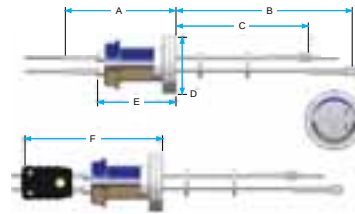
3

Feedthroughs

Air Side	Vac. Side	T/C Pairs	Power Pins	Amps/Pin	Dimensions (in.)						Part No.	Price
					A	B	C	D	E	F		
Miniature Plug	Nut/Bolt	1	(2) 0.050" Cu	15	2.00	4.50	3.50	0.747	1.27	2.72	TFT1JY2C151	Call
Miniature Plug	Nut/Bolt	1	(2) 0.094" Cu	30	2.00	4.50	3.50	0.747	1.27	2.72	TFT1JY2C301	Call
Miniature Plug	Nut/Bolt	1	(2) 0.050" Ni	5	2.00	4.50	3.50	0.747	1.27	2.72	TFT1JY2N051	Call
Miniature Plug	Nut/Bolt	1	(2) 0.094" Ni	15	2.35	4.36	3.36	0.747	1.36	2.95	TFT1JY2N151	Call

Refer to Connectors & Cabling, starting on page 3-113, for miniature connectors, t/c wire, wire beads, inline barrel connectors, set screw connectors, crimp/solder connectors, and bare wire.

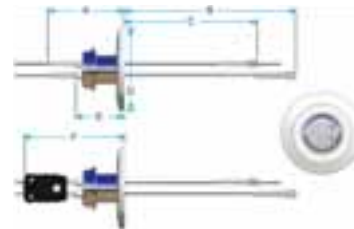
■ CF Flange, Single-Ended



Air Side	Vac. Side	Flange Size	T/C Pairs	Power Pins	Amps/Pin	Dimensions (in.)						Part No.	Price
						A	B	C	D	E	F		
Miniature Plug	Nut/Bolt	1.33" CF	1	(2) 0.050" Cu	15	2.50	4.00	3.00	1.33	1.77	1.19	TFT1JY2C152	Call
Miniature Plug	Nut/Bolt	2.75" CF	1	(2) 0.050" Cu	15	2.00	4.50	3.50	2.75	1.27	0.69	TFT1JY2C153	Call
Miniature Plug	Nut/Bolt	1.33" CF	1	(2) 0.094" Cu	30	2.50	4.00	3.00	1.33	1.77	1.19	TFT1JY2C302	Call
Miniature Plug	Nut/Bolt	2.75" CF	1	(2) 0.094" Cu	30	2.00	4.50	3.50	2.75	1.27	0.69	TFT1JY2C303	Call
Miniature Plug	Nut/Bolt	1.33" CF	1	(2) 0.050" Ni	5	2.50	4.00	3.00	1.33	1.77	1.19	TFT1JY2N052	Call
Miniature Plug	Nut/Bolt	2.75" CF	1	(2) 0.050" Ni	5	2.00	4.50	3.50	2.75	1.27	0.69	TFT1JY2N053	Call
Miniature Plug	Nut/Bolt	1.33" CF	1	(2) 0.094" Ni	15	2.85	3.86	2.86	1.33	1.86	3.45	TFT1JY2N152	Call
Miniature Plug	Nut/Bolt	2.75" CF	1	(2) 0.094" Ni	15	2.35	4.36	3.36	2.75	1.36	2.95	TFT1JY2N153	Call

Refer to Connectors & Cabling, starting on page 3-113, for miniature connectors, t/c wire, wire beads, inline barrel connectors, set screw connectors, crimp/solder connectors, and bare wire.

■ KF (QF) Flange, Single-Ended



Air Side	Vac. Side	Flange Size	T/C Pairs	Power Pins	Amps/Pin	Dimensions (in.)						Part No.	Price
						A	B	C	D	E	F		
Miniature Plug	Nut/Bolt	KF16	1	(2) 0.050" Cu	15	2.00	4.50	3.50	1.18	1.27	2.72	TFT1JY2C158	Call
Miniature Plug	Nut/Bolt	KF25	1	(2) 0.050" Cu	15	2.00	4.50	3.50	1.57	1.27	2.72	TFT1JY2C158A	Call
Miniature Plug	Nut/Bolt	KF40	1	(2) 0.050" Cu	15	2.00	4.50	3.50	2.16	1.27	2.72	TFT1JY2C158B	Call
Miniature Plug	Nut/Bolt	KF16	1	(2) 0.094" Cu	30	2.00	4.50	3.50	1.18	1.27	2.72	TFT1JY2C308	Call
Miniature Plug	Nut/Bolt	KF40	1	(2) 0.094" Cu	30	2.00	4.50	3.50	2.16	1.27	2.72	TFT1JY2C308B	Call
Miniature Plug	Nut/Bolt	KF16	1	(2) 0.050" Ni	5	2.00	4.50	3.50	1.18	1.27	2.72	TFT1JY2N058	Call
Miniature Plug	Nut/Bolt	KF40	1	(2) 0.050" Ni	5	2.00	4.50	3.50	2.16	1.27	2.72	TFT1JY2N058B	Call
Miniature Plug	Nut/Bolt	KF16	1	(2) 0.094" Ni	15	2.35	4.36	3.36	1.18	1.36	2.95	TFT1JY2N158	Call
Miniature Plug	Nut/Bolt	KF40	1	(2) 0.094" Ni	15	2.35	4.36	3.36	2.16	1.36	2.95	TFT1JY2N158B	Call

Refer to Connectors & Cabling, starting on page 3-113, for miniature connectors, t/c wire, wire beads, inline barrel connectors, set screw connectors, crimp/solder connectors, and bare wire.

➤ Type J Mil-Spec Plug

IN THIS SECTION ➤

Type J T/C

- Designed for use in high vacuum and UHV applications
- Feature positive wires made of iron and negative wires made of Constantan
- Temperature range from 0° C to 750° C
- Include air-side connectors
- Include vac-side connectors

■ Weldable, Double-Ended

- Available in 2, 3, 5, and 10 pairs.

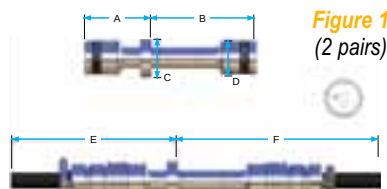


Figure 1
(2 pairs)

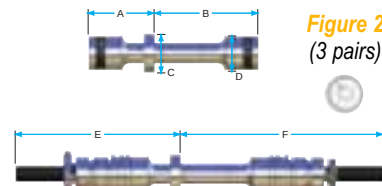


Figure 2
(3 pairs)

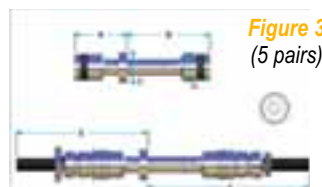


Figure 3
(5 pairs)

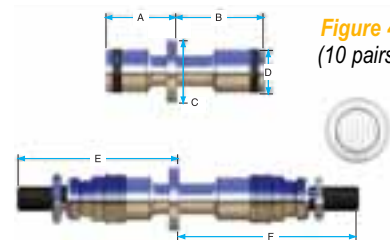


Figure 4
(10 pairs)



Figure	Air Side	Vac. Side	T/C Pairs	Dimensions (in.)						Part No.	Price
				A	B	C	D	E	F		
1	Mil-Spec Plug	Mil-Spec Plug	2	2.34	3.69	1.372	1.25	4.17	5.52	TFD2JA00001	Call
2	Mil-Spec Plug	Mil-Spec Plug	3	2.34	3.69	1.372	1.25	4.17	5.52	TFD3JA00001	Call
3	Mil-Spec Plug	Mil-Spec Plug	5	2.34	3.69	1.372	1.25	4.17	5.52	TFD5JA00001	Call
4	Mil-Spec Plug	Mil-Spec Plug	10	2.78	3.50	2.495	1.75	5.03	5.32	TFDVJA00001	Call

Refer to Connectors & Cabling, starting on page 3-113, for mil-spec connectors, t/c wire, wire beads, ceramic wire discs, and crimp/solder connectors.

■ CF Flange, Double-Ended

- Available in 2, 3, 5, and 10 pairs.

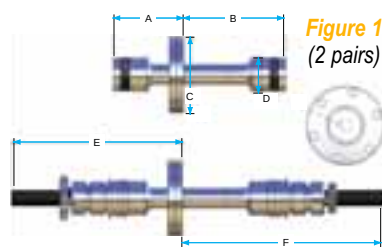


Figure 1
(2 pairs)

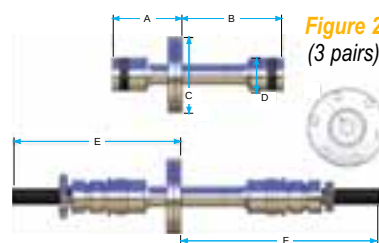


Figure 2
(3 pairs)

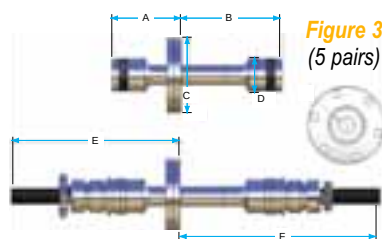


Figure 3
(5 pairs)

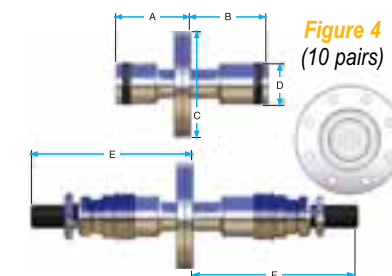


Figure 4
(10 pairs)

Figure	Air Side	Vac. Side	Flange Size	T/C Pairs	Dimensions (in.)						Part No.	Price
					A	B	C	D	E	F		
1	Mil-Spec Plug	Mil-Spec Plug	2.75" CF	2	2.34	3.69	2.75	1.25	4.17	5.52	TFD2JA00003	Call
2	Mil-Spec Plug	Mil-Spec Plug	2.75" CF	3	2.34	3.69	2.75	1.25	4.17	5.52	TFD3JA00003	Call
3	Mil-Spec Plug	Mil-Spec Plug	2.75" CF	5	2.34	3.69	2.75	1.25	4.17	5.52	TFD5JA00003	Call
4	Mil-Spec Plug	Mil-Spec Plug	4.5" CF	10	2.78	3.50	4.50	1.75	5.03	5.32	TFDVJA00006	Call

Refer to Connectors & Cabling, starting on page 3-113, for mil-spec connectors, t/c wire, wire beads, ceramic wire discs, and crimp/solder connectors.

➤ Type J Mil-Spec Plug

■ KF (QF) Flange, Double-Ended

- Available in 2, 3, 5, and 10 pairs

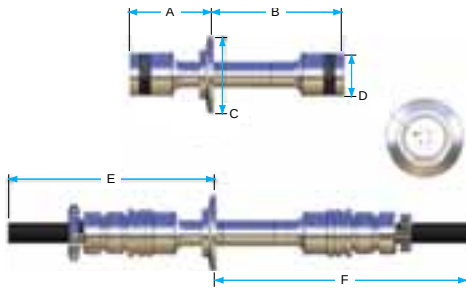


Figure 1 (2 pairs)

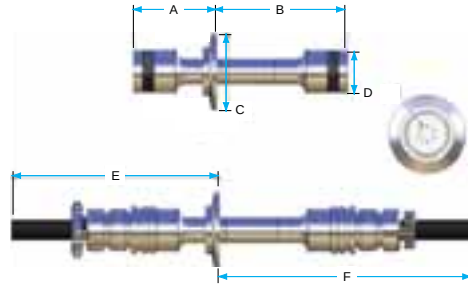


Figure 2 (3 pairs)

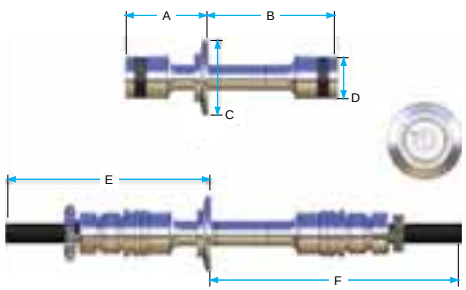


Figure 3 (5 pairs)

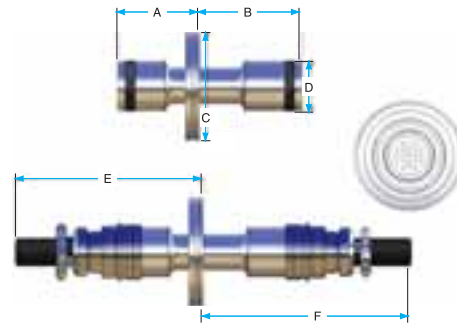


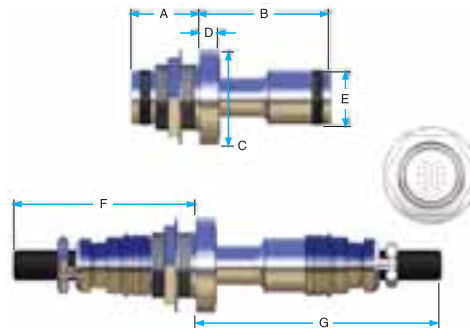
Figure 4 (10 pairs)

Figure	Air Side	Vac. Side	Flange Size	T/C Pairs	Dimensions (in.)							Part No.	Price
					A	B	C	D	E	F			
1	Mil-Spec Plug	Mil-Spec Plug	KF40	2	2.34	3.69	2.16	1.25	4.17	5.52		TFD2JA00008B	Call
1	Mil-Spec Plug	Mil-Spec Plug	KF50	2	2.34	3.69	2.95	1.25	4.17	5.52		TFD2JA00008C	Call
2	Mil-Spec Plug	Mil-Spec Plug	KF40	3	2.34	3.69	2.16	1.25	4.17	5.52		TFD3JA00008B	Call
2	Mil-Spec Plug	Mil-Spec Plug	KF50	3	2.34	3.69	2.95	1.25	4.17	5.52		TFD3JA00008C	Call
3	Mil-Spec Plug	Mil-Spec Plug	KF40	5	2.34	3.69	2.16	1.25	4.17	5.52		TFD5JA00008B	Call
3	Mil-Spec Plug	Mil-Spec Plug	KF50	5	2.34	3.69	2.95	1.25	4.17	5.52		TFD5JA00008C	Call
4	Mil-Spec Plug	Mil-Spec Plug	ISO63	10	2.78	3.50	3.74	1.75	5.03	5.32		TFDVJA00008D	Call

Refer to Connectors & Cabling, starting on page 3-113, for mil-spec connectors, t/c wire, wire beads, ceramic wire discs, and crimp/solder connectors.

■ 1" Baseplate, Double-Ended

- Available in 10 pairs



Air Side	Vac. Side	Mounting	T/C Pairs	Dimensions (in.)							Part No.	Price
				A	B	C	D	E	F	G		
Mil-Spec Plug	Mil-Spec Plug	2" BP	10	2.16	4.10	3.00	0.63	1.75	4.41	6.37	TFDVJA00004	Call

Refer to Connectors & Cabling, starting on page 3-113, for mil-spec connectors, t/c wire, wire beads, ceramic wire discs, and crimp/solder connectors.

➤ Type K Mini Plug

IN THIS SECTION ➤

Type K

- Designed for use in high vacuum and UHV applications
- Feature positive wires made of Chromel® and negative wires made of Alumel®
- Temperature range from -200° C to 1,250° C
- Include air-side connectors
- Vacuum-side leads terminate in thermocouple lugs, which include a stainless steel nut and screw to facilitate thermocouple hookup

■ Weldable, Single-End

- Available in 1, 2, 3, 4, and 5 pairs

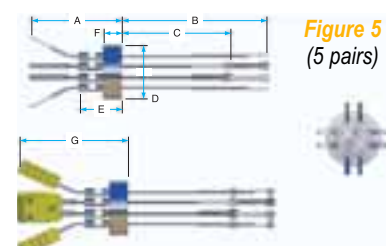
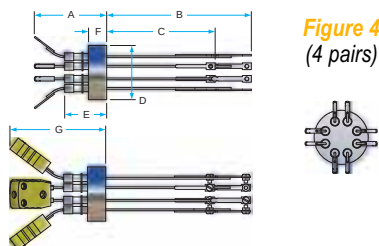
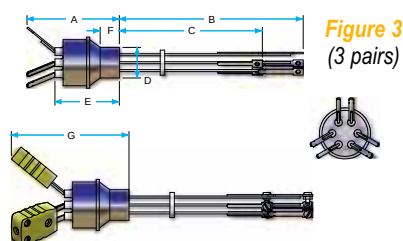
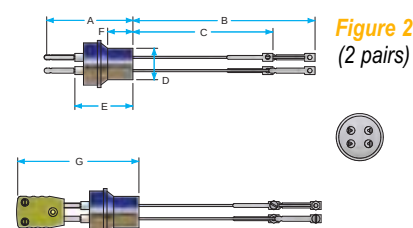
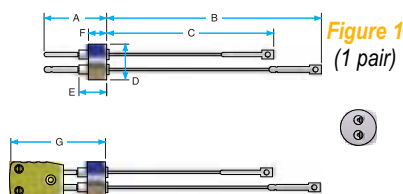
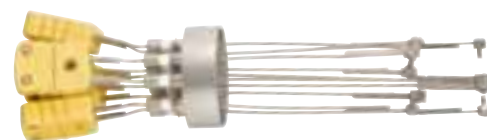


Figure	Air Side	Vac. Side	T/C Pairs	Dimensions (in.)								Part No.	Price
				A	B	C	D	E	F	G			
1	Miniature Plug	Nut/Bolt	1	1.31	4.50	3.50	0.747	0.58	0.38	1.92		TFT1KY00001	Call
2	Miniature Plug	Nut/Bolt	2	2.11	4.50	3.50	0.747	1.38	0.60	2.72		TFT2KY00001	Call
3	Miniature Plug	Nut/Bolt	3	2.26	4.50	3.50	0.747	1.58	0.47	2.90		TFT3KY00001	Call
4	Miniature Plug	Nut/Bolt	4	2.00	4.00	3.00	1.495	1.16	0.50	2.50		TFT4KY00001	Call
5	Miniature Plug	Nut/Bolt	5	2.50	4.00	3.00	1.495	1.16	0.50	3.00		TFT5KY00001	Call

Refer to Connectors & Cabling, starting on page 3-113, for miniature connectors, t/c wire, and wire beads.

