

PRODUCT SELECTION GUIDE



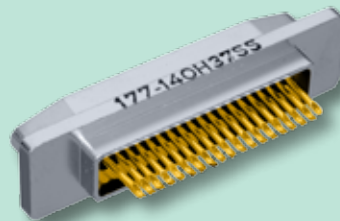
Glenair's Hermetic Micro-D Connectors feature fused glass insulators to provide an airtight seal. These connectors are 100% tested to meet a maximum leak rate of 1×10^{-8} cc's per second of helium.

Matched Kovar® Seal – The shells and contacts are machined from Kovar®, an iron-nickel-cobalt alloy which forms a chemical bond with the vitreous glass insulator. The contacts are gold-plated and the shell is nickel-plated.

Choose Solder Cup, PC Tails or Pre-Wired in two styles: panel mount for soldering or o-ring mount.

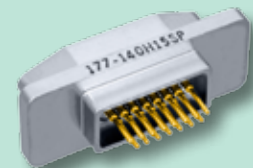
MWDM Solder Mount Hermetic

These Kovar® alloy connectors are available in three styles: solder cup contacts, PC tail contacts or pre-wired and epoxy-sealed. Socket contacts are Kovar® alloy with gold plating. These connectors can be front- or rear-panel mounted. Installation requires soldering, brazing or welding to the bulkhead. Helium leak rate is 1×10^{-9} cc's per second.



**Solder Mount Hermetic
Solder Cup Contacts
Page G-5**

**Solder Mount Hermetic
PC Tail Contacts
Page G-5**



MWDM Hermetic for Rear-Panel Mounting

Avoid the expense of soldering with this o-ring version. Blind tapped mounting holes and integral jackposts provide easy installation. Three termination options are available: solder cup contacts for #26 AWG or smaller wire, PC tails for rigid or flexible circuit boards, or pre-wired with extended epoxy encapsulation to protect and insulate the solder joints.



**O-Ring Hermetic
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MICRO-D HERMETIC CONNECTORS

Hermeticity is defined as "the state or condition of being airtight". Sophisticated military electronics enclosures can experience electrical failure from ingress of moisture. System engineers can design the enclosure to withstand exposure to moisture and condensation by using "moisture-hardened" components and conformal coatings, but often the most practical approach is to install hermetically sealed electrical I/O connectors. Glass-to-metal seals provide assurance that, over the life of the enclosure, the accumulated amount of water vapor inside the box will not exceed the amount necessary to form condensation. Other applications for Micro-D hermetic connectors include vacuum chambers, cryogenics, and enclosures filled with inert gas.

Kovar® Alloy

Glenair's hermetic Micro-D shells and contacts are made from a special alloy called Kovar®, an iron-nickel-cobalt alloy consisting of 54% Fe, 29% Ni, and 17% Co. This alloy is covered by SAE specification AMS-I-23011. Kovar has a relatively low coefficient of thermal expansion.

Matched Glass-To-Metal Seals

Matched seals rely on a chemical bond between the metal and the glass. Kovar contacts and shells are first exposed to high temperatures in order to develop an oxide coating. Then, the borosilicate glass and metal components are assembled with fixtures and are fused in a firing furnace at 900° C. A strong chemical bond is created between the metal and glass. Unlike compression seals which rely on different thermal coefficients of expansion between the glass and metal, a matched seal offers better resistance to stress from thermal extremes.

Hermetic Testing

All Micro-D hermetic connectors are 100% tested prior to shipment. A helium leak test is performed to certify the hermetic seal. This test is conducted by inducing a 1 ATM vacuum on one side of the connector. Helium gas is released on the other side, and a mass spectrometer "counts" the number of helium molecules that penetrate the connector seal. Helium leak testing takes advantage of the small size of a helium molecule compared to air or water vapor. Helium is inert, rare in our atmosphere, and is easy to detect with a mass spectrometer.

Micro-D Hermetic Plating Options

Unlike regular connectors which are plated as components prior to assembly, hermetic connectors are electroplated after the parts are fired and cleaned of oxides. Typically the contacts are gold-plated and the connector shell is nickel-plated.

