MISSION-CRITICAL
INTERCONNECT SOLUTIONS

Glenair®

AEROSPACE-GRADE / FLIGHT HERITAGE

Backshells and Shielding Accessories

For Micro-D and D-Subminiature Rectangular Connectors

JULY 2019

Glenair®

Commander Ed White on the first American spacewalk, 1965 with Glenair-manufactured "Golden Umbilical" cable

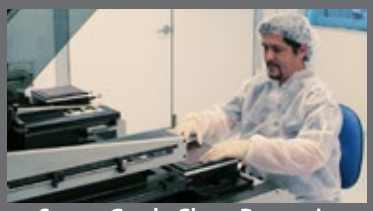
Glenair has been providing Space-Grade Interconnect Solutions since the earliest manned space flights.

At Glenair, we understand the highly-specialized mechanical, electrical and optical performance requirements for data, video, and control communications in exoatmospheric vehicles. Space-rated interconnect systems require specialized materials processing and precise mating interfaces. Size and weight reduction are additional key requirements. All are Glenair strengths.

Space is one of the most severe environments imaginable. During launch, spacecraft and their payloads are shaken violently and battered with intense sound waves. Earth's atmosphere has an insulating property, but spacecraft operating beyond this layer of protection are subjected to shock, vibration, temperature, corrosion, and acoustic stress factors which can damage mission-critical systems.

Temperatures in space can range from extremely cold—hundreds of degrees below freezing—to many hundreds of degrees above, especially if a spacecraft ventures close to the sun. Temperature extremes can generate stress in metal, glass and polymer materials and potentially lead to cracking or other failures.

At Glenair, the overriding concern for space-grade interconnects is reliability. When millions of dollars worth of equipment is at stake—not to mention invaluable human cargo when brave and talented women and men take flight—the interconnect components we manufacture have to work with assured reliability and safety every time.