■ CF Flange, Single-End

- Available in 1, 2, 3, 4, and 5 pairs

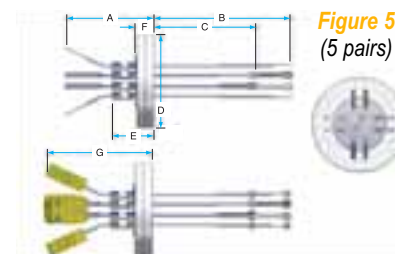
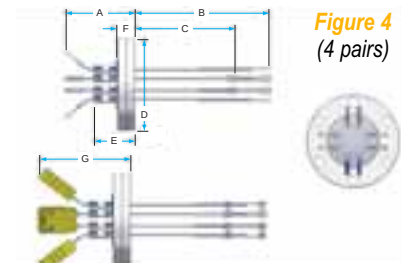
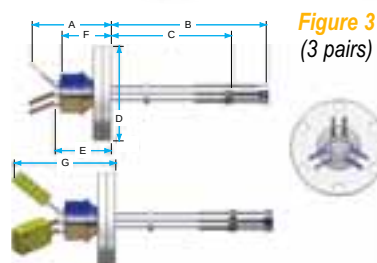
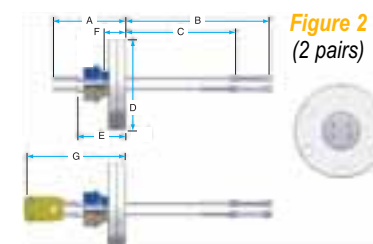
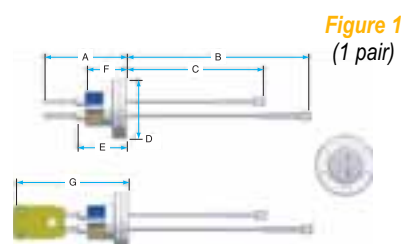
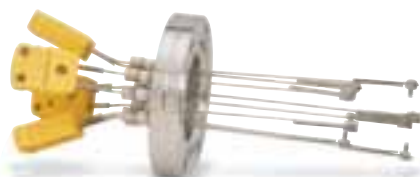


Figure	Air Side	Vac. Side	Flange Size	T/C Pairs	Dimensions (in.)								Part No.	Price
					A	B	C	D	E	F	G			
1	Miniature Plug	Nut/Bolt	1.33" CF	1	1.81	4.00	3.00	1.33	1.08	0.38	2.42		TFT1KY00002	Call
1	Miniature Plug	Nut/Bolt	2.75" CF	1	1.31	4.50	3.50	2.75	0.58	0.38	1.92		TFT1KY00003	Call
1	Miniature Plug	Nut/Bolt	3.375" CF	1	1.31	4.50	3.50	3.375	0.58	0.38	1.92		TFT1KY00003A	Call
2	Miniature Plug	Nut/Bolt	1.33" CF	2	2.61	4.00	3.00	1.33	1.88	1.10	3.22		TFT2KY00002	Call
2	Miniature Plug	Nut/Bolt	2.75" CF	2	2.11	4.50	3.50	2.75	1.38	0.60	2.72		TFT2KY00003	Call
2	Miniature Plug	Nut/Bolt	3.375" CF	2	2.11	4.50	3.50	3.375	1.38	0.60	2.72		TFT2KY00003A	Call
3	Miniature Plug	Nut/Bolt	1.33" CF	3	2.76	4.00	3.00	1.33	2.08	0.97	3.40		TFT3KY00002	Call
3	Miniature Plug	Nut/Bolt	2.75" CF	3	2.26	4.50	3.50	2.75	1.58	0.47	2.90		TFT3KY00003	Call
4	Miniature Plug	Nut/Bolt	2.75" CF	4	2.00	4.00	3.00	2.75	1.16	0.50	2.50		TFT4KY00003	Call
5	Miniature Plug	Nut/Bolt	2.75" CF	5	2.50	4.00	3.00	2.75	1.16	0.50	3.00		TFT5KY00003	Call

Refer to Connectors & Cabling, starting on page 3-113, for miniature connectors, t/c wire, and wire beads.

➤ Type K Mini Plug

■ KF (QF) Flange, Single-Ended

- Available in 1, 2, 3, 4, and 5 pairs

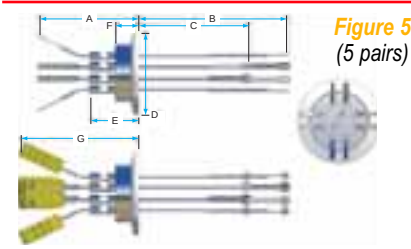
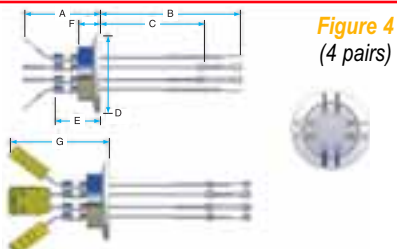
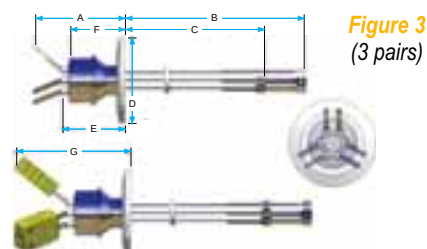
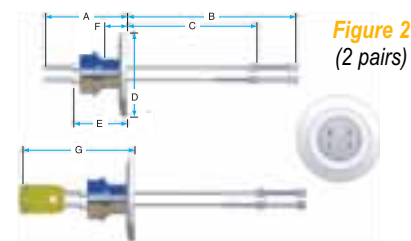
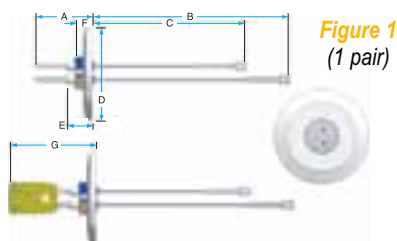
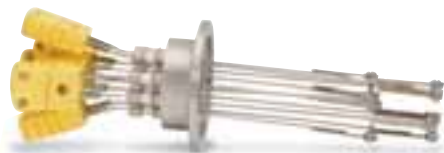


Figure	Air Side	Vac. Side	Flange Size	T/C Pairs	Dimensions (in.)								Part No.	Price
1	Miniature Plug	Nut/Bolt	KF16	1	1.31	4.50	3.50	1.18	0.58	0.38	1.92		TFT1KY00008	Call
1	Miniature Plug	Nut/Bolt	KF25	1	1.31	4.50	3.50	1.57	0.58	0.38	1.92		TFT1KY00008A	Call
1	Miniature Plug	Nut/Bolt	KF40	1	1.31	4.50	3.50	2.16	0.58	0.38	1.92		TFT1KY00008B	Call
2	Miniature Plug	Nut/Bolt	KF16	2	2.11	4.50	3.50	1.18	1.38	0.60	2.72		TFT2KY00008	Call
2	Miniature Plug	Nut/Bolt	KF25	2	2.11	4.50	3.50	1.57	1.38	0.60	2.72		TFT2KY00008A	Call
2	Miniature Plug	Nut/Bolt	KF40	2	2.11	4.50	3.50	2.16	1.38	0.60	2.72		TFT2KY00008B	Call
2	Miniature Plug	Nut/Bolt	KF50	2	2.11	4.50	3.50	2.95	1.38	0.60	2.72		TFT2KY00008C	Call
3	Miniature Plug	Nut/Bolt	KF16	3	2.26	4.50	3.50	1.18	1.58	0.47	2.90		TFT3KY00008	Call
3	Miniature Plug	Nut/Bolt	KF25	3	2.26	4.50	3.50	1.57	1.58	0.47	2.90		TFT3KY00008A	Call
3	Miniature Plug	Nut/Bolt	KF40	3	2.26	4.50	3.50	2.16	1.58	0.47	2.90		TFT3KY00008B	Call
4	Miniature Plug	Nut/Bolt	KF40	4	2.00	4.00	3.00	2.16	1.16	0.50	2.50		TFT4KY00008B	Call
5	Miniature Plug	Nut/Bolt	KF40	5	2.50	4.00	3.00	2.16	1.16	0.50	3.00		TFT5KY00008B	Call

Refer to Connectors & Cabling, starting on page 3-113, for miniature connectors, t/c wire, and wire beads.

■ 1" Baseplate, Single-Ended

- Available in 1 and 2 pairs

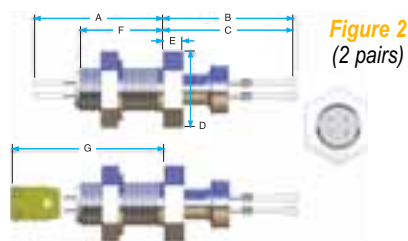
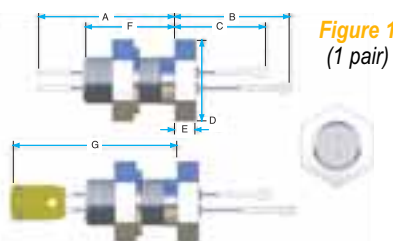


Figure	Air Side	Vac. Side	Mounting	T/C Pairs	Dimensions (in.)								Part No.	Price
1	Miniature Plug	Nut/Bolt	1" BP	1	2.88	2.44	1.94	1.50	0.44	1.88	3.81		TFT1KY00004	Call
2	Miniature Plug	Nut/Bolt	1" BP	2	2.93	2.98	2.98	1.50	0.44	1.88	3.40		TFT2KY00004	Call

Refer to Connectors & Cabling, starting on page 3-113, for miniature connectors, t/c wire, and wire beads.

■ NPT(M), Single-Ended

- Available in 1 and 2 pairs

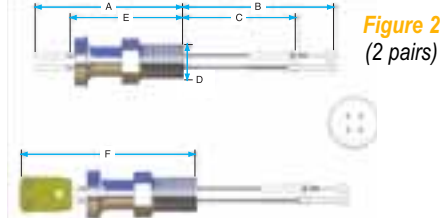
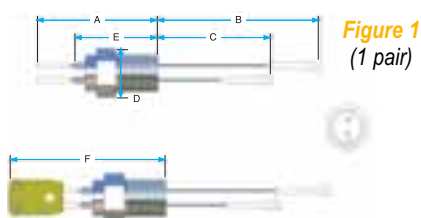


Figure	Air Side	Vac. Side	Mounting	T/C Pairs	Dimensions (in.)								Part No.	Price
1	Miniature Plug	Nut/Bolt	1/2" NPT	1	2.50	3.35	2.35	0.875	1.72	3.06			TFT1KY00005	Call
2	Miniature Plug	Nut/Bolt	1/2" NPT	2	3.29	3.35	2.35	0.875	2.51	3.84			TFT2KY00005	Call

Refer to Connectors & Cabling, starting on page 3-113, for miniature connectors, t/c wire, and wire beads.

➤ Type K Mil-Spec Plug

■ Weldable, Single-Ended

- Available in 2, 3, 5, and 10 pairs

3

Feedthroughs

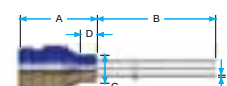


Figure 1
(2 pairs)

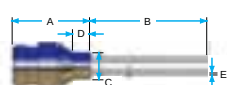


Figure 2
(3 pairs)

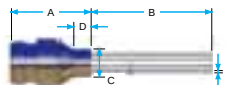


Figure 3
(5 pairs)

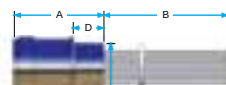


Figure 4
(10 pairs)



Figure	Air Side	Vac. Side	T/C Pairs	Dimensions (in.)								Part No.	Price
				A	B	C	D	E	F	G			
1	Mil-Spec Plug	Pins	2	2.35	3.20	0.747	0.46	0.056	4.03	0.38		TFT2KA00001	Call
2	Mil-Spec Plug	Pins	3	2.35	3.20	0.747	0.46	0.056	4.03	0.44		TFT3KA00001	Call
3	Mil-Spec Plug	Pins	5	2.35	3.20	0.747	0.46	0.056	4.03	0.51		TFT5KA00001	Call
4	Mil-Spec Plug	Pins	10	2.53	3.50	1.372	0.76	0.056	4.78	1.03		TFTVKA00001	Call

Refer to Connectors & Cabling, starting on page 3-113, for mil-spec connectors, crimp/solder connectors, t/c wire, wire beads, and ceramic wire discs.

■ CF Flange, Single-Ended

- Available in 2, 3, 5, and 10 pairs

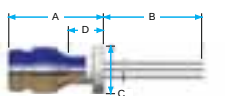


Figure 1
(2 pairs)

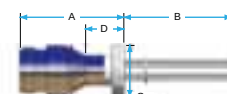


Figure 2
(3 pairs)

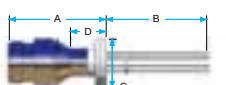


Figure 3
(5 pairs)

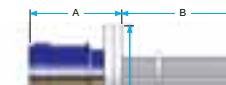


Figure 4
(10 pairs)



Figure	Air Side	Vac. Side	Flange Size	T/C Pairs	Dimensions (in.)								Part No.	Price
					A	B	C	D	E	F				
1	Mil-Spec Plug	Pins	1.33" CF	2	2.85	2.70	1.33	0.96	4.53	0.38			TFT2KA00002	Call
1	Mil-Spec Plug	Pins	2.75" CF	2	2.35	3.20	2.75	0.46	4.03	0.38			TFT2KA00003	Call
2	Mil-Spec Plug	Pins	1.33" CF	3	2.85	2.70	1.33	0.96	4.53	0.43			TFT3KA00002	Call
2	Mil-Spec Plug	Pins	2.75" CF	3	2.35	3.20	2.75	0.46	4.03	0.43			TFT3KA00003	Call
3	Mil-Spec Plug	Pins	1.33" CF	5	2.85	2.70	1.33	0.96	4.53	0.51			TFT5KA00002	Call
3	Mil-Spec Plug	Pins	2.75" CF	5	2.35	3.20	2.75	0.46	4.03	0.51			TFT5KA00003	Call
4	Mil-Spec Plug	Pins	2.75" CF	10	2.53	3.50	2.75	0.76	4.78	1.03			TFTVKA00003	Call

Refer to Connectors & Cabling, starting on page 3-113, for mil-spec connectors, crimp/solder connectors, t/c wire, wire beads, and ceramic wire discs.

➤ Type K Mil-Spec Plug

■ KF (QF) Flange, Single-Ended

- Available in 2, 3, 5, and 10 pairs

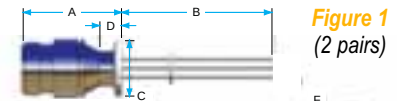


Figure 1
(2 pairs)

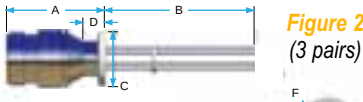
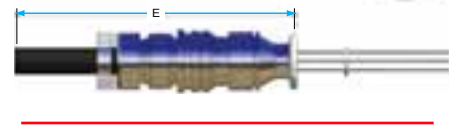


Figure 2
(3 pairs)

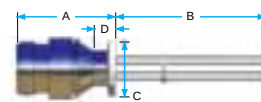


Figure 3
(5 pairs)

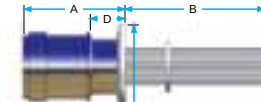


Figure 4
(10 pairs)



Figure	Air Side	Vac. Side	Flange Size	T/C Pairs	Dimensions (in.)						Part No.	Price
					A	B	C	D	E	F		
1	Mil-Spec Plug	Pins	KF16	2	2.35	3.20	1.18	0.46	4.03	0.38	TFT2KA00008	Call
1	Mil-Spec Plug	Pins	KF40	2	2.35	3.20	2.16	0.46	4.03	0.38	TFT2KA00008B	Call
2	Mil-Spec Plug	Pins	KF16	3	2.35	3.20	1.18	0.46	4.03	0.43	TFT3KA00008	Call
2	Mil-Spec Plug	Pins	KF25	3	2.35	3.20	1.57	0.46	4.03	0.43	TFT3KA00008A	Call
2	Mil-Spec Plug	Pins	KF40	3	2.35	3.20	2.16	0.46	4.03	0.43	TFT3KA00008B	Call
3	Mil-Spec Plug	Pins	KF16	5	2.35	3.20	1.18	0.46	4.03	0.51	TFT5KA00008	Call
3	Mil-Spec Plug	Pins	KF25	5	2.35	3.20	1.57	0.46	4.03	0.51	TFT5KA00008A	Call
3	Mil-Spec Plug	Pins	KF40	5	2.35	3.20	2.16	0.46	4.03	0.51	TFT5KA00008B	Call
4	Mil-Spec Plug	Pins	KF40	10	2.53	3.50	2.16	0.76	4.78	1.03	TFTVKA00008B	Call
4	Mil-Spec Plug	Pins	KF50	10	2.53	3.50	2.95	0.76	4.78	1.03	TFTVKA00008C	Call

Refer to Connectors & Cabling, starting on page 3-113, for mil-spec connectors, crimp/solder connectors, t/c wire, wire beads, and ceramic wire discs.

■ 1/2" NPT(M), Single-Ended

- Available in 2, 3, and 5 pairs

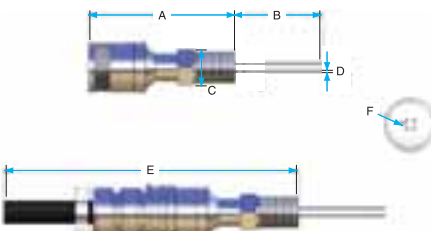


Figure 1 (2 pairs)

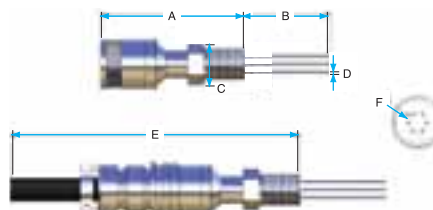


Figure 2 (3 pairs)

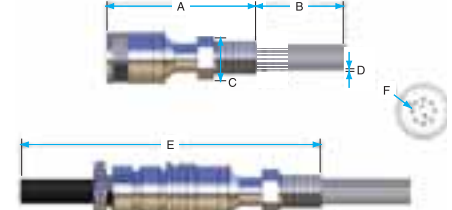


Figure 3 (5 pairs)

Figure	Air Side	Vac. Side	Mounting	T/C Pairs	Dimensions (in.)						Part No.	Price
					A	B	C	D	E	F		
1	Mil-Spec Plug	Pins	1/2" NPT	2	3.49	2.06	0.87	0.056	5.32	0.38	TFT2KA00005	Call
2	Mil-Spec Plug	Pins	1/2" NPT	3	3.49	2.06	0.87	0.056	5.32	0.44	TFT3KA00005	Call
3	Mil-Spec Plug	Pins	1/2" NPT	5	3.49	2.06	0.87	0.056	5.32	0.51	TFT5KA00005	Call

Refer to Connectors & Cabling, starting on page 3-113, for mil-spec connectors, crimp/solder connectors, t/c wire, wire beads, and ceramic wire discs.