Connector Installation

Hermetic connectors are typically soldered or welded into panels or bulkheads. Laser welding is a good option if the connector is mounted onto a Kovar or stainless steel panel. If the panel is aluminum alloy, then soldering is recommended. Micro-D's with o-ring seals offer another alternative. O-rings, when installed properly, will provide a very low permeability seal. The seating surface must be free from scratches or imperfections. A 32 finish is acceptable, but a 16 finish is preferred. The o-ring can be coated with a light coat of vacuum grease.



MICRO-D HERMETIC CONNECTOR DESIGN NOTES

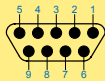
“Why can't I get a hermetic Micro-D with pin contacts instead of sockets?”

The Micro-D TwistPin contact cannot be made from the materials that are required for hermetic contacts. Hermetic contacts are made from ferrous alloys such as Kovar® or Alloy 52. These alloys do not have spring properties. The Micro-D TwistPin contact is made from spring-temper beryllium copper. The Micro-D socket

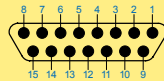
contact is a cylinder and does not provide any spring force, so Micro-D hermetic connectors are always receptacle connectors with socket contacts. “What about high pressure?” “What is the maximum recommended pressure rating for a hermetic Micro-D?”

Glenair hermetic Micro-D's are built to safely withstand 1000 PSI of hydrostatic pressure in an open face (unmated) condition.

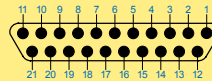
MICRO-D CONTACT ARRANGEMENTS (FACE VIEW SOCKET CONNECTOR)



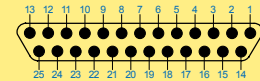
9 Socket



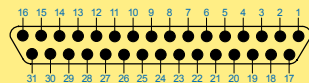
15 Socket



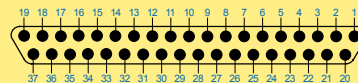
21 Socket



25 Socket



31 Socket



37 Socket



Micro-D Hermetic Connectors General Information

MATERIALS AND FINISHES

Connector Shell	Kovar® Alloy in Accordance With SAE AMS-I-23011 Class 1, Plated with Electrodeposited Nickel In Accordance With SAE-AMS-QQ-N-290 Class 2, 0.0002-0.0003 Inches Thick.
Insulator	Borosilicate Glass
Interfacial Seal	Fluorosilicone Rubber, Blue
Socket Contact	Kovar® Alloy in Accordance With SAE AMS-I-23011 Class 1, Gold Plated In Accordance With ASTM B 488 Type II, Class 1.27 (50 microinches minimum) over Nickel Underplate in Accordance With SAE-AMS-QQ-N-290 Class 2.
Hardware	300 Series Stainless Steel
O-Ring	Fluorosilicone Rubber, Blue
Encapsulant	Epoxy

PERFORMANCE SPECIFICATIONS

Current Rating	3 AMP
Dielectric Withstanding Voltage	150 VAC
Working Voltage	100 VDC
Insulation Resistance	5000 Megohms Minimum
Contact Resistance	30 Milliohms Maximum
Hermeticity	Maximum Helium Leak Rate 1 X 10 ⁻⁸ cc's per Second at One Atmosphere
Operating Temperature	-55° C. to +125° C.
Shock	50 g.
Vibration	20 g.
Outgassing	Meets NASA Outgassing Requirements
Mating Force	(10 Ounces) X (# of Contacts)
For additional performance requirements, please refer to MIL-DTL-83513	

CONNECTOR WEIGHTS FOR 177-140H HERMETIC SOLDER MOUNT

Maximum Weight In Grams

Layout	Solder Cup	PCB
9	4.7	4.5
15	7.1	6.8
21	8.2	8.0
25	8.7	8.4
31	9.5	9.2
37	10.8	10.4

Micro-D Hermetic Connectors Solder Mount 177-140H and 177-704H



Micro-D
Hermetic



Solder these 177-140 and 704 hermetic Micro-D connectors. Featuring a matched glass-to-metal seal, these socket receptacles are designed for panel mounting.

Kovar® Shells and Contacts comply with applicable MIL-DTL-83513 requirements and are 100% intermateable with standard connectors.

Choose 9 to 37 Contacts, with gold-plated contacts and nickel-plated shells. These connectors feature integral female jackposts.