➤ Type K Mini Plug Plus Power

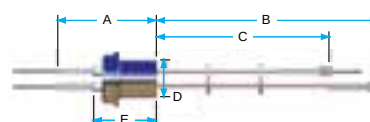
IN THIS SECTION ➤

Type K T/C Plus Power

- Two nickel or copper power conductors
- Rated to 5,000 volts and 30 amps
- Designed for use in high vacuum and UHV applications requiring both power and temperature measurements
- Feature positive wires made of Chromel® and negative wires made of Alumel®
- Temperature range from -200° C to 1,250° C
- Assemblies supplied with miniature air-side thermocouple connectors and vacuum-side thermocouple lugs with a #3-48 screw and nut

NOTE: Power leads are not supplied with connectors.
Must be purchased separately.

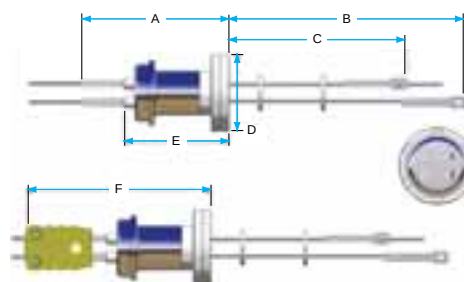
■ Weldable, Single-Ended



Air Side	Vac. Side	T/C Pairs	Power Pins	Amps/Pin	Dimensions (in.)						Part No.	Price
					A	B	C	D	E	F		
Miniature Plug	Nut/Bolt	1	(2) 0.050" Cu	15	2.14	4.50	3.50	0.747	1.36	2.72	TFT1KY2C151	Call
Miniature Plug	Nut/Bolt	1	(2) 0.094" Cu	30	2.35	4.36	3.36	0.747	1.36	2.95	TFT1KY2C301	Call
Miniature Plug	Nut/Bolt	1	(2) 0.050" Ni	5	2.14	4.50	3.50	0.747	1.36	2.72	TFT1KY2N051	Call
Miniature Plug	Nut/Bolt	1	(2) 0.092" Ni	15	2.35	4.36	3.36	0.747	1.36	2.95	TFT1KY2N151	Call

Refer to Connectors & Cabling, starting on page 3-113, for miniature connectors, t/c wire, wire beads, inline barrel connectors, set screw connectors, crimp/solder connectors, and bare wire.

■ CF Flange, Single-Ended

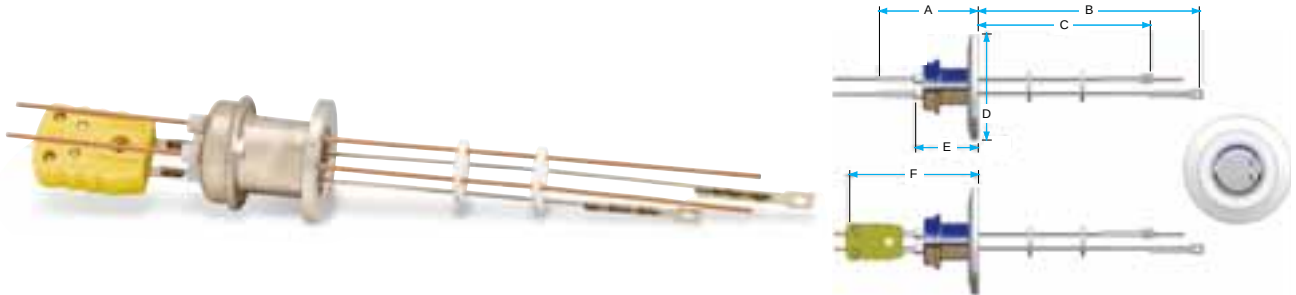


Air Side	Vac. Side	Flange Size	Pairs	Power Pins	Amps/Pin	Dimensions (in.)						Part No.	Price
						A	B	C	D	E	F		
Miniature Plug	Nut/Bolt	1.33" CF	1	(2) 0.050" Cu	15	2.64	4.00	3.00	1.33	1.86	3.22	TFT1KY2C152	Call
Miniature Plug	Nut/Bolt	2.75" CF	1	(2) 0.050" Cu	15	2.14	4.50	3.50	2.75	1.36	2.72	TFT1KY2C153	Call
Miniature Plug	Nut/Bolt	1.33" CF	1	(2) 0.094" Cu	30	2.85	3.86	2.86	1.33	1.86	3.45	TFT1KY2C302	Call
Miniature Plug	Nut/Bolt	2.75" CF	1	(2) 0.094" Cu	30	2.35	4.36	3.36	2.75	1.36	2.95	TFT1KY2C303	Call
Miniature Plug	Nut/Bolt	1.33" CF	1	(2) 0.050" Ni	5	2.64	4.00	3.00	1.33	1.86	3.22	TFT1KY2N052	Call
Miniature Plug	Nut/Bolt	2.75" CF	1	(2) 0.050" Ni	5	2.14	4.50	3.50	2.75	1.36	2.72	TFT1KY2N053	Call
Miniature Plug	Nut/Bolt	1.33" CF	1	(2) 0.092" Ni	15	2.85	3.86	2.86	1.33	1.86	3.45	TFT1KY2N152	Call
Miniature Plug	Nut/Bolt	2.75" CF	1	(2) 0.092" Ni	15	2.35	4.36	3.36	2.75	1.36	2.95	TFT1KY2N153	Call

Refer to Connectors & Cabling, starting on page 3-113, for miniature connectors, t/c wire, wire beads, inline barrel connectors, set screw connectors, crimp/solder connectors, and bare wire.

➤ Type K Mini Plug Plus Power

■ KF (QF) Flange, Single-Ended



3

Feedthroughs

Air Side	Vac. Side	Flange Size	T/C Pairs	Power Pins	Amps/Pin	Dimensions (in.)						Part No.	Price
						A	B	C	D	E	F		
Miniature Plug	Nut/Bolt	KF16	1	(2) .050" Cu	15	2.14	4.50	3.50	1.18	1.36	2.72	TFT1KY2C158	Call
Miniature Plug	Nut/Bolt	KF40	1	(2) .050" Cu	15	2.14	4.50	3.50	2.16	1.36	2.72	TFT1KY2C158B	Call
Miniature Plug	Nut/Bolt	KF50	1	(2) .050" Cu	15	2.14	4.50	3.50	2.95	1.36	2.72	TFT1KY2C158C	Call
Miniature Plug	Nut/Bolt	KF16	1	(2) .094" Cu	30	2.35	4.36	3.36	1.18	1.36	2.95	TFT1KY2C308	Call
Miniature Plug	Nut/Bolt	KF40	1	(2) .094" Cu	30	2.35	4.36	3.36	2.16	1.36	2.95	TFT1KY2C308B	Call
Miniature Plug	Nut/Bolt	KF50	1	(2) .094" Cu	30	2.35	4.36	3.36	2.95	1.36	2.95	TFT1KY2C308C	Call
Miniature Plug	Nut/Bolt	KF16	1	(2) .050" Ni	5	2.14	4.50	3.50	1.18	1.36	2.72	TFT1KY2N058	Call
Miniature Plug	Nut/Bolt	KF25	1	(2) .050" Ni	5	2.14	4.50	3.50	1.57	1.36	2.72	TFT1KY2N058A	Call
Miniature Plug	Nut/Bolt	KF40	1	(2) .050" Ni	5	2.14	4.50	3.50	2.16	1.36	2.72	TFT1KY2N058B	Call
Miniature Plug	Nut/Bolt	KF16	1	(2) .092" Ni	15	2.35	4.36	3.36	1.18	1.36	2.95	TFT1KY2N158	Call
Miniature Plug	Nut/Bolt	KF40	1	(2) .092" Ni	15	2.35	4.36	3.36	2.16	1.36	2.95	TFT1KY2N158B	Call

Refer to Connectors & Cabling, starting on page 3-113, for miniature connectors, t/c wire, wire beads, inline barrel connectors, set screw connectors, crimp/solder connectors, and bare wire.

Deposition Materials

Manufactured & Distributed by
Kurt J. Lesker Company

Novel manufacturing techniques
for conductive oxides.

Optical materials such as
Ta, Nb, and Si, designed for
optimal thin film
processing.

High volume
production of
aluminum targets
& tungsten filaments
for automotive
lighting.

➤ Type K Push-On

IN THIS SECTION ➤

Type K T/C

- Designed for use in high vacuum and UHV applications
- Feature positive wires made of Chromel® and negative wires made of Alumel®
- Temperature range from -200° C to 1,250° C
- Does not include connectors

■ Weldable, Single-Ended

- Available in 2, 3, and 5 pairs

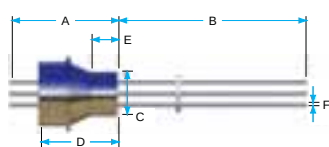


Figure 1 (2 pairs)

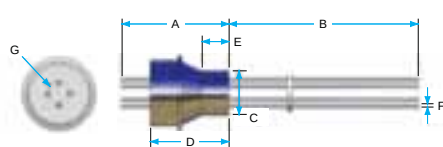


Figure 2 (3 pairs)

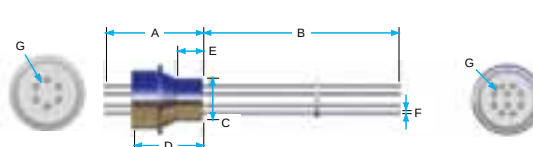


Figure 3 (5 pairs)

Figure	Air Side	Vac. Side	T/C Pairs	Dimensions (in.)								Part No.	Price
				A	B	C	D	E	F	G			
1	Pins	Pins	2	2.05	3.20	0.747	1.43	0.46	0.056	0.38		TFT2KP00001	Call
2	Pins	Pins	3	2.05	3.20	0.747	1.43	0.46	0.056	0.44		TFT3KP00001	Call
3	Pins	Pins	5	2.05	3.20	0.747	1.43	0.46	0.056	0.51		TFT5KP00001	Call

Refer to Connectors & Cabling, starting on page 3-113, for crimp/solder connectors, t/c wire, wire beads, and ceramic wire discs.

■ CF Flange, Single-Ended

- Available in 2, 3, and 5 pairs

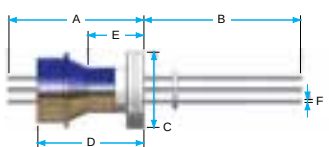


Figure 1 (2 pairs)

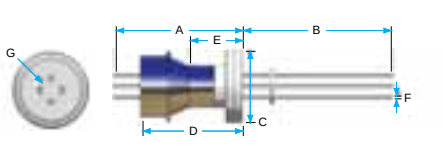


Figure 2 (3 pairs)

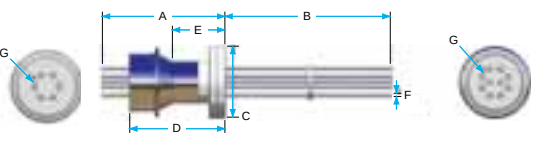


Figure 3 (5 pairs)

Figure	Air Side	Vac. Side	Flange Size	T/C Pairs	Dimensions (in.)								Part No.	Price
					A	B	C	D	E	F	G			
1	Pins	Pins	1.33" CF	2	2.55	2.70	1.33	1.93	0.96	0.056	0.38		TFT2KP00002	Call
1	Pins	Pins	2.75" CF	2	2.05	3.20	2.75	1.43	0.46	0.056	0.38		TFT2KP00003	Call
2	Pins	Pins	1.33" CF	3	2.55	2.70	1.33	1.93	0.96	0.056	0.44		TFT3KP00002	Call
2	Pins	Pins	2.75" CF	3	2.05	3.20	2.75	1.43	0.46	0.056	0.44		TFT3KP00003	Call
3	Pins	Pins	1.33" CF	5	2.55	2.70	1.33	1.93	0.96	0.056	0.51		TFT5KP00002	Call
3	Pins	Pins	2.75" CF	5	2.05	3.20	2.75	1.43	0.46	0.056	0.51		TFT5KP00003	Call

Refer to Connectors & Cabling, starting on page 3-113, for crimp/solder connectors, t/c wire, wire beads, and ceramic wire discs.

➤ Type K Push-On

■ KF (QF) Flange, Single-Ended

- Available in 2, 3, and 5 pairs

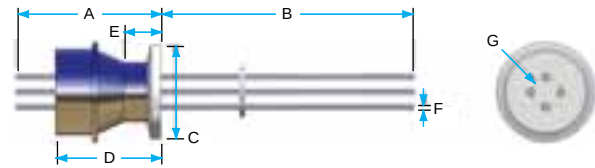
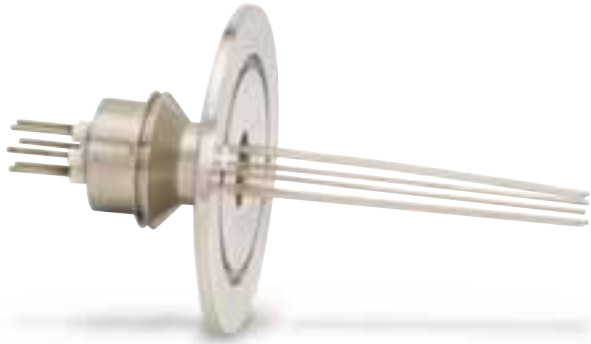


Figure 1 (2 pairs)

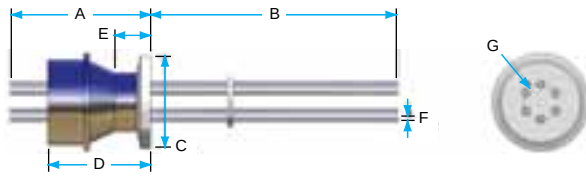


Figure 2 (3 pairs)

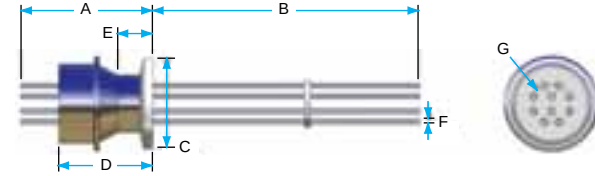


Figure 3 (5 pairs)

Figure	Air Side	Vac. Side	Flange Size	T/C Pairs	Dimensions (in.)							Part No.	Price
1	Pins	Pins	KF16	2	2.05	3.20	1.18	1.43	0.46	0.056	0.38	TFT2KP00008	Call
1	Pins	Pins	KF25	2	2.05	3.20	1.57	1.43	0.46	0.056	0.38	TFT2KP00008A	Call
1	Pins	Pins	KF40	2	2.05	3.20	2.16	1.43	0.46	0.056	0.38	TFT2KP00008B	Call
1	Pins	Pins	KF50	2	2.05	3.20	2.95	1.43	0.46	0.056	0.38	TFT2KP00008C	Call
2	Pins	Pins	KF16	3	2.05	3.20	1.18	1.43	0.46	0.056	0.44	TFT3KP00008	Call
2	Pins	Pins	KF25	3	2.05	3.20	1.57	1.43	0.46	0.056	0.44	TFT3KP00008A	Call
2	Pins	Pins	KF40	3	2.05	3.20	2.16	1.43	0.46	0.056	0.44	TFT3KP00008B	Call
2	Pins	Pins	KF50	3	2.05	3.20	2.95	1.43	0.46	0.056	0.44	TFT3KP00008C	Call
3	Pins	Pins	KF16	5	2.05	3.20	1.18	1.43	0.46	0.056	0.51	TFT5KP00008	Call
3	Pins	Pins	KF40	5	2.05	3.20	2.16	1.43	0.46	0.056	0.51	TFT5KP00008B	Call

Refer to Connectors & Cabling, starting on page 3-113, for crimp/solder connectors, t/c wire, wire beads, and ceramic wire discs.

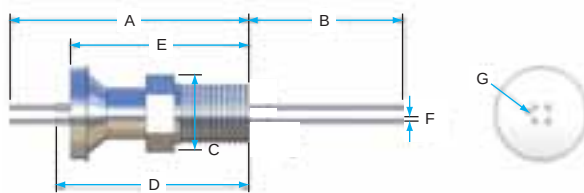


Figure 1 (2 pairs)

■ NPT(M), Single-Ended

- Available in 2, 3, and 5 pairs

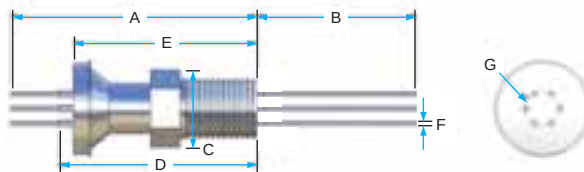


Figure 2 (3 pairs)

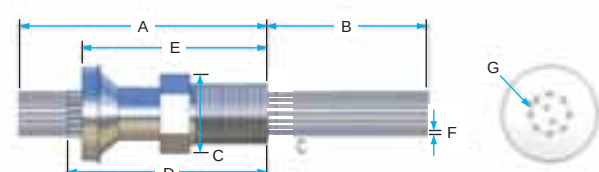


Figure 3 (5 pairs)

Figure	Air Side	Vac. Side	Mounting	T/C Pairs	Dimensions (in.)							Part No.	Price
1	Pins	Pins	1/2" NPT	2	3.19	2.06	0.87	2.57	2.38	0.056	0.38	TFT2KP00005	Call
2	Pins	Pins	1/2" NPT	3	3.19	2.06	0.87	2.57	2.38	0.056	0.44	TFT3KP00005	Call
3	Pins	Pins	1/2" NPT	5	3.19	2.06	0.87	2.57	2.38	0.056	0.51	TFT5KP00005	Call

Refer to Connectors & Cabling, starting on page 3-113, for crimp/solder connectors, t/c wire, wire beads, and ceramic wire discs.