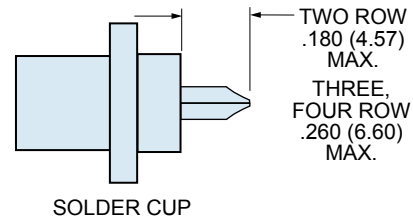
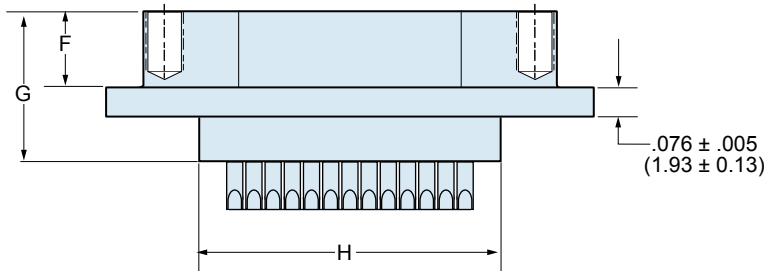
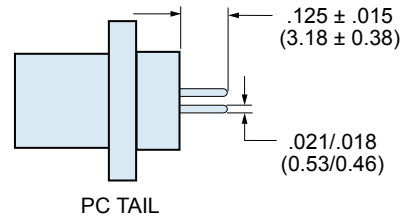
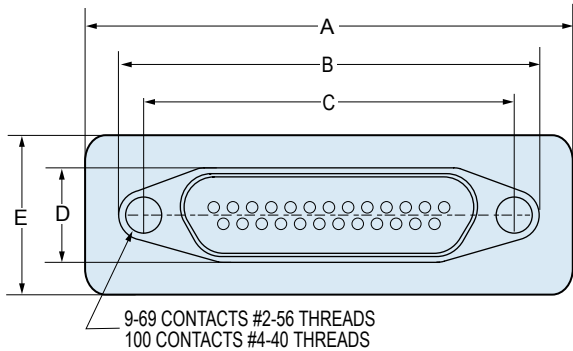
HOW TO ORDER SOLDER CUP AND PC TAIL CONNECTORS

Series	Layout Number of Contacts	Contact Type	Termination Type
177-140H Micro-D Hermetic Socket Receptacle, Solder or Weld Mounting	9 15 21 25 31 37	S – Socket	S – Solder Cup P – PC Tail
Sample Part Number			
177-140H	15	S	P

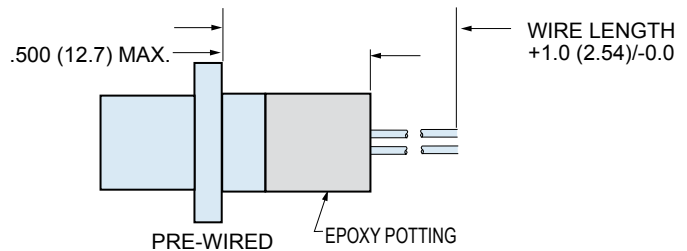
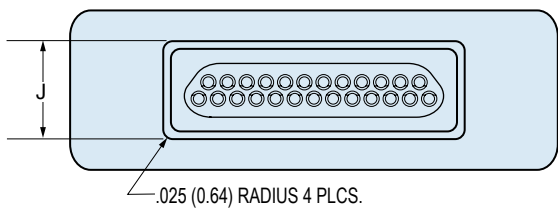
HOW TO ORDER PRE-WIRED CONNECTORS

Series	Layout	Contact Type	Wire Gage (AWG)	Wire Type	Wire Color	Wire Length Inches
177-704H	9 15 21 25 31 37	S – Socket	6 – #26 8 – #28 0 – #30	K – M22759/11 600 Vrms Teflon® (TFE) (Not Available in #30 AWG) J – M22759/33 600 Vrms Modified Cross-Linked Tefzel® (ETFE)	1 – White 2 – Yellow 5 – Color-Coded Stripes Per MIL-STD-681 (#26 gage only) 7 – Ten Color Repeat	18 Wire Length In Inches. "18" Specifies 18 Inches.
Sample Part Number						
177-704H	25	S	6	K	1	– 18