➤ Type K Mil-Spec Plug

■ Weldable, Double-Ended

- Available in 2, 3, 5, and 10 pairs

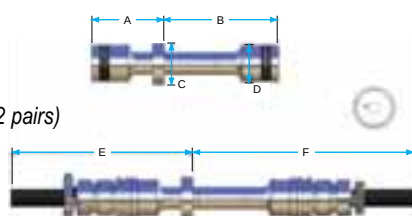


Figure 1 (2 pairs)

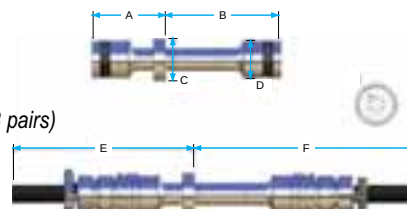


Figure 2 (3 pairs)

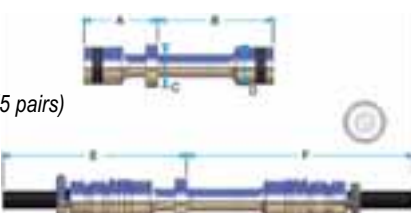


Figure 3 (5 pairs)

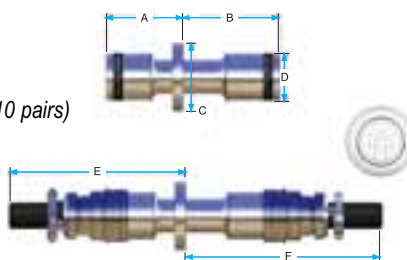


Figure 4 (10 pairs)

Figure	Air Side	Vac. Side	T/C Pairs	Dimensions (in.)						Part No.	Price
1	Mil-Spec Plug	Mil-Spec Plug	2	2.34	3.69	1.372	1.25	4.17	5.52	TFD2KA00001	Call
2	Mil-Spec Plug	Mil-Spec Plug	3	2.34	3.69	1.372	1.25	4.17	5.52	TFD3KA00001	Call
3	Mil-Spec Plug	Mil-Spec Plug	5	2.34	3.69	1.372	1.25	4.17	5.52	TFD5KA00001	Call
4	Mil-Spec Plug	Mil-Spec Plug	10	2.78	3.50	2.495	1.75	5.03	5.32	TFDVKA00001	Call

Refer to Connectors & Cabling, starting on page 3-113, for mil-spec connectors, t/c wire, wire beads, ceramic wire discs, and crimp/solder connectors.

■ CF Flange, Double-Ended

- Available in 2, 3, 5, and 10 pairs

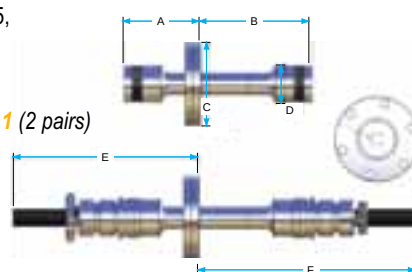


Figure 1 (2 pairs)

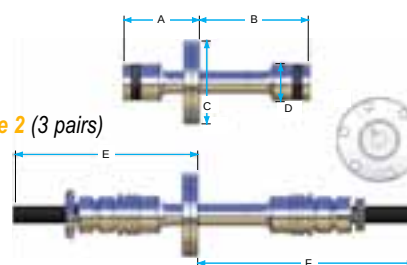


Figure 2 (3 pairs)

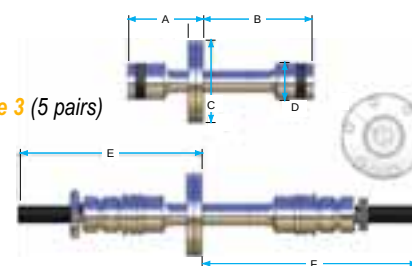


Figure 3 (5 pairs)

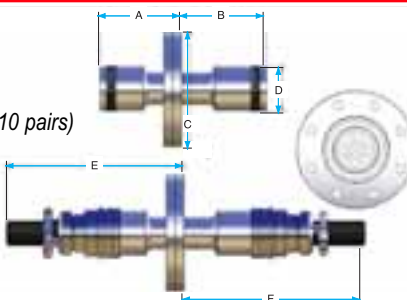


Figure 4 (10 pairs)

Figure	Air Side	Vac. Side	Flange Size	T/C Pairs	Dimensions (in.)						Part No.	Price
1	Mil-Spec Plug	Mil-Spec Plug	2.75" CF	2	2.34	3.69	2.75	1.25	4.17	5.52	TFD2KA00003	Call
2	Mil-Spec Plug	Mil-Spec Plug	2.75" CF	3	2.34	3.69	2.75	1.25	4.17	5.52	TFD3KA00003	Call
3	Mil-Spec Plug	Mil-Spec Plug	2.75" CF	5	2.34	3.69	2.75	1.25	4.17	5.52	TFD5KA00003	Call
4	Mil-Spec Plug	Mil-Spec Plug	4.5" CF	10	2.78	3.50	4.50	1.75	5.03	5.32	TFDVKA00006	Call

Refer to Connectors & Cabling, starting on page 3-113, for mil-spec connectors, t/c wire, wire beads, ceramic wire discs, and crimp/solder connectors.

➤ Type K Mil-Spec Plug

■ KF (QF) & ISO Flange, Double-Ended

- Available in 2, 3, 5, and 10 pairs

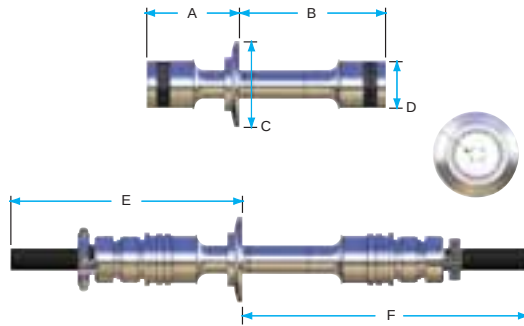


Figure 1 (2 pairs)

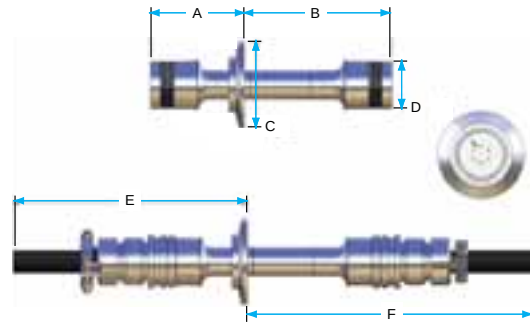


Figure 2 (3 pairs)

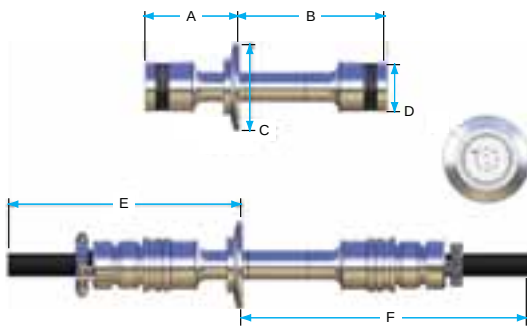


Figure 3 (5 pairs)

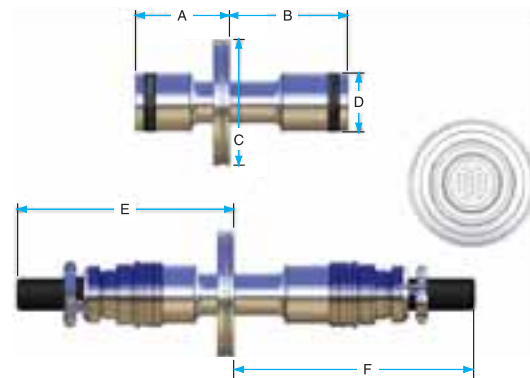


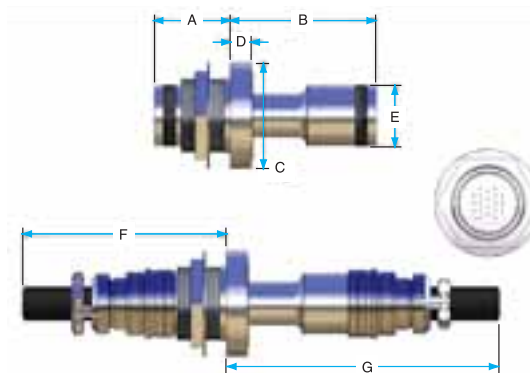
Figure 4 (10 pairs)

Figure	Air Side	Vac. Side	Flange Size	T/C Pairs	Dimensions (in.)						Part No.	Price
1	Mil-Spec Plug	Mil-Spec Plug	KF40	2	A	B	C	D	E	F	TFD2KA00008B	Call
1	Mil-Spec Plug	Mil-Spec Plug	KF50	2	2.34	3.69	2.95	1.25	4.17	5.52	TFD2KA00008C	Call
2	Mil-Spec Plug	Mil-Spec Plug	KF40	3	2.34	3.69	2.16	1.25	4.17	5.52	TFD3KA00008B	Call
2	Mil-Spec Plug	Mil-Spec Plug	KF50	3	2.34	3.69	2.95	1.25	4.17	5.52	TFD3KA00008C	Call
3	Mil-Spec Plug	Mil-Spec Plug	KF40	5	2.34	3.69	2.16	1.25	4.17	5.52	TFD5KA00008B	Call
3	Mil-Spec Plug	Mil-Spec Plug	KF50	5	2.34	3.69	2.95	1.25	4.17	5.52	TFD5KA00008C	Call
4	Mil-Spec Plug	Mil-Spec Plug	ISO63	10	2.78	3.50	3.74	1.75	5.03	5.32	TFDVKA00008D	Call

Refer to Connectors & Cabling, starting on page 3-113, for mil-spec connectors, t/c wire, wire beads, ceramic wire discs, and crimp/solder connectors.

■ Baseplate, Double-Ended

- Available in 10 pairs



Air Side	Vac. Side	Mounting	T/C Pairs	Dimensions (in.)							Part No.	Price
Mil-Spec Plug	Mil-Spec Plug	2" BP	10	A	B	C	D	E	F	G	TFDVKA00004	Call

Refer to Connectors & Cabling, starting on page 3-113, for mil-spec connectors, t/c wire, wire beads, ceramic wire discs, and crimp/solder connectors.

➤ Type R Loops

■ Weldable

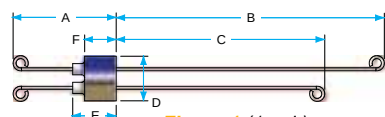
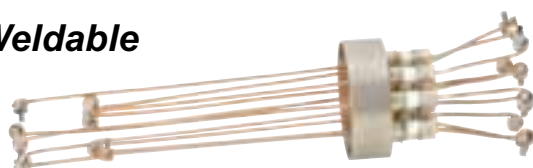


Figure 1 (1 pair)

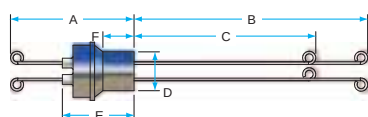


Figure 2 (2 pairs)

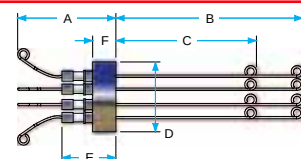


Figure 4 (4 pairs)



Figure 3 (3 pairs)

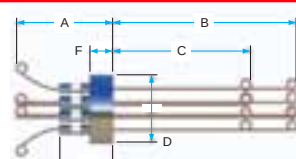


Figure 5 (5 pairs)

IN THIS SECTION ➤

Type R T/C Feedthroughs

- Designed for use in high vacuum UHV applications
- Feature positive wires made of copper and negative wires made of alloy 11 (Type R extension grade wires)
- Temperature range from 0° C to 1,450° C
- Both air-side and vacuum-side terminate

in loops and include a stainless steel nut and screw to facilitate thermocouple attachment

NOTE: Because both Type R and Type S thermocouples use identical extension grade wires, Type R feedthroughs can also be used for Type S.

Figure	Air Side	Vac. Side	T/C Pairs	Dimensions (in.)						Part No.	Price
1	Loops	Loops	1	1.73	4.50	3.50	0.75	0.73	0.53	TFT1RN00001	Call
2	Loops	Loops	2	2.38	4.50	3.50	0.75	1.38	0.60	TFT2RN00001	Call
3	Loops	Loops	3	2.00	4.50	3.50	0.75	1.58	0.47	TFT3RN00001	Call
4	Loops	Loops	4	2.00	4.00	3.00	1.50	1.16	0.50	TFT4RN00001	Call
5	Loops	Loops	5	2.13	4.00	3.00	1.50	1.16	0.50	TFT5RN00001	Call

Refer to Connectors & Cabling, starting on page 3-113, for t/c wire, and wire beads.

■ CF Flange

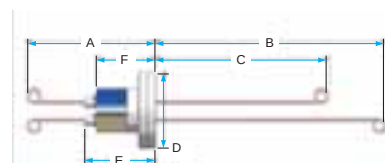


Figure 1 (1 pair)

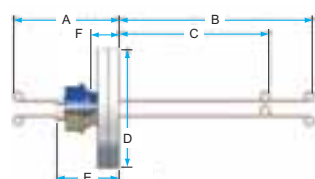


Figure 2 (2 pairs)

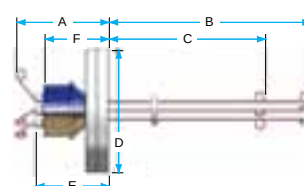


Figure 3 (3 pairs)

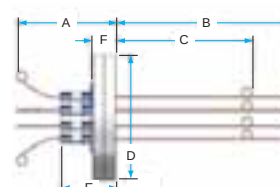


Figure 4 (4 pairs)

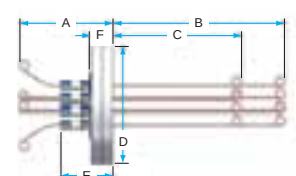


Figure 5 (5 pairs)

Figure	Air Side	Vac. Side	Flange Size	T/C Pairs	Dimensions (in.)						Part No.	Price
1	Loops	Loops	1.33" CF	1	2.23	4.00	3.00	1.33	1.23	1.03	TFT1RN00002	Call
1	Loops	Loops	2.75" CF	1	1.73	4.50	3.50	2.75	0.73	0.53	TFT1RN00003	Call
2	Loops	Loops	1.33" CF	2	2.88	4.00	3.00	1.33	1.88	1.10	TFT2RN00002	Call
2	Loops	Loops	2.75" CF	2	2.38	4.50	3.50	2.75	1.38	0.60	TFT2RN00003	Call
3	Loops	Loops	1.33" CF	3	2.50	4.00	3.00	1.33	2.08	0.97	TFT3RN00002	Call
3	Loops	Loops	2.75" CF	3	2.00	4.50	3.50	2.75	1.58	0.47	TFT3RN00003	Call
4	Loops	Loops	2.75" CF	4	2.00	4.00	3.00	2.75	1.16	0.50	TFT4RN00003	Call
5	Loops	Loops	2.75" CF	5	2.13	4.00	3.00	2.75	1.16	0.50	TFT5RN00003	Call

Refer to Connectors & Cabling, starting on page 3-113, for t/c wire, and wire beads.

➤ Type R Loops

■ KF (QF) Flange

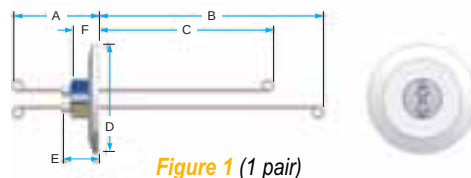


Figure 1 (1 pair)

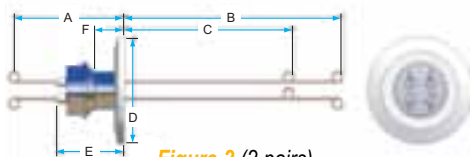


Figure 2 (2 pairs)

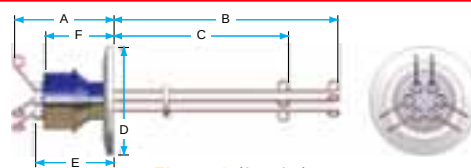


Figure 3 (3 pairs)

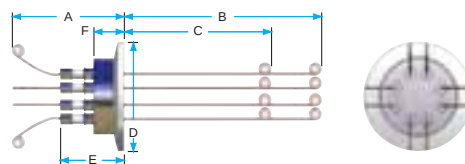


Figure 4 (4 pairs)

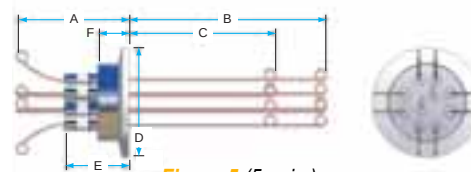


Figure 5 (5 pairs)

Figure	Air Side	Vac. Side	Flange Size	T/C Pairs	Dimensions (in.)						Part No.	Price
1	Loops	Loops	KF16	1	A	B	C	D	E	F	TFT1RN00008	Call
1	Loops	Loops	KF25	1	1.73	4.50	3.50	1.57	0.73	0.53	TFT1RN00008A	Call
1	Loops	Loops	KF40	1	1.73	4.50	3.50	2.16	0.73	0.53	TFT1RN00008B	Call
2	Loops	Loops	KF16	2	2.38	4.50	3.50	1.18	1.38	0.60	TFT2RN00008	Call
2	Loops	Loops	KF40	2	2.38	4.50	3.50	2.16	1.38	0.60	TFT2RN00008B	Call
3	Loops	Loops	KF16	3	2.00	4.50	3.50	1.18	1.58	0.47	TFT3RN00008	Call
3	Loops	Loops	KF25	3	2.00	4.50	3.50	1.57	1.58	0.47	TFT3RN00008A	Call
3	Loops	Loops	KF40	3	2.00	4.50	3.50	2.16	1.58	0.47	TFT3RN00008B	Call
4	Loops	Loops	KF40	4	2.00	4.00	3.00	2.16	1.16	0.50	TFT4RN00008B	Call
4	Loops	Loops	KF50	4	2.00	4.00	3.00	2.95	1.16	0.50	TFT4RN00008C	Call
5	Loops	Loops	KF40	5	2.13	4.00	3.00	2.16	1.16	0.50	TFT5RN00008B	Call

Refer to Connectors & Cabling, starting on page 3-113, for t/c wire, and wire beads.

■ 1" Baseplate

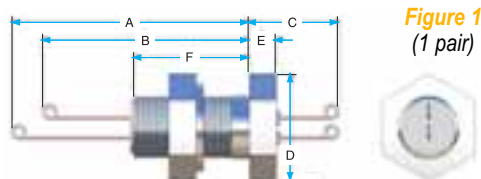


Figure 1 (1 pair)

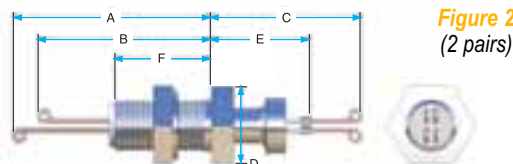


Figure 2 (2 pairs)

Figure	Air Side	Vac. Side	Mounting	T/C Pairs	Dimensions (in.)						Part No.	Price
1	Loops	Loops	1" BP	1	A	B	C	D	E	F	TFT1RN00004	Call
2	Loops	Loops	1" BP	2	3.87	3.37	1.44	1.50	0.44	1.88	TFT2RN00004	Call

Refer to Connectors & Cabling, starting on page 3-113, for t/c wire, and wire beads.

■ NPT (Male)

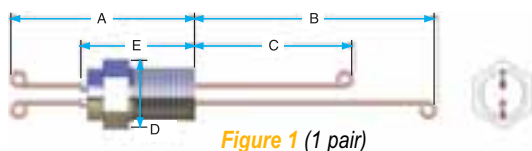


Figure 1 (1 pair)

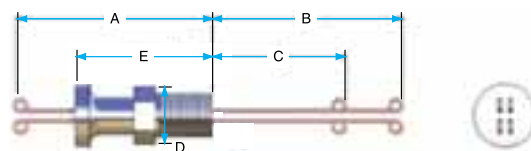


Figure 2 (2 pairs)

Figure	Air Side	Vac. Side	Mounting	T/C Pairs	Dimensions (in.)					Part No.	Price
1	Loops	Loops	1/2" NPT	1	A	B	C	D	E	TFT1RN00005	Call
2	Loops	Loops	1/2" NPT	2	3.50	3.35	2.35	0.875	2.51	TFT2RN00005	Call

Refer to Connectors & Cabling, starting on page 3-113, for t/c wire, and wire beads.

➤ Type T Loops

IN THIS SECTION ➤

Type T

- Designed for use in high vacuum and UHV applications
- Feature positive wires made of copper and negative wires made of Constantan
- Temperature range from -200° C to 350° C
- Both air-side and vacuum-side terminate in loops and include a stainless steel nut and screw to facilitate thermocouple attachment

■ Weldable

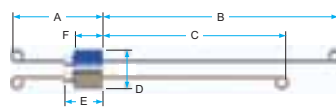


Figure 1 (1 pair)

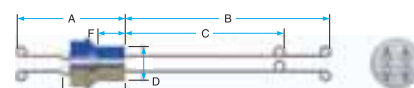


Figure 2 (2 pairs)

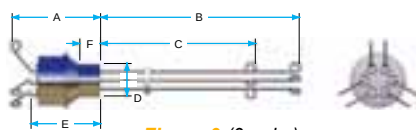


Figure 3 (3 pairs)

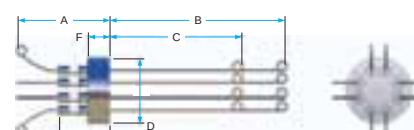


Figure 4 (4 pairs)

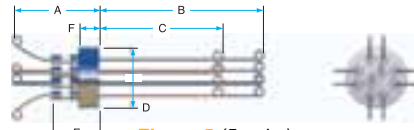


Figure 5 (5 pairs)

Figure	Air Side	Vac. Side	T/C Pairs	Dimensions (in.)						Part No.	Price
				A	B	C	D	E	F		
1	Loops	Loops	1	1.73	4.50	3.50	0.75	0.73	0.53	TFT1TN00001	Call
2	Loops	Loops	2	2.38	4.50	3.50	0.75	1.38	0.60	TFT2TN00001	Call
3	Loops	Loops	3	2.00	4.50	3.50	0.75	1.58	0.47	TFT3TN00001	Call
4	Loops	Loops	4	2.00	4.00	3.00	1.50	1.16	0.50	TFT4TN00001	Call
5	Loops	Loops	5	2.13	4.00	3.00	1.50	1.16	0.50	TFT5TN00001	Call

Refer to Connectors & Cabling, starting on page 3-113, for t/c wire, and wire beads.

■ CF Flange

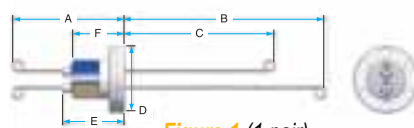


Figure 1 (1 pair)

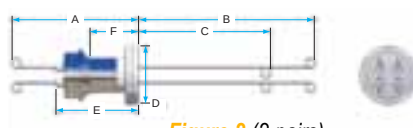


Figure 2 (2 pairs)

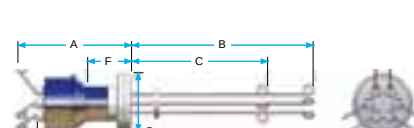


Figure 3 (3 pairs)

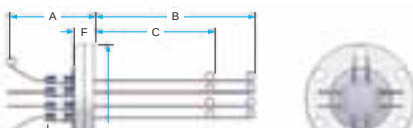


Figure 4 (4 pairs)

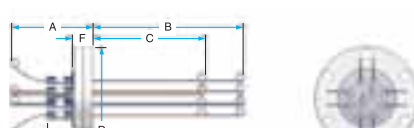


Figure 5 (5 pairs)

Figure	Air Side	Vac. Side	Flange Size	T/C Pairs	Dimensions (in.)						Part No.	Price
					A	B	C	D	E	F		
1	Loops	Loops	1.33" CF	1	2.33	4.00	3.00	1.33	1.23	1.03	TFT1TN00002	Call
1	Loops	Loops	2.75" CF	1	1.73	4.50	3.50	2.75	0.73	0.53	TFT1TN00003	Call
2	Loops	Loops	1.33" CF	2	2.88	4.00	3.00	1.33	1.88	1.10	TFT2TN00002	Call
2	Loops	Loops	2.75" CF	2	2.38	4.50	3.50	2.75	1.38	0.60	TFT2TN00003	Call
3	Loops	Loops	1.33" CF	3	2.50	4.00	3.00	1.33	2.08	0.97	TFT3TN00002	Call
3	Loops	Loops	2.75" CF	3	2.00	4.50	3.50	2.75	1.58	0.47	TFT3TN00003	Call
4	Loops	Loops	2.75" CF	4	2.00	4.00	3.00	2.75	1.16	0.50	TFT4TN00003	Call
5	Loops	Loops	2.75" CF	5	2.13	4.00	3.00	2.75	1.16	0.50	TFT5TN00003	Call

Refer to Connectors & Cabling, starting on page 3-113, for t/c wire, and wire beads.

► Type T Loops

■ KF (QF) Flange

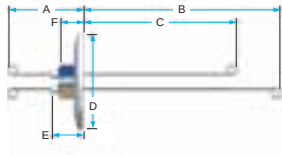


Figure 1 (1 pair)

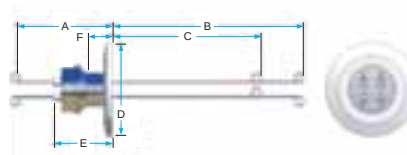


Figure 2 (2 pairs)

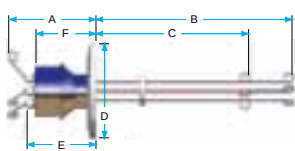


Figure 3 (3 pairs)

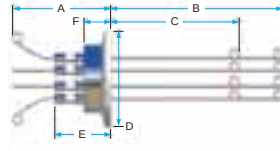


Figure 4 (4 pairs)

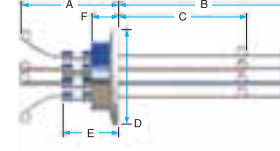


Figure 5 (5 pairs)

Figure	Air Side	Vac. Side	Flange Size	T/C Pairs	Dimensions (in.)						Part No.	Price
					A	B	C	D	E	F		
1	Loops	Loops	KF16	1	1.73	4.50	3.50	1.18	0.73	0.53	TFT1TN00008	Call
1	Loops	Loops	KF25	1	1.73	4.50	3.50	1.57	0.73	0.53	TFT1TN00008A	Call
1	Loops	Loops	KF40	1	1.73	4.50	3.50	2.16	0.73	0.53	TFT1TN00008B	Call
2	Loops	Loops	KF16	2	2.38	4.50	3.50	1.18	1.38	0.60	TFT2TN00008	Call
2	Loops	Loops	KF40	2	2.38	4.50	3.50	2.16	1.38	0.60	TFT2TN00008B	Call
2	Loops	Loops	KF50	2	2.38	4.50	3.50	2.95	1.38	0.60	TFT2TN00008C	Call
3	Loops	Loops	KF16	3	2.00	4.50	3.50	1.18	1.58	0.47	TFT3TN00008	Call
3	Loops	Loops	KF40	3	2.00	4.50	3.50	2.16	1.58	0.47	TFT3TN00008B	Call
4	Loops	Loops	KF40	4	2.00	4.00	3.00	2.16	1.16	0.50	TFT4TN00008B	Call
5	Loops	Loops	KF40	5	2.13	4.00	3.00	2.16	1.16	0.50	TFT5TN00008B	Call

Refer to Connectors & Cabling, starting on page 3-113, for t/c wire, and wire beads.

■ 1" Baseplate

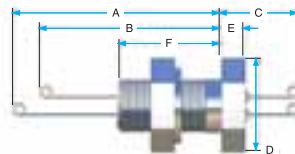


Figure 1 (1 pair)

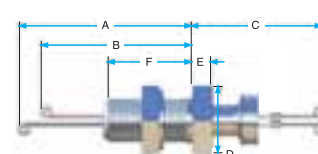


Figure 2 (2 pairs)

Figure	Air Side	Vac. Side	Mounting	T/C Pairs	Dimensions (in.)						Part No.	Price
					A	B	C	D	E	F		
1	Loops	Loops	1" BP	1	3.87	3.37	1.44	1.50	0.44	1.88	TFT1TN00004	Call
2	Loops	Loops	1" BP	2	3.88	3.38	2.95	1.50	0.44	1.88	TFT2TN00004	Call

Refer to Connectors & Cabling, starting on page 3-113, for t/c wire, and wire beads.

■ NPT (M)

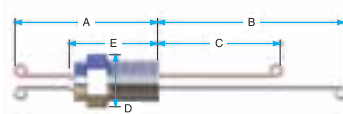


Figure 1 (1 pair)



Figure 2 (2 pairs)

Figure	Air Side	Vac. Side	Mounting	T/C Pairs	Dimensions (in.)						Part No.	Price
					A	B	C	D	E			
1	Loops	Loops	1/2" NPT	1	2.75	3.35	2.35	0.875	1.72		TFT1TN00005	Call
2	Loops	Loops	1/2" NPT	2	3.50	3.35	2.35	0.875	2.51		TFT2TN00005	Call

Refer to Connectors & Cabling, starting on page 3-113, for t/c wire, and wire beads.

➤ Thermocouple Feedthrough Probes

IN THIS SECTION ➤

Thermocouple Feedthrough Probes

- Type J, K, E, T, & N Thermocouple Styles
- Include miniature air-side connectors
- Temperature measurement junction encased in bendable metal sheath, stainless steel or Inconel® available

■ Part Numbers for Thermocouple Feedthrough Probes

Part No.	Specification	Code	Indicates
T F P	Thermocouple Feedthrough Probe	—	Air-Side Connector
x x x N	Number of T/C Probes	Number	From 1-2 Probes (Custom Configurations Available)
x x x x N	T/C Type	E J K T N	Chromel®: Constantan Fe: Constantan Chromel: Alumel® Cu/Constantan Microsil/Nisil
x x x x x N	T/C Connector Plug	Y	Miniature Style Plugs
x x x x x x NN	Sheath Material	SS IN	Stainless Steel Inconel
x x x x x x x N N	Length (in.)	12	Vacuum Side Length (Custom Lengths Available)
x x x x x x x x x N N	Termination	—	Same as Power Feedthroughs

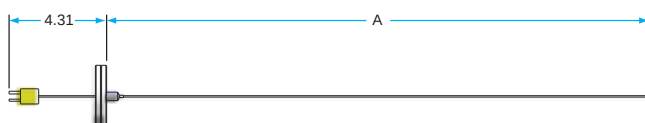


Figure 1 (Single-Probe)

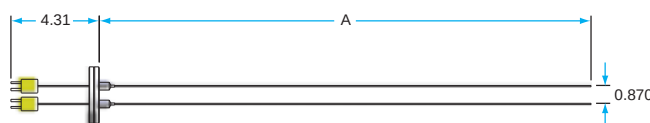


Figure 2 (Dual-Probe)

Figure	Flange Size	Type	Material	Air Side	Vac Side	Dimensions (in.) T/C Probes	A	Part No.	Price
1	2.75" CF	K	304 SST	Miniature Plug	Probe Tip	1	12	TFP1KYSS123	Call
2	2.75" CF	K	304 SST	Miniature Plug	Probe Tip	2	12	TFP2KYSS123	Call



1980

Personal Computer

Bill Gates, Paul Allen and Kay Nishi make the final decision to accept the IBM® contract to produce languages and an operating system for the new microcomputer.

Kurt J. Lesker Company became the exclusive distributor for Vacuum Generators in the United States. Vacuum Generators offered a complete line of sample manipulation and UHV Components.

► Fluid Feedthroughs: Gas/Liquid

Use the Matrix Tables below to determine available feedthrough configurations. Build your feedthrough part number and contact us at feedthroughs@lesker.com for pricing and delivery.

Feedthrough Type	Mounting Flange	# of Tubes	Tube O.D.	Vacuum-Side	Atmosphere-Side	=	Part #
LLL	NL	N	N	LL	LL		LLLNLLNLLL
Part # Type	Part # Mounting Flange	Part # # of Tubes	Part # Tubes O.D.	Part # Vacuum-Side	Part # Atmosphere-Side		Part # Atmosphere-Side
LFT Gas/Liquid	2 1 1/8" UHV	1 1	1 1/8"	TE Tube Ends	TE Tube Ends		TE Tube Ends
	3A 2 3/8" UHV	2 2	2 1/4"	MV Male VCR®	MV Male VCR		MV Male VCR
	6 3 3/8" UHV	3 3	3 3/8"	FV Female VCR	FV Female VCR		FV Female VCR
	4 4 1/2" UHV	4 4	4 1/2"	MC Male VCO®	MC Male VCO		MC Male VCO
	8 1" Baseplate		5 5/8"	FC Female VCO	FC Female VCO		FC Female VCO
	8 KF16		6 3/4"	SW Swagelok®	SW Swagelok		SW Swagelok
	8A KF25						
	8B KF40						
	8C KF50						

3

Feedthroughs

CF (ConFlat) Flanges Matrix for Gas/Liquid Feedthroughs															
			Vacuum-Side Terminations						Atmosphere-Side Terminations						
Flange	Tube #	Tube O.D.	TE	MV	FV	MC	FC	SW	TE	MV	FV	MC	FC	SW	
1 1/8" CF	1	1/8"	Y	Y	Y	—	—	Y	Y	Y	Y	Y	Y	Y	
1 1/8" CF	1	1/4"	Y	—	—	—	—	Y	Y	Y	Y	Y	Y	Y	
1 1/8" CF	1	3/8"	Y	—	—	—	—	—	Y	Y	Y	Y	Y	Y	
1 1/8" CF	2	1/8"	Y	—	—	—	—	—	Y	Y	Y	Y	Y	Y	
1 1/8" CF	2	1/4"	Y	—	—	—	—	—	Y	—	—	—	—	c	
2 3/4" CF	1	1/8"	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
2 3/4" CF	1	1/4"	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
2 3/4" CF	1	3/8"	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
2 3/4" CF	1	1/2"	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
2 3/4" CF	1	5/8"	Y	Y	a	Y	a	—	Y	Y	Y	Y	Y	—	
2 3/4" CF	1	3/4"	Y	—	—	—	—	Y	Y	Y	Y	Y	Y	Y	
2 3/4" CF	2	1/8"	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
2 3/4" CF	2	1/4"	Y	Y	a	Y	a	Y	Y	Y	Y	Y	Y	Y	
2 3/4" CF	2	3/8"	Y	—	—	—	—	b	Y	Y	Y	Y	Y	Y	
2 3/4" CF	2	1/2"	Y	—	—	—	—	—	Y	—	—	—	—	Y	
2 3/4" CF	3	1/8"	Y	a	a	—	—	a	Y	Y	Y	Y	Y	Y	
2 3/4" CF	3	1/4"	Y	—	—	—	—	—	Y	Y	Y	Y	Y	Y	
2 3/4" CF	3	3/8"	Y	—	—	—	—	—	Y	—	—	—	—	Y	
2 3/4" CF	4	1/8"	Y	—	—	—	—	b	Y	Y	Y	Y	Y	Y	

KF (QF or NW) Flanges Matrix for Gas/Liquid Feedthroughs														
			Vacuum-Side Terminations						Atmosphere-Side Terminations					
Flange	Tube #	Tube O.D.	TE	MV	FV	MC	FC	SW	TE	MV	FV	MC	FC	SW
KF16	1	1/8"	Y	Y	Y	—	—	Y	Y	Y	Y	Y	Y	Y
KF16	1	1/4"	Y	—	—	—	—	—	Y	Y	Y	Y	Y	Y
KF16	1	3/8"	Y	—	—	—	—	—	Y	Y	Y	Y	Y	Y
KF16	2	1/8"	Y	—	—	—	—	—	Y	—	—	—	—	c
KF25	1	1/8"	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
KF25	1	1/4"	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
KF25	1	3/8"	Y	—	—	—	—	Y	Y	Y	Y	Y	Y	Y
KF25	1	1/2"	Y	—	—	—	—	—	Y	Y	Y	Y	Y	Y
KF25	2	1/8"	Y	—	—	—	—	—	Y	Y	Y	Y	Y	Y
KF25	2	1/4"	Y	—	—	—	—	—	Y	—	—	—	—	Y
KF40	1	1/8"	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
KF40	1	1/4"	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
KF40	1	3/8"	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
KF40	1	1/2"	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
KF40	1	3/4"	Y	—	—	—	—	Y	Y	Y	Y	Y	Y	Y
KF40	2	1/8"	Y	Y	Y	Y	—	Y	Y	Y	Y	Y	Y	Y
KF40	2	1/4"	Y	Y	—	Y	—	Y	Y	Y	Y	Y	Y	Y
KF40	2	3/8"	Y	—	—	—	—	—	Y	c	—	c	—	Y
KF40	2	1/2"	Y	—	—	—	—	—	Y	c	—	c	—	Y
KF40	3	1/8"	Y	—	—	—	—	—	Y	Y	Y	Y	Y	Y
KF40	3	1/4"	Y	—	—	—	—	—	Y	Y	c	Y	c	Y
KF40	3	3/8"	Y	—	—	—	—	—	Y	—	—	—	—	Y
KF40	4	1/8"	Y	—	—	—	—	—	Y	Y	Y	Y	Y	Y
KF40	4	1/4"	Y	—	—	—	—	—	Y	Y	c	Y	c	Y

TE = Tube Ends; MV = VCR® (male); FV = VCR (female); MC = VCO® (male); FC = VCO (female); SW = Swagelok®; Y = Yes, termination specified fits without modification, a = Termination fits inside standard 1 1/2" O.D. tubed ports; b = Termination fits only inside 1 5/8" O.D. tubed ports; c = Termination fits only if tubes are splayed apart

► Fluid Feedthroughs: Gas/Liquid

Use the Matrix Tables below to determine available feedthrough configurations. Build your feedthrough part number and contact us at feedthroughs@lesker.com for pricing and delivery.