H



H



DIMENSIONS

Layout	A Max.		B MAX.		C		D Max.		E Max.		F		G Max.		H		J	
	In.	mm.	In. ± .005	mm. ± .013	In. ± .003	mm. ± 0.08	In.	mm.	In.	mm.	In. ± .004	mm. ± 0.10	In.	mm.	In. ± .004	mm. ± 0.10	In. ± .004	mm. ± 0.10
9S	.785	19.94	.695	14.35	.565	14.35	.250	6.35	.310	7.87	.195	4.95	.394	10.01	.398	10.11	.268	6.81
15S	1.030	26.16	.855	21.71	.715	18.16	.250	6.35	.425	10.80	.195	4.95	.394	10.01	.535	13.59	.255	6.48
21S	1.180	29.97	1.005	25.53	.865	21.97	.250	6.35	.425	10.80	.195	4.95	.394	10.01	.750	19.05	.255	6.48
25S	1.280	32.51	1.105	28.06	.965	24.51	.250	6.35	.425	10.80	.195	4.95	.394	10.01	.785	19.94	.255	6.48
31S	1.430	36.32	1.255	31.88	1.115	28.32	.250	6.35	.425	10.80	.195	4.95	.394	10.01	.935	23.75	.255	6.48
37S	1.580	40.13	1.425	36.20	1.265	32.13	.250	6.35	.425	10.80	.195	4.95	.394	10.01	1.085	27.56	.255	6.48

Micro-D Hermetic Connectors Rear Panel Mount with O-Ring 177-705H and 177-706H



Micro-D
Hermetic



Fluorosilicone O-Ring eliminates the cost of soldering or welding the connector to a bulkhead.

Kovar® Shells and Contacts comply with applicable MIL-DTL-83513 requirements and are 100% intermateable with standard connectors.

Solder Cup, PC Tail or Pre-Wired and Fully Potted Suitable for #26 gage wire or smaller, solder cup versions feature gold-plated contacts. Choose PC tails for attachment to flex circuits or rigid boards. Solder cup versions are also available pre-wired and potted.

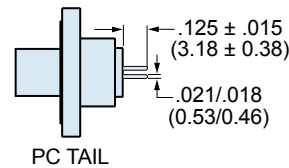
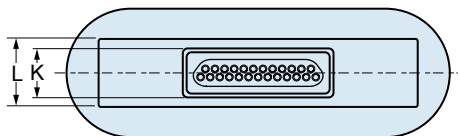
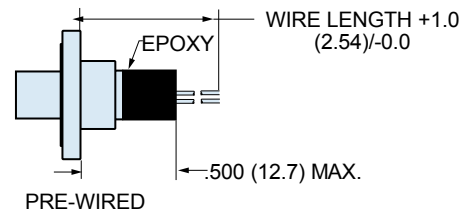
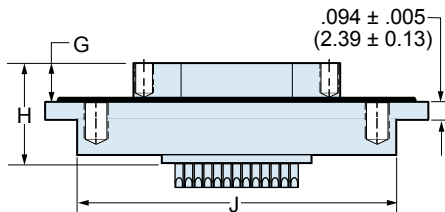
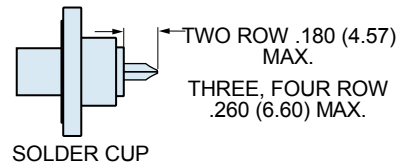
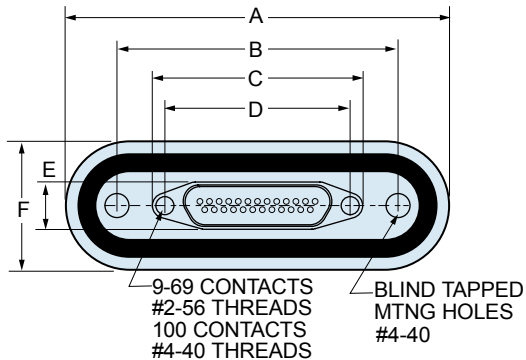
HOW TO ORDER SOLDER CUP AND PC TAIL CONNECTORS

Series	Layout Number of Contacts	Contact Type	Termination Type	Mounting Threads
177-705H Micro-D Hermetic Socket Receptacle, Rear Panel Mount with O-Ring, Solder Cup or PC Tail	9 15 21 25 31 37	S – Socket	S – Solder Cup P – PC Tail	U – #4 - 40 UNC P – M3 Metric
Sample Part Number				
177-705H	15	S	P	U