Feedthrough Type	Mounting Flange	# of Tubes	Tube O.D.	Vacuum-Side	Atmosphere-Side	=	Part #
LLL	NL	N	N	LL	LL		LLLNLNLLLL
Part # LFT Type Gas/Liquid	Part # Mounting Flange	Part # # of Tubes	Part # # of Tubes	Part # Tubes O.D.	Part # Vacuum-Side	Part # Atmosphere-Side	Part # Atmosphere-Side
	2 1 ¹ / ₈ " UHV	1 1	1 1 ¹ / ₈ "	TE Tube Ends	TE Tube Ends		
	3 2 ³ / ₄ " UHV	2 2	2 1 ¹ / ₄ "	MV Male VCR®	MV Male VCR		
	3A 3 ³ / ₈ " UHV	3 3	3 3 ³ / ₈ "	FV Female VCR	FV Female VCR		
	6 4 ¹ / ₂ " UHV	4 4	4 1 ¹ / ₂ "	MC Male VCO®	MC Male VCO		
	4 1" Baseplate			FC Female VCO	FC Female VCO		
	8 KF16			SW Swagelok®	SW Swagelok		
	8A KF25						
	8B KF40						
	8C KF50						

Baseplate Fittings Matrix for Gas/Liquid Feedthroughs

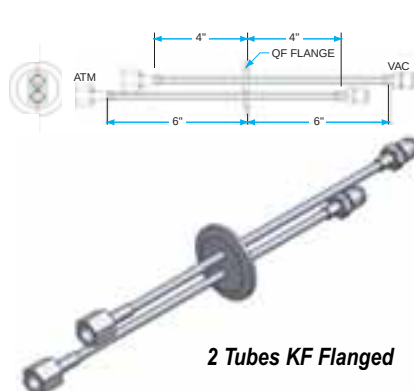
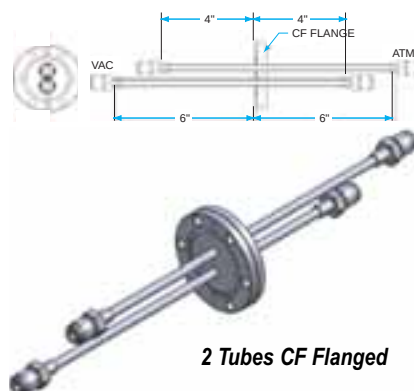
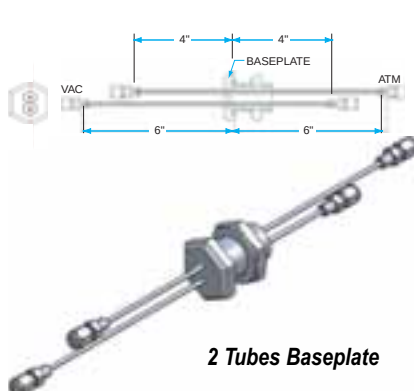
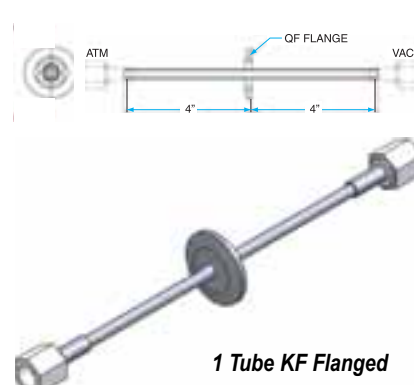
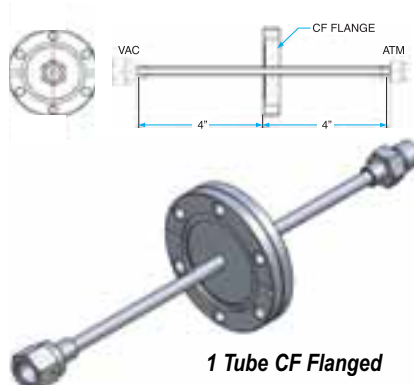
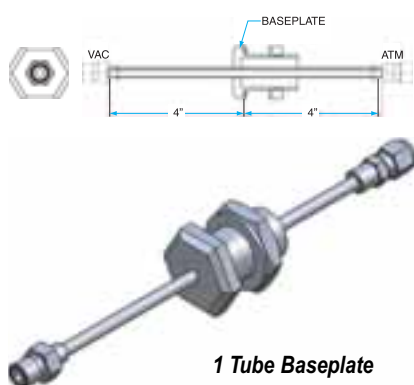
Flange	Tube #	Tube O.D.	Vacuum-Side Terminations						Atmosphere-Side Terminations					
			TE	MV	FV	MC	FC	SW	TE	MV	FV	MC	FC	SW
Baseplate	1	1 ¹ / ₈ "	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Baseplate	1	1 ¹ / ₄ "	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Baseplate	1	3 ³ / ₈ "	Y	Y	Y	Y	Y	Y	Y	—	—	—	—	Y
Baseplate	1	1 ¹ / ₂ "	Y	Y	Y	Y	Y	Y	Y	—	—	—	—	—
Baseplate	1	5 ⁵ / ₈ "	Y	—	—	—	—	—	Y	—	—	—	—	—
Baseplate	1	3 ³ / ₄ "	Y	Y	Y	Y	Y	Y	Y	—	—	—	—	—
Baseplate	2	1 ¹ / ₈ "	Y	Y	Y	Y	Y	Y	Y	Y	Y	—	—	Y
Baseplate	2	1 ¹ / ₄ "	Y	c	c	c	c	c	Y	—	—	—	—	—
Baseplate	2	3 ³ / ₈ "	Y	—	—	—	—	c	Y	—	—	—	—	—
Baseplate	3	1 ¹ / ₈ "	Y	—	—	—	—	—	Y	—	—	—	—	—

TE = Tube Ends; MV = VCR® (male); FV = VCR (female); MC = VCO® (male); FC = VCO (female); SW = Swagelok®; Y = Yes, termination specified fits without modification, a = Termination fits inside standard 1¹/₂" O.D. tubed ports; b = Termination fits only inside 1⁵/₈" O.D. tubed ports; c = Termination fits only if tubes are splayed apart

Example Part Number & Description for GAS/LIQUID: LFT321FCMC

2³/₄" CF Flanged Gas/Liquid Feedthrough with two 1¹/₈" O.D. Tubes using Female VCO vacuum-side and Male VCO atmosphere-side terminations.

Sample Feedthroughs



➤ Fluid Feedthroughs: LN₂

Use the Matrix Tables below to determine available feedthrough configurations. Build your feedthrough part number and contact us at feedthroughs@lesker.com for pricing and delivery.

Feedthrough Type	Mounting Flange	# of Tubes	Tube O.D.	Vacuum-Side	Atmosphere-Side	=	Part #
LLLL	NL	N	N	LL	LL		LLLLNLNNLLLL
Part # LNFT Type Gas/Liquid	Part # Mounting Flange	Part # # of Tubes	Part # Tubes O.D.	Part # Vacuum-Side	Part # Atmosphere-Side		Part # Atmosphere-Side
	2 1 1/8" UHV	1 1	1 1/8"	1 TE Tube Ends	TE Tube Ends		TE Tube Ends
	3 2 3/4" UHV	2 2	2 1/4"	2 MV Male VCR®	MV Male VCR		MV Male VCR
	3A 3 3/8" UHV	3 3	3 3/8"	3 FV Female VCR	FV Female VCR		FV Female VCR
	6 4 1/2" UHV	4 4	4 1/2"	4 MC Male VCO®	MC Male VCO		MC Male VCO
	4 1" Baseplate		5 5/8"	5 FC Female VCO	FC Female VCO		FC Female VCO
	8 KF16		6 3/4"	6 SW Swagelok®	SW Swagelok		SW Swagelok
	8A KF25						
	8B KF40						
	8C KF50						

CF (ConFlat) Flanges Matrix for LN₂ Feedthroughs

Flange	Tube #	Tube O.D.	Vacuum-Side Terminations						Atmosphere-Side Terminations					
			TE	MV	FV	MC	FC	SW	TE	MV	FV	MC	FC	SW
1 1/8" CF	1	1/8"	Y	Y	Y	—	—	Y	Y	Y	Y	Y	Y	Y
1 1/8" CF	1	1/4"	Y	—	—	—	—	Y	Y	Y	Y	Y	Y	Y
1 1/8" CF	1	3/8"	Y	—	—	—	—	—	Y	Y	Y	Y	Y	Y
1 1/8" CF	2	1/8"	Y	—	—	—	—	—	Y	Y	Y	Y	Y	Y
2 3/4" CF	1	1/8"	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
2 3/4" CF	1	1/4"	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
2 3/4" CF	1	3/8"	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
2 3/4" CF	1	1/2"	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
2 3/4" CF	1	3/4"	Y	—	—	—	—	Y	Y	Y	Y	Y	Y	Y
2 3/4" CF	2	1/8"	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
2 3/4" CF	2	1/4"	Y	Y	a	Y	a	Y	Y	Y	Y	Y	Y	Y
2 3/4" CF	2	3/8"	Y	—	—	—	—	Y	Y	Y	Y	Y	Y	Y
2 3/4" CF	2	1/2"	Y	—	—	—	—	—	Y	—	—	—	—	Y
2 3/4" CF	3	1/8"	Y	—	—	—	—	a	Y	Y	Y	Y	Y	Y
2 3/4" CF	4	1/8"	Y	—	—	—	—	b	Y	Y	Y	Y	Y	Y
2 3/4" CF	4	1/4"	b	—	—	—	—	—	Y	Y	Y	Y	Y	Y

KF (QF or NW) Flanges Matrix for LN₂ Feedthroughs

Flange	Tube #	Tube O.D.	Vacuum-Side Terminations						Atmosphere-Side Terminations					
			TE	MV	FV	MC	FC	SW	TE	MV	FV	MC	FC	SW
KF16	1	1/8"	Y	Y	Y	—	—	Y	Y	Y	Y	Y	Y	Y
KF16	1	1/4"	Y	—	—	—	—	—	Y	—	—	Y	Y	Y
KF16	1	3/8"	Y	—	—	—	—	—	Y	—	—	Y	Y	Y
KF25	1	1/8"	Y	—	—	Y	Y	Y	Y	—	—	Y	Y	Y
KF25	1	1/4"	Y	—	—	Y	Y	Y	Y	—	—	Y	Y	Y
KF25	1	3/8"	Y	—	—	—	—	Y	Y	—	—	Y	Y	Y
KF25	1	1/2"	Y	—	—	—	—	—	Y	—	—	Y	Y	Y
KF25	1	5/8"	Y	—	—	—	—	—	Y	—	—	Y	Y	Y
KF25	1	3/4"	Y	—	—	—	—	—	Y	—	—	Y	Y	Y
KF25	2	1/8"	Y	—	—	—	—	—	Y	—	—	Y	Y	Y
KF25	2	1/4"	Y	—	—	—	—	—	Y	—	—	-	-	Y
KF25	3	1/8"	Y	—	—	Y	Y	Y	Y	—	—	Y	Y	Y
KF25	3	1/4"	Y	—	—	—	—	—	Y	—	—	—	—	—
KF40	1	1/8"	Y	—	—	Y	Y	Y	Y	—	—	Y	Y	Y
KF40	1	1/4"	Y	—	—	Y	Y	Y	Y	—	—	Y	Y	Y
KF40	1	3/8"	Y	—	—	Y	Y	Y	Y	—	—	Y	Y	Y
KF40	1	1/2"	Y	—	—	Y	Y	Y	Y	—	—	Y	Y	Y
KF40	1	5/8"	Y	—	—	Y	Y	—	Y	—	—	Y	Y	—
KF40	1	3/4"	Y	—	—	Y	Y	Y	Y	—	—	Y	Y	Y
KF40	2	1/8"	Y	Y	Y	Y	—	—	Y	Y	Y	Y	—	—
KF40	2	1/4"	Y	Y	—	Y	—	—	Y	Y	Y	Y	—	—
KF40	2	3/8"	Y	—	—	—	—	—	Y	—	—	Y	—	—
KF40	2	1/2"	Y	—	—	—	—	—	Y	—	—	Y	—	—
KF40	3	1/8"	Y	—	—	—	—	—	Y	Y	Y	Y	—	—
KF40	3	1/4"	Y	—	—	—	—	—	Y	Y	Y	Y	—	—
KF40	3	3/8"	Y	—	—	—	—	—	Y	—	—	Y	—	—
KF40	3	1/2"	Y	—	—	—	—	—	Y	Y	Y	Y	—	—
KF40	4	1/8"	Y	—	—	—	—	—	Y	Y	Y	Y	—	—
KF40	4	1/4"	Y	—	—	—	—	—	Y	Y	Y	Y	—	—

TE = Tube Ends; MV = VCR® (male); FV = VCR (female); MC = VCO® (male); FC = VCO (female); SW = Swagelok®; Y = Yes, termination specified fits without modification; a = Termination fits inside standard 1 1/2" O.D. tubed ports; b = Termination fits only inside 1 5/8" O.D. tubed ports; c = Termination fits only if tubes are splayed apart

Fluid Feedthroughs: LN₂

Use the Matrix Tables below to determine available feedthrough configurations. Build your feedthrough part number and contact us at feedthroughs@lesker.com for pricing and delivery.

Feedthrough Type	Mounting Flange	# of Tubes	Tube O.D.	Vacuum-Side	Atmosphere-Side	=	Part #
LLLL	NL	N	N	LL	LL		LLLLNLNNLLLL
Part # LNFT Type Gas/Liquid	Part # Mounting Flange	Part # # of Tubes	Part # # of Tubes	Part # Tubes O.D.	Part # Vacuum-Side	Part # Atmosphere-Side	
	2 1 1/8" UHV	1 1	1 1/8"	TE Tube Ends	TE Tube Ends		
	3 2 3/8" UHV	2 2	2 1/4"	MV Male VCR®	MV Male VCR		
	3A 3 3/8" UHV	3 3	3 3/8"	FV Female VCR	FV Female VCR		
	6 4 1/2" UHV	4 4	4 1/2"	MC Male VCO®	MC Male VCO		
	4 1" Baseplate			FC Female VCO	FC Female VCO		
	8 KF16			SW Swagelok®	SW Swagelok		
	8A KF25						
	8B KF40						
	8C KF50						

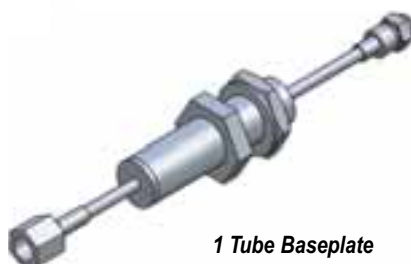
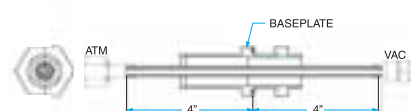
Baseplate Fittings Matrix for LN ₂ Feedthroughs															
			Vacuum-Side Terminations							Atmosphere-Side Terminations					
Flange	Tube #	Tube O.D.	TE	MV	FV	MC	FC	SW		TE	MV	FV	MC	FC	SW
Baseplate	1	1/4"	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y
Baseplate	1	3/8"	Y	—	—	—	—	Y		Y	—	—	—	—	Y
Baseplate	1	1/2"	Y	—	—	—	—	—		Y	—	—	—	—	Y
Baseplate	1	5/8"	Y	—	—	—	—	—		Y	—	—	—	—	—
Baseplate	1	3/4"	Y	—	—	—	—	—		Y	—	—	—	—	—
Baseplate	2	1/4"	Y	—	—	—	—	—		Y	—	—	—	—	—
Baseplate	2	3/8"	Y	—	—	—	—	—		Y	—	—	—	—	—

TE = Tube Ends; MV = VCR® (male); FV = VCR (female); MC = VCO® (male); FC = VCO (female); SW = Swagelok®; Y = Yes, termination specified fits without modification; a = Termination fits inside standard 1 1/2" O.D. tubed ports; b = Termination fits only inside 1 5/8" O.D. tubed ports; c = Termination fits only if tubes are splayed apart

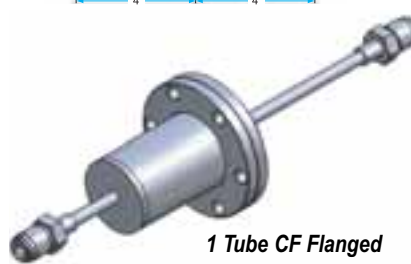
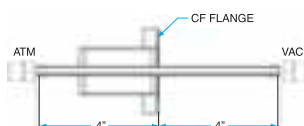
Example Part Number & Description for LN₂: LNFT8A13SWSW

KF25 Flanged LN2 Feedthrough with one 3/8" O.D. Tube using Swagelok vacuum-side and Swagelok atmosphere-side terminations.

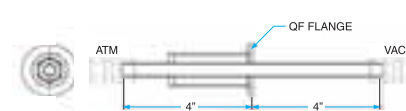
Sample Feedthroughs



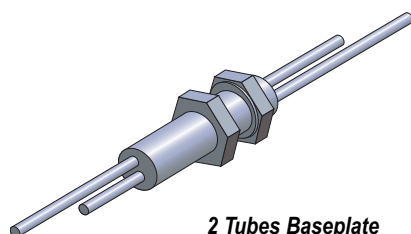
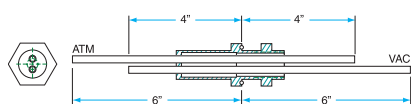
1 Tube Baseplate



1 Tube CF Flanged



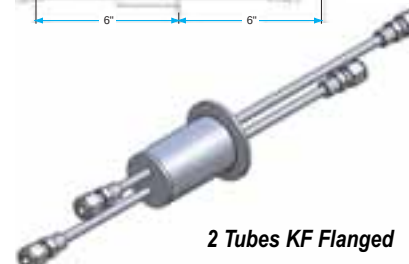
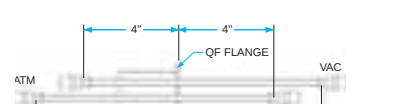
1 Tube KF Flanged



2 Tubes Baseplate



2 Tubes CF Flanged



2 Tubes KF Flanged

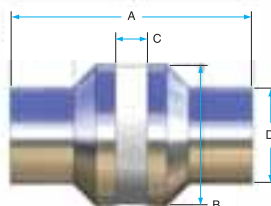
➤ Vacuum Breaks

IN THIS SECTION ➤

Ceramic Breaks—Vacuum

- Designed and rated for high vacuum and UHV applications
- Constructed of vacuum-grade materials, including high-purity alumina ceramic insulation, 304 stainless steel or low-expansion Kovar® weldable lips, and vacuum tube-grade braze alloys
- Available in tube sizes ranging from 1/2" to 8" nominal diameters
- Larger-diameter assemblies have tapered seals to minimize stress caused by differential expansion during thermal cycling

■ Weldable

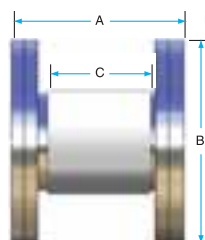


3

Feedthroughs

Voltage	Weldable Material	Dimensions (in.)				Part Number	Price
		A	B	C	D		
3kV	Stainless Steel	2.20	1.66	0.25	1.500	CFT03V1501	Call
5kV	Kovar	1.90	1.70	0.16	1.250	CFT05V1251	Call
8kV	Kovar	3.63	3.23	0.75	2.370	CFT08V2371	Call
8kV	Kovar	3.57	4.25	0.75	3.810	CFT08V3811	Call
10kV	Stainless Steel	1.55	0.65	0.75	0.508	CFT10V0511	Call
10kV	Stainless Steel	2.62	1.04	1.00	0.750	CFT10V0751	Call
15kV	Stainless Steel	3.80	1.66	2.00	1.500	CFT15V1501	Call
15kV	Kovar	4.50	6.92	1.50	6.080	CFT15V6081	Call
15kV	Kovar	4.64	8.80	1.50	7.830	CFT15V7831	Call
20kV	Stainless Steel	2.58	1.40	1.50	1.200	CFT20V1201	Call
20kV	Kovar	3.70	4.90	0.90	4.000	CFT20V4001	Call
35kV	Stainless Steel	3.80	1.70	2.00	1.250	CFT35V1251	Call
40kV	Kovar	3.40	2.50	2.00	2.375	CFT40V2381	Call
60kV	Kovar	4.40	3.00	3.00	2.800	CFT60V2801	Call
60kV	Kovar	6.50	4.90	3.65	4.000	CFT60V4001	Call
65kV	Kovar	5.70	1.70	3.90	1.250	CFT65V1251	Call

■ CF Flanges

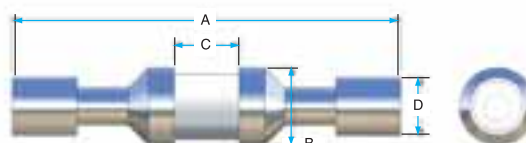


Termination	Voltage	Weldable Material	Dimensions (in.)			Part Number	Price
			A	B	C		
1.33" CF	3kV	Stainless Steel	2.65	1.33	0.25	CFT03V1503	Call
1.33" CF	10kV	Stainless Steel	1.84	1.33	0.75	CFT10V0512	Call
1.33" CF	10kV	Stainless Steel	3.62	1.33	1.00	CFT10V0752	Call
10" CF	15kV	Kovar	5.75	10.00	1.50	CFT15V7836C	Call
2.75" CF	5kV	Kovar	2.30	2.75	0.16	CFT05V1253	Call
2.75" CF	15kV	Stainless Steel	4.20	2.75	2.00	CFT15V1503	Call
2.75" CF	20kV	Stainless Steel	3.00	2.75	1.50	CFT20V1203	Call
2.75" CF	35kV	Stainless Steel	4.20	2.75	2.00	CFT35V1253	Call
2.75" CF	65kV	Kovar	6.10	2.75	3.90	CFT65V1253	Call
4.5" CF	8kV	Kovar	4.50	4.50	0.75	CFT08V2376	Call
4.5" CF	40kV	Kovar	4.20	4.50	2.00	CFT40V2386	Call
6" CF	8kV	Kovar	4.62	6.00	0.75	CFT08V3816A	Call
6" CF	20kV	Kovar	4.60	6.00	0.90	CFT20V4006A	Call
6" CF	60kV	Kovar	5.20	6.00	3.00	CFT60V2806A	Call
8" CF	30kV	Kovar	5.50	8.00	1.50	CFT30V6016B	Call

➤ Water & Cryogenics

■ Ceramic Breaks—Water

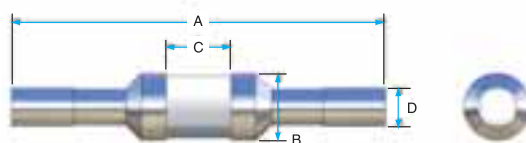
- Insulate electrical lines in applications with non-cryogenic coolant lines
- Designed for high vacuum and UHV applications
- Constructed with vacuum-grade materials, including OFHC® copper weldable lips, high-purity alumina ceramic insulation, and vacuum tube-grade braze alloys
- OFHC copper weldable lips can be welded or brazed to copper or stainless steel cooling lines
- Available in 1/4", 3/8", and 1/2" tube sizes



Braze Lip Material	Voltage	Tube Socket (in.)	Dimensions (in.)				Part Number	Price
			A	B	C	D		
Copper	5kV	1/4	3	0.59	0.50	0.32	CFT05W0321	Call
Copper	5kV	3/8	3	0.59	0.50	0.44	CFT05W0441	Call
Copper	5kV	1/2	3	0.74	0.50	0.59	CFT05W0591	Call

■ Ceramic Breaks—Cryogenic

- Provide electrical insulation in applications with liquid nitrogen
- Rated for high vacuum and UHV applications
- Constructed with vacuum-grade materials, including 304 stainless steel weldable lips, high-purity alumina ceramic insulation and vacuum tube-grade braze alloys
- A flexible seal design and the use of an expansion alloy that has a low thermal coefficient of expansion enables for operation at cryogenic temperatures to -200° C
- Available in 1/8", 1/4", and 3/8" tube sizes

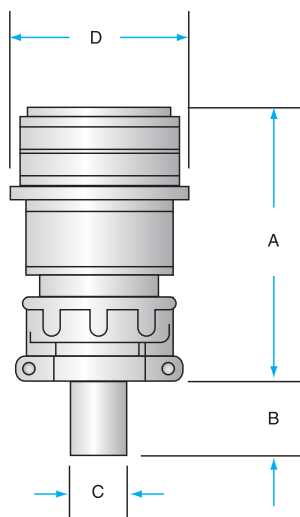


Voltage	Weld Lip Material	Ends	Dimensions (in.)				Part Number	Price
			A	B	C	D		
3kV	Stainless Steel	1/8" Tube End	1.80	0.312	0.30	0.125	CFT03C0121	Call
6kV	Stainless Steel	1/4" Tube End	3.00	0.54	0.67	0.25	CFT06C0251	Call
6kV	Stainless Steel	1/4" Socket Weld	3.00	0.54	0.67	0.31	CFT06C0311	Call
6kV	Stainless Steel	3/8" Tube End	3.00	0.79	0.67	0.38	CFT06C0371	Call
13kV	Stainless Steel	1/4" Tube End	3.00	0.57	0.57	0.25	CFT13C0251	Call
13kV	Stainless Steel	3/8" Socket Weld	3.00	0.79	0.52	0.437	CFT13C0441	Call

➤ Connectors

■ Mil-Spec Multi-Pin Thermocouple

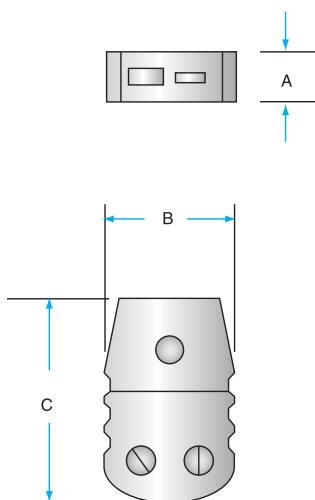
- MS number indicates an approved part under current military specifications
- MS-3106A models are solid-shell, straight-threaded connectors with polarized keyways
- Air-side service to 125° C
- Includes thermocouple crimp contacts



T/C Type	Dimensions (in.)				Part No.	Price
	A	B	C	D		
E	2.60	1.70	0.56	1.35	FTAAMPH02EMS	Call
J	2.60	1.70	0.56	1.35	FTAAMPH02JMS	Call
K	2.60	1.70	0.56	1.35	FTAAMPH02KMS	Call
E	2.60	1.70	0.56	1.35	FTAAMPH03EMS	Call
J	2.60	1.70	0.56	1.35	FTAAMPH03JMS	Call
K	2.60	1.70	0.56	1.35	FTAAMPH03KMS	Call
E	2.60	1.70	0.56	1.35	FTAAMPH05EMS	Call
J	2.60	1.70	0.56	1.35	FTAAMPH05JMS	Call
K	2.60	1.70	0.56	1.35	FTAAMPH05KMS	Call
E	2.90	1.40	0.75	1.97	FTAAMPH10EMS	Call
J	2.90	1.40	0.75	1.97	FTAAMPH10JMS	Call
K	2.90	1.40	0.75	1.97	FTAAMPH10KMS	Call

■ Thermocouple Miniature Connectors

- Made to industry standard and color-coded per ANSI specifications
- Available for Types C (non-ANSI), E, J, and K thermocouple applications
- Type C connectors are constructed using compensating-grade alloy for contact materials



NOTE: We recommend these connectors for use with insulated fine-gauge thermocouple wire.

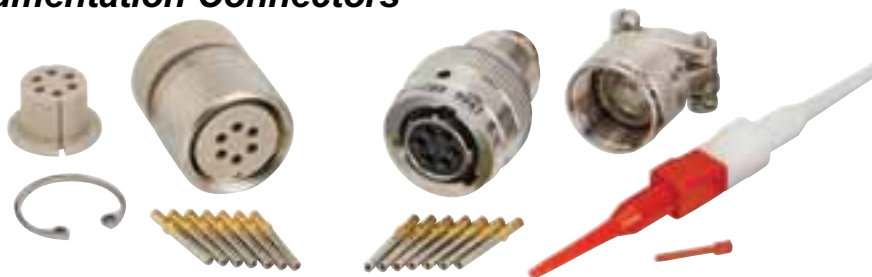
T/C Type	Dimensions (in.)			Part No.	Price
	A	B	C		
C	0.38	0.75	1.13	FTAMINC	Call
E	0.38	0.75	1.13	FTAMINE	Call
J	0.38	0.75	1.13	FTAMINJ	Call
K	0.38	0.75	1.13	FTAMINK	Call

➤ Connectors

■ Multi-Pin MPC Instrumentation Connectors

- Fit MPC instrumentation feedthroughs

NOTE: Each MPC Feedthrough ordered from KJLC® requires the necessary connectors sold in this chart. Connectors for the MPC feedthroughs must be ordered separately, they are not included with the feedthrough.



Connection Side	# of Pins	Connector Diameter (in.)	Connector Length (in.)	Crimp or Solder	Part No.	Price
Air	10	1.0	1.9	Crimp	FTACIR10AC	Call
Air	10	1.0	1.9	Solder	FTACIR10AS	Call
Vacuum	10	1.0	1.0	Crimp	FTACIR10V	Call
Air	19	1.2	1.9	Crimp	FTACIR19AC	Call
Air	19	1.2	1.9	Solder	FTACIR19AS	Call
Vacuum	19	1.1	1.0	Crimp	FTACIR19V	Call
Air	32	1.4	2.1	Crimp	FTACIR32AC	Call
Air	32	1.4	2.1	Solder	FTACIR32AS	Call
Vacuum	32	1.4	1.0	Crimp	FTACIR32V	Call
Air	3	0.8	1.9	Crimp	FTACIR3AC	Call
Air	3	0.8	1.9	Solder	FTACIR3AS	Call
Vacuum	3	0.8	1.0	Crimp	FTACIR3V	Call
Air	41	1.5	2.3	Crimp	FTACIR41AC	Call
Air	41	1.5	2.3	Solder	FTACIR41AS	Call
Vacuum	41	1.5	1.0	Crimp	FTACIR41V	Call
Air	6	1.0	1.9	Crimp	FTACIR6AC	Call
Air	6	1.0	1.9	Solder	FTACIR6AS	Call
Vacuum	6	0.9	1.0	Crimp	FTACIR6V	Call
Spare crimp contacts, sold 5/pack					FTACIRCONTV	Call

■ Mil-Spec Multi-Pin Instrumentation Connectors

- Fit multi-pin instrumentation feedthroughs
- MS number indicates an approved part under current military specifications
- MS-3106A models are solid-shell, straight-threaded connectors with polarized keyways
- Silver-plated contacts have pre-tinned solder pockets

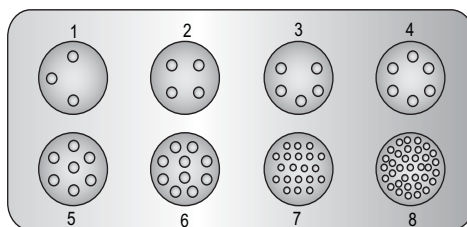
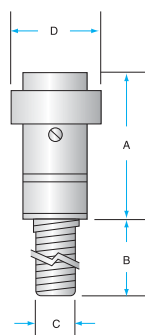


Figure (end view #)	Voltage	Amps	# of Pins	Pin Size	Similar to Mil-Spec Type	Dimensions (in.)				Part No.	Price
2	1250	13.0	4	0.06	MS-3106A-18-4S	2.60	1.70	0.56	1.35	FTAAMPH04MS	Call
4	700	13.0	6	0.06	MS-3106A-18-12S	2.60	1.70	0.56	1.35	FTAAMPH06MS	Call
6	700	13.0	10	0.06	MS-3106A-18-1S	2.60	1.80	0.56	1.35	FTAAMPH10MS	Call
7	700	13.0	20	0.06	MS-3106A-28-16S	2.90	1.40	0.75	1.97	FTAAMPH20MS	Call
8	700	13.0	35	0.06	MS-3106A-36-15S	3.00	1.30	1.25	2.47	FTAAMPH35MS	Call
1	500	3.5	3	—	—	1.40	0.90	0.26	0.70	FTAAMPH03	Call
3	500	3.5	5	—	—	1.40	0.90	0.28	0.90	FTAAMPH05	Call
5	500	3.5	7	—	—	1.40	0.90	0.28	0.90	FTAAMPH07	Call

➤ Connectors

■ Coaxial Connectors

- Available in bayonet, threaded, and snap-on styles
- Rated from 500V to 20,000V
- Most connectors use Teflon® as the standard dielectric material



3

Feedthroughs

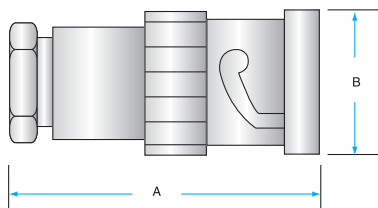


Figure 1

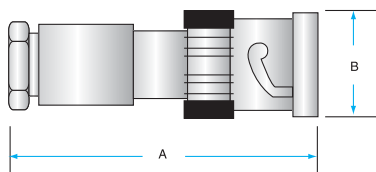


Figure 2

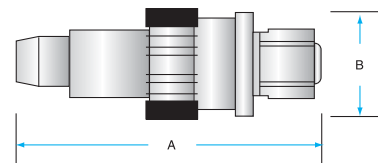


Figure 3

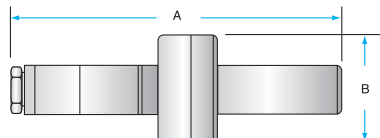


Figure 4

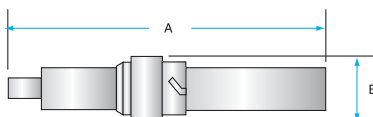


Figure 5

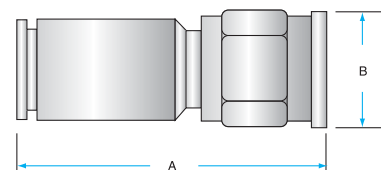


Figure 6

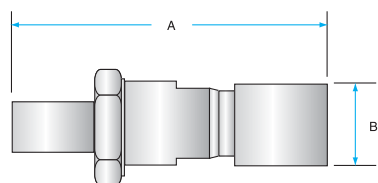


Figure 7

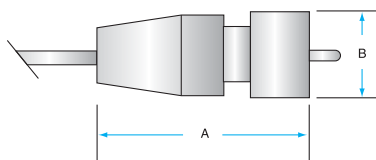


Figure 8

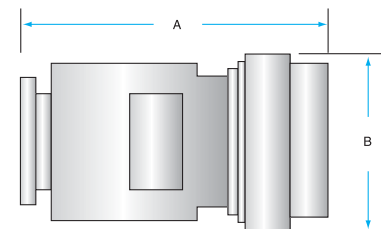


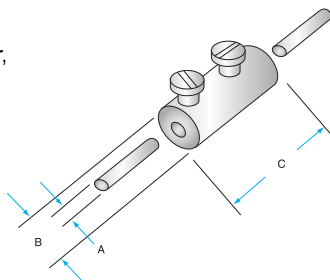
Figure 9

Figure	Type	Volts	MS #	Use Cable	Dimensions (in.)		Part No.	Price
					A	B		
1	BNC	500	UG-88U	RG-58U	0.97	0.58	FTABNC	Call
2	MHV	5,000	UG-932	RG-59U	1.60	0.58	FTAMHV	Call
3	SHV-5	5,000	—	RG-59U	1.81	0.57	FTASHV-5	Call
4	SHV-B	7,500	—	RG-59U	3.50	0.90	FTASHV-B	Call
5	SHV-20	20,000	—	RG-213U	4.60	0.77	FTASHV-20	Call
6	SMA	700	—	RG-55U	0.95	0.31	FTASMA	Call
7	SMB	500	—	RG-174U	1.00	0.26	FTASMB	Call
8	MICRO	500	—	RG-405U	0.745	0.23	FTAMICRO	Call
9	N	1,500	UG-21D/U	RG-8U	1.40	0.80	FTAN	Call

Connectors

Be/Cu Inline Barrel Connectors

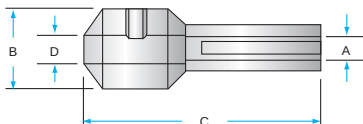
- Made of beryllium copper with two cross-screws to hold wires in place
- Enable insertion of wire at both ends
- Beryllium copper—stronger than standard copper, enabling trouble-free tightening



Current (A)	Dimensions (in.)			Per Pkg.	Part No.	Price
	A: Wire Size	B: Diameter	C: Length			
10	0.041	0.125	0.50	10	FTAIBC041	Call
15	0.058	0.188	0.50	10	FTAIBC058	Call
20	0.072	0.188	0.50	10	FTAIBC072	Call
25	0.094	0.250	0.56	10	FTAIBC094	Call
25	0.120	0.250	0.56	10	FTAIBC120	Call
30	0.134	0.250	0.63	10	FTAIBC134	Call
100	0.260	0.500	1.00	10	FTAIBC260	Call

Set-Screw Connectors

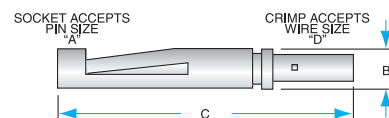
- Made of beryllium copper
- Accept wires of 0.050" width at one end
- Other end (A in diagram) features a push-on connector for pins of various diameters