HOW TO ORDER PRE-WIRED CONNECTORS

Series	Layout	Contact Type	Wire Gage (AWG)	Wire Type	Wire Color	Wire Length Inches
177-706H	9 15 21 25 31 37	S – Socket	6 – #26 8 – #28 0 – #30	K – M22759/11 600 Vrms Teflon (TFE) (Not Available in #30 AWG) J – M22759/33 600 Vrms Modified Cross-Linked Tefzel (ETFE)	1 – White 2 – Yellow 5 – Color-Coded Stripes Per MIL-STD-681 (#26 gage only) 7 – Ten Color Repeat	18 Wire Length In Inches. "18" Specifies 18 Inches.
Sample Part Number						
177-706H	25	S	6	K	1	– 18

H



DIMENSIONS

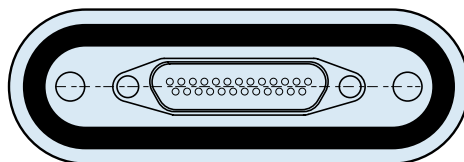
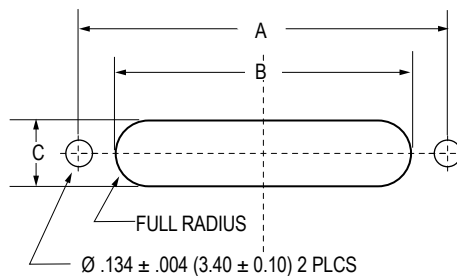
Layout	A Max.		B		C MAX.		D		E MAX.		F Max.		G		H Max.		J		K		L Max.		M	
	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.
9S	1.488	37.80	1.011	25.67	.728	18.49	.565	14.35	.250	6.35	.675	17.14	.195	4.95	.526	13.36	1.254	31.85	.254	6.45	.275	6.99	.410	10.41
15S	1.638	41.61	1.161	29.48	.878	22.30	.715	18.16	.250	6.35	.675	17.14	.195	4.95	.526	13.36	1.414	36.91	.254	6.45	.275	6.99	.540	13.72
21S	1.788	45.42	1.311	33.29	1.028	32.51	.865	21.97	.250	6.35	.675	17.14	.195	4.95	.526	13.36	1.564	39.72	.254	6.45	.275	6.99	.710	18.03
25S	1.888	47.96	1.411	35.83	1.128	28.65	.965	24.51	.250	6.35	.675	17.14	.195	4.95	.526	13.36	1.664	42.26	.254	6.45	.275	6.99	.540	13.72
31S	2.038	51.76	1.561	39.64	1.278	32.46	1.115	28.32	.250	6.35	.675	17.14	.195	4.95	.526	13.36	1.814	46.07	.254	6.45	.275	6.99	.955	24.26
37S	2.188	55.57	1.711	43.45	1.428	36.27	1.265	32.13	.250	6.35	.675	17.14	.195	4.95	.526	13.36	1.984	50.39	.254	6.45	.275	6.99	1.095	27.81

**Micro-D Hermetic Connectors
Rear Panel Mount
with O-Ring 177-705H and 177-706H**



Micro-D
Hermetic

PANEL CUTOUT DIMENSIONS FOR 177-705 AND 177-706

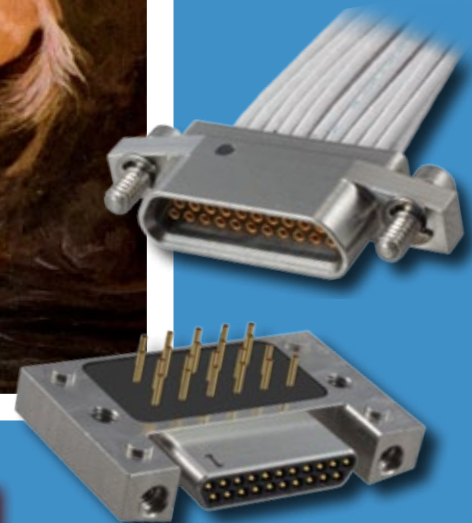


Layout	A		B		C	
	In. $\pm .003$	mm. ± 0.08	In. $+0.005/-0.0$	mm. $+0.13/-0.0$	In. $+ .005/-0.0$	mm. $+0.13/-0.0$
9	1.011	25.69	.731	18.56	.252	6.40
15	1.161	29.50	.881	22.37	.252	6.40
21	1.311	33.31	1.031	26.18	.252	6.40
25	1.411	35.85	1.131	28.72	.252	6.40
31	1.561	39.66	1.281	32.53	.252	6.40
37	1.711	43.47	1.431	36.34	.252	6.40



Too Hot to Handle?

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