Type	Material	Dimensions (in.)				Qty./Pkg.	Part No.	Price
		A	B	C	D			
Set-Screw	BeCu	0.040	0.250	0.69	0.050	10	FTASSC040	Call
Set-Screw	BeCu	0.050	0.250	0.69	0.050	10	FTASSC050	Call
Set-Screw	BeCu	0.094	0.250	0.69	0.050	10	FTASSC094	Call

Crimp-Solder and Thermocouple Crimp Connectors

- Available in beryllium copper, alumel, chromel, Constantan, and iron
- Enable for entry of different sizes of wire at the spring-style end (A in the diagram)

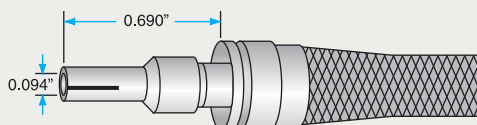


Type	Material	Dimensions (in.)				Qty./Pkg.	Part No.	Price
		A	B	C	D			
Crimp/Solder	BeCu	0.032	0.062	0.62	0.032	10	FTAPC032	Call
Crimp/Solder	BeCu	0.050	0.100	0.62	0.062	10	FTAPC050	Call
Crimp/Solder	BeCu	0.056	0.100	0.62	0.062	10	FTAPC056	Call
Crimp/Solder	BeCu	0.062	0.100	0.62	0.062	10	FTAPC062	Call
T/C Crimp	Alumel®	0.062	0.125	1.32	0.050	5	FTATC062A	Call
T/C Crimp	Chromel®	0.062	0.125	1.32	0.050	5	FTATC062C	Call
T/C Crimp	Constantan	0.062	0.125	1.32	0.050	5	FTATC062CO	Call
T/C Crimp	Iron	0.062	0.125	1.32	0.050	5	FTATC062I	Call
T/C Crimp	Alumel	0.056	0.125	1.05	0.045	5	FTATC056A	Call
T/C Crimp	Chromel	0.056	0.125	1.05	0.045	5	FTATC056C	Call
T/C Crimp	Constantan	0.056	0.125	1.05	0.045	5	FTATC056CO	Call
T/C Crimp	Nickel	0.056	0.125	1.05	0.045	5	FTATC056NI	Call

Electrical Cable Terminations

■ Termination B—Contact Style

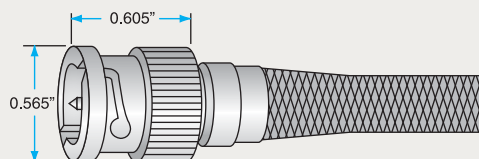
- Basic cable terminations feature push-on contacts for single-end 0.094" diameter conductor pins
- Ideal for quick-connect applications where non-continuous coaxial shielding* is acceptable
- Spring retention design limits the temperature rating to 200° C



■ Terminations E & F — BNC/MHV

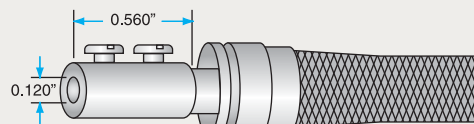
- High-temperature versions of the traditional bayonet naval connection, 400° C
- Connect double-ended BNC or MHV coaxial feedthroughs mounted in the vacuum wall to any vacuum component fitted with a female BNC or MHV connector
- Use where continuous coaxially shielded** applications are required

NOTE: Do not cross-mate BNC and MHV components



■ Termination C — In-Line Style

- Used for non-continuous coaxially shielded* applications
- Mechanical screw clamping design
- Temperature rating of 400° C

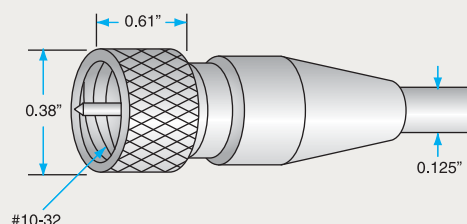


■ Termination M — Microdot

- Coaxial
- Designed for use with Between Series

BNC-Microdot Feedthroughs

NOTE: These cables must be shielded when used in vacuum coating applications. Failure to do so will lead to electrical degradation and eventual failure.



*Non-continuous coaxial shielding: The ground of the coaxial assembly has a break in electrical continuity from the assembly to the earth ground plane.

**Continuous coaxial shielding: The ground shield of the coaxial assembly has no breaks in electrical continuity from the assembly to the earth ground plane.

■ 1/8" Vacuum Connector Cables

- Constructed with vacuum-grade materials and components, including stainless steel braided shielding, high-purity alumina ceramic insulation, beryllium copper contacts, and aluminum terminations

End 1— End 2*	Max. Temp.	Overall Length	Part No.	Price
B-B	200° C	12"	FTACBL12BB12	Call
B-B	200° C	24"	FTACBL12BB24	Call
B-B	200° C	36"	FTACBL12BB36	Call
B-C	200° C	12"	FTACBL12BC12	Call
B-C	200° C	24"	FTACBL12BC24	Call
B-C	200° C	36"	FTACBL12BC36	Call
C-C	400° C	12"	FTACBL12CC12	Call
C-C	400° C	24"	FTACBL12CC24	Call
C-C	400° C	36"	FTACBL12CC36	Call
M-M	400° C	12"	FTACBL12MM12	Call
M-M	400° C	24"	FTACBL12MM24	Call
M-M	400° C	36"	FTACBL12MM36	Call

*See Electrical Cable Terminations

■ 1/4" Vacuum Connector Cables

- Suitable for high temperatures
- Rated for high vacuum and UHV applications
- Voltage to 3kV
- Current to 15A

End 1— End 2*	Max. Temp.	Overall Length	Part No.	Price
B-B	200° C	12"	FTACBL25BB12	Call
B-B	200° C	24"	FTACBL25BB24	Call
B-B	200° C	36"	FTACBL25BB36	Call
B-C	200° C	12"	FTACBL25BC12	Call
B-C	200° C	24"	FTACBL25BC24	Call
B-C	200° C	36"	FTACBL25BC36	Call
C-C	400° C	12"	FTACBL25CC12	Call
C-C	400° C	24"	FTACBL25CC24	Call
C-C	400° C	36"	FTACBL25CC36	Call
E-E	400° C	12"	FTACBL25EE12	Call
E-E	400° C	24"	FTACBL25EE24	Call
E-E	400° C	36"	FTACBL25EE36	Call
F-F	400° C	12"	FTACBL25FF12	Call
F-F	400° C	24"	FTACBL25FF24	Call
F-F	400° C	36"	FTACBL25FF36	Call

➤ **MPDT Accessories**■ **Accessories for MPDT Sub D-Type Feedthroughs**3
Feedthroughs

Description	Part No.	Price
9-Pin Vac Side PEEK Connector (inc. contacts)	FTADD09	Call
9-Pin Atm Side Connector (inc. contacts)	FTADD09A	Call
9-Pin Adapter, Atm Side, Female-Female	FTADD09ADA	Call
9-Pin Vac Side Ceramic Connector (inc. contacts)	FTADD09C	Call
15-Pin Vac Side PEEK Connector (inc. contacts)	FTADD15	Call
15-Pin Atm Side Connector (inc. contacts)	FTADD15A	Call
15-Pin Adapter, Atm Side, Female-Female	FTADD15ADA	Call
15-Pin Vac Side Ceramic Connector (inc. contacts)	FTADD15C	Call
25-Pin Vac Side PEEK Connector (inc. contacts)	FTADD25	Call
25-Pin Atm Side Connector (inc. contacts)	FTADD25A	Call
25-Pin Adapter, Atm Side, Female-Female	FTADD25ADA	Call
25-Pin Vac Side Ceramic Connector (inc. contacts)	FTADD25C	Call
25-Pin Vac Side Ceramic Connector, Small Version (inc. contacts)	FTADD25CS	Call
25-Pin Vac Side PEEK Connector, Small Version (inc. contacts)	FTADD25PS	Call
37-Pin Vac Side PEEK Connector (inc. contacts)	FTADD37	Call
37-Pin Atm Side Connector (inc. contacts)	FTADD37A	Call
37-Pin Vac Side Ceramic Connector (inc. contacts)	FTADD37C	Call
50-Pin Vac Side PEEK Connector (inc. contacts)	FTADD50	Call
50-Pin Atm Side Connector (inc. contacts)	FTADD50A	Call
50-Pin Adapter, Atm Side, Female-Female	FTADD50ADA	Call
50-Pin Vac Side Ceramic Connector (inc. contacts)	FTADD50C	Call

Description	Part No.	Price
Vacuum Side Contacts, 10/Pk	FTADPEEK-10	Call
Vacuum Side Contacts, 25/Pk	FTADPEEK-25	Call
Kapton® Ribbon Cable, 10 Wires x 1 m Long	FTAK101000	Call
Kapton Ribbon Cable, 15 Wires x 1 m Long	FTAK151000	Call
Kapton Ribbon Cable, 25 Wires x 1 m Long	FTAK251000	Call
Kapton Ribbon Cable, 9-Pin, PEEK Connector One Side, 12" Long	FTAK0912P	Call
Kapton Ribbon Cable, 9-Pin, PEEK Connector Both Sides, 12" Long	FTAK0912PP	Call
Kapton Ribbon Cable, 15-Pin, PEEK Connector One Side, 12" Long	FTAK1512P	Call
Kapton Ribbon Cable, 15-Pin, PEEK Connector Both Sides, 12" Long	FTAK1512PP	Call
Kapton Ribbon Cable, 25-Pin, PEEK Connector One Side, 12" Long	FTAK2512P	Call
Kapton Ribbon Cable, 25-Pin, PEEK Connector Both Sides, 12" Long	FTAK2512PP	Call
Kapton Ribbon Cable, 37-Pin, PEEK Connector One Side, 12" Long	FTAK3712P	Call
Kapton Ribbon Cable, 37-Pin, PEEK Connector Both Sides, 12" Long	FTAK3712PP	Call
Kapton Ribbon Cable, 50-Pin, PEEK Connector One Side, 12" Long	FTAK5012P	Call
Kapton Ribbon Cable, 50-Pin, PEEK Connector Both Sides, 12" Long	FTAK5012PP	Call

➤ UHV Wires

■ Bare Wire

- Suits high vacuum and UHV applications
- Sold in 12" increments



NOTE: Each position in a part number provides information about the specifications or properties of the wire or wire braids. The positions are defined in the table below.

Material	Size (in.)	Part No.	Price
Copper	0.032	FTAWCU032	Call
Copper	0.050	FTAWCU050	Call
Copper	0.094	FTAWCU094	Call
Copper	0.250	FTAWCU250	Call
Nickel	0.032	FTAWNIO32	Call
Nickel	0.050	FTAWNIO50	Call
Nickel	0.092	FTAWNIO92	Call
Nickel	0.250	FTAWNIO250	Call
Stainless Steel	0.032	FTAWSS032	Call
Stainless Steel	0.050	FTAWSS050	Call
Stainless Steel	0.094	FTAWSS094	Call
Stainless Steel	0.250	FTAWSS250	Call

■ Thermocouple Wire

- Alloy 405/426 is the combination of compensating alloys (tungsten 5% rhenium vs. tungsten 26% rhenium) used with thermocouples as extension cable
- Alloy 405/426 wire limited to maximum 870° C
- Suits high vacuum and ultra-high vacuum applications
- Sold in 12" increments
- Each increment of T/C wire includes 12" of both the positive and negative leads
- Please note, this wire is not welded at the tip creating a "hot junction"

NOTE: These connection wires are used to extend the length of a thermocouple. Actual thermocouple feedthroughs sold separately starting on page 3-68.



Material	T/C Type	Size (in.)	Part No.	Price
Alloy 405+/Alloy 426-	C	0.010	FTAWC010	Call
Alloy 405+/Alloy 426-	C	0.020	FTAWC020	Call
Alloy 405+/Alloy 426-	C	0.050	FTAWC056	Call
Chromel®+/Constantan-	E	0.010	FTAWEO10	Call
Chromel+/Constantan-	E	0.020	FTAWEO20	Call
Chromel+/Constantan-	E	0.032	FTAWEO32	Call
Chromel+/Constantan-	E	0.050	FTAWEO50	Call
Iron+/Constantan	J	0.010	FTAWJ010	Call
Iron+/Constantan	J	0.020	FTAWJ020	Call
Iron+/Constantan	J	0.032	FTAWJ032	Call
Iron+/Constantan	J	0.050	FTAWJ050	Call
Chromel+/Alumel®-	K	0.010	FTAWK010	Call
Chromel+/Alumel-	K	0.020	FTAWK020	Call
Chromel+/Alumel-	K	0.032	FTAWK032	Call
Chromel+/Alumel-	K	0.050	FTAWK050	Call
Copper+/Alloy 11-	R, S	0.010	FTAWRS010	Call
Copper+/Alloy 11-	R, S	0.020	FTAWRS020	Call
Copper+/Alloy 11-	R, S	0.032	FTAWRS032	Call
Copper+/Alloy 11-	R, S	0.050	FTAWRS050	Call
Copper+/Constantan-	T	0.010	FTAWT010	Call
Copper+/Constantan-	T	0.020	FTAWT020	Call
Copper+/Constantan-	T	0.032	FTAWT032	Call
Copper+/Constantan-	T	0.050	FTAWT050	Call

➤ **UHV Wires**■ **Kapton[®] Insulated Wire**

- Designed for use in high vacuum and UHV applications
- High mechanical strength, excellent electrical insulation properties, and low outgassing rates making it ideal for use as an in-vacuum insulator
- Utilized in temperature ranges from 4K to 260°C

3

Feedthroughs

Material	Conductor Dia. (mm)	Overall Dia. Maximum (mm)	Maximum Voltage in Vacuum (VCD) *	Maximum Current (A) **	Conductor Area (mm ²)	Resistivity (Ohm/km) ***	Overall Length (m)	Part No.	Price
Plain copper wire, dipped	0.1	0.12	2,000	0.1	0.01	2270	5	FTAK01005	Call
Plain copper wire, dipped	0.14	0.16	2,000	0.2	0.02	1160	10	FTAK01410	Call
Plain copper wire, dipped	0.25	0.28	2,000	1	0.05	360	10	FTAK02510	Call
Plain copper wire, dipped	0.63	0.69	2,000	5	0.31	58	10	FTAK06010	Call
Plain copper wire, dipped	1	1.1	10,000	10	0.79	23	10	FTAK10010	Call
Plain copper wire, dipped	1.7	1.85	12,000	17	2.2	8	5	FTAK1705	Call
Silver plated copper wire, wrapped	0.25	0.55	4,000	1	0.05	360	10	FTAKC02510	Call
Silver plated copper wire, wrapped	0.6	0.9	4,000	4.5	0.28	64	10	FTAKC06010	Call
Multi-Strand coaxial wire, 19 x 0,1mm, outer insulated	0.6	1.4	600	2.5	0.15	119	10	FTAKC060C10	Call
50 ohm coaxial wire, multi strand silver plated conductor	0.45	2.3	5,000	1	0.12	144	1	FTAKC060CM1	Call
Multi Strand silver plated wire, wrapped 7 x 0,08mm	0.23	0.39	600	0.5	0.04	508	10	FTAKCS02510	Call
Multi Strand silver plated wire, wrapped 7 x 0,12mm	0.35	0.5	600	1	0.08	225	10	FTAKCS03510	Call
Multi Strand silver plated wire, wrapped 19 x 0,1mm	0.6	0.67	600	2.5	0.15	119	10	FTAKCS06010	Call
Multi Strand silver plated wire, wrapped 19 x 0,2mm	1	1.17	600	9	0.6	30	10	FTAKCS10010	Call

* Max. Voltage in air is significantly lower. KJLC[®] does not recommend these wires for air use.

** Max. Current depends strongly on use, especially for vacuum applications. If a coil is formed, a temperature test should be done. As an approximation, 1/3 of the given current can be assumed. As the heat dissipation is very low in vacuum, the cables will get hot with continuous use at the given values.

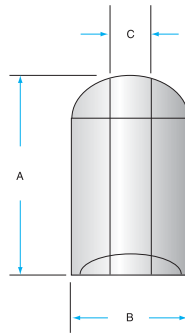
*** Calculated value with conductance of 56 S /mm² at 20° C.

➤ Ceramic Beads & Discs

■ Ceramic Beads

- Also known as fish-spine beads because of flexibility
- Insulate bare electrical wires in air or vacuum systems
- Available fitted to wire sizes up to 0.156" diameter
- Consist of short cylindrical tubes with one concave and one convex end
- Provide continuous shielding of a central conductor when stacked in a mating order
- Their versatility is most evident in nonlinear flexible applications such as shielded coaxial vacuum cabling, projects requiring intricate layout patterns, or projects requiring motion displacement

NOTE: Wire-to-ceramic coaxial clearance does affect overall flexibility; therefore, as wire size increases, flexibility decreases.



Ceramic Beads and Discs

Dimensions (in.)			Beads/Linear ft.	Part No.	Price
A	B	C			
0.125	0.125	0.056	110	FTACERB056	Call
0.170	0.170	0.068	86	FTACERB068	Call
0.200	0.200	0.092	70	FTACERB092	Call
0.260	0.260	0.116	54	FTACERB116	Call
0.330	0.330	0.124	42	FTACERB124	Call
0.400	0.400	0.156	34	FTACERB156	Call

■ Ceramic Discs

- Also known as spacers
- Insulate multi-pin instrumentation, thermocouple feedthroughs, and some power feedthroughs
- For feedthrough assemblies with high-density pin arrangements
- Provide equal and constant spacing between conductor pins

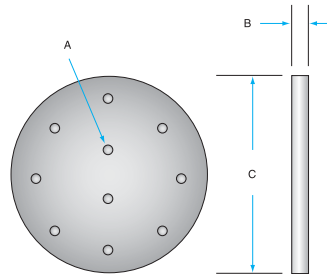


Figure 1

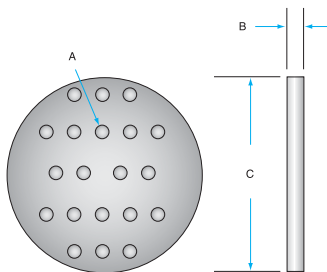


Figure 2

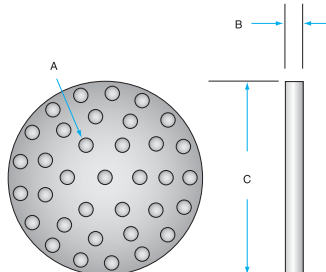


Figure 3

Figure	Holes	Dimensions (in.)			Part No.	Price
		A	B	C		
1	10	0.070	0.135	0.62	FTACERD10	Call
2	20	0.070	0.125	1.25	FTACERD20	Call
3	35	0.090	0.125	1.69	FTACERD35	Call

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