Space-Grade Clean Rooms in every Glenair facility worldwide

Certified independent test labs

ESA and Mil-Standard soldering and crimping

AEROSPACE-GRADE / SPACE FLIGHT

Backshells and Shielding Accessories

for Micro-D and D-Subminature Connectors

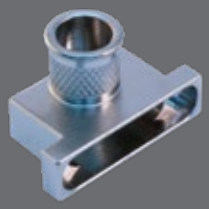
SPACE GRADE NASA ESA, JAXA SCREENED

MICRO-D | D-SUBMINIATURE | SHIELDING/GROUNDING | INTERCONNECT SHOWCASE | FACTORY TOUR

SPACE-GRADE MICRO-D BACKSHELLS AND ACCESSORY HARDWARE

Single and dual top entry

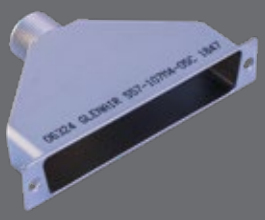
Angled entry



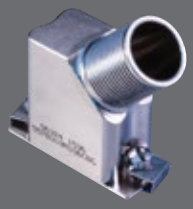
Single and dual side entry

Elliptical entry

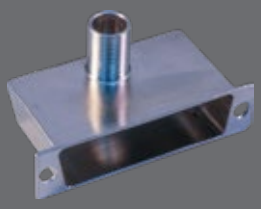
SPACE-GRADE D-SUBMINIATURE BACKSHELLS AND ACCESSORY HARDWARE



Single, dual, and triple entry



Angled entry

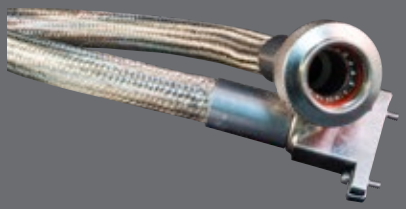


Side entry

Elliptical entry

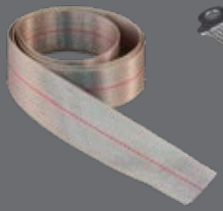
Composite split shell

ARMORLITE™ LIGHTWEIGHT SHIELDING AND GROUNDING TECHNOLOGIES

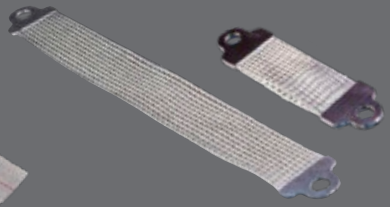


Tubular shielding

Side-entry shielding

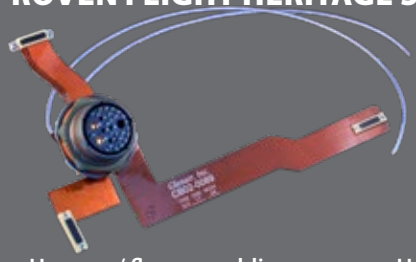


Spot-repair mesh tape



Ground straps

PROVEN FLIGHT HERITAGE SPACE-GRADE INTERCONNECT SHOWCASE



Harness / flex assemblies

Hold-down release mechanisms

Micro-D connectors

D-Subminiature connectors

FACTORY TOURS: COMMON WORLDWIDE ACCREDITATIONS AND STANDARDS

Glenair ISO 9001 Certified AS9100 Certified Worldwide Quality System

IEC

IECEx

Accredited Nadcap™

SPACE GRADE NASA ESA, JAXA SCREENED

CLASS G IAW SPACE GRADE

SPACE-GRADE MICRO-D BACKSHELLS

Product Selection Guide

SOLID SHELL LIGHTWEIGHT ALUMINUM EMI/RFI AND STRAIN-RELIEF BACKSHELLS

500-010
Banding porch platform for shield termination with Band-Master ATS® Standard or Micro bands. Round cable entry. Top, side, 45° or dual 45° entry options.
Page 6

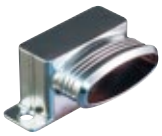
507-142
Banding porch platform for shield termination with Band-Master ATS® Standard or Micro bands. Dual round cable entry.
Page 8

500-012
Qwik-Ty arm for cable strain relief. Round cable entry. Top, Side, or 45° entry options.
Page 9

SOLID SHELL ULTRA LIGHTWEIGHT COMPOSITE EMI/RFI BACKSHELL

507-088
High-strength, ultra lightweight composite thermoplastic. Electroless Nickel plated for EMI shielding effectiveness. Banding porch platform for shield termination with Band-Master ATS® Micro bands. Round cable entry. Top, Side, or 45° entry options.
Page 10

SOLID SHELL LIGHTWEIGHT ALUMINUM EMI/RFI BACKSHELLS, ELLIPTICAL ENTRY



507-296
Banding porch platform for shield termination with Band-Master ATS® Micro bands. Elliptical cable entry. Top or Side entry options.
Page 12

507-297
Banding porch platform for shield termination with Band-Master ATS® Micro bands. Elliptical cable entry. 45° entry.
Page 14

SPLIT SHELL LIGHTWEIGHT ALUMINUM EMI/RFI BACKSHELL, ELLIPTICAL ENTRY

507-178
Split construction with screwlocks for easy assembly: connectors can be fully mated before hardware is fastened. Banding porch platform for shield termination with Band-Master ATS® bands. Elliptical cable entry.
Page 16

LIGHTWEIGHT ALUMINUM SADDLE-BAR TYPE CABLE CLAMP STRAIN RELIEF BACKSHELLS

507-198
Saddle bar clamp with silicone pads for easy installation of flat cable bundle
Page 18

507-146
Saddle bar clamp for easy installation of round cable bundle
Page 19

OTHER MICRO-D CONNECTOR ACCESSORIES

500-016
Shorting can backshell for protection of stand-alone connectors. Lightweight aluminum with lanyard attachment options.
Page 20

507-035
Potting shell for easy encapsulation of solder-cup wire terminations. Lightweight aluminum.
Page 21

500-107
Lightweight aluminum protective cover for Micro-D plug or receptacle connectors with a variety of lanyard rope attachment options.
Page 22

Product Selection Guide

SPACE GRADE
NASA
ESA, JAXA
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Micro-D Backshell Selection Guide

	Backshell Type					Cable Entry								Hardware						Other			
	EMI backshell	Available in Lightweight Composite	Strain Relief Backshell	Potting Shell / Shorting Can	Protective Cover	Round Cable Entry	Elliptical Cable Entry	Top Cable Entry	45° Cable Entry	Side Cable Entry	Slot Head Jackscrews	Hex Head Jackscrews	Extended Jackscrews	Screw Locks	One Piece Backshell	Split (Two Piece) Backshell	Accepts Standard Shield Band	Accepts Micro Shield Band	Connector Attaches with Clip	Connector Attaches with E-Ring	Connector is Captivated by Backshell	Page No.
500-010	●					●		●	●	●	●	●	(1)	●	●		●	●	●				**6**
507-142	●					●		●			●	●	●	●	●		●	●	●				**8**
500-012			●			●		●	●	●	●	●	(1)		●				●				**9**
507-088	●	●				●		●	●	●	●	●	(1)		●			●	●				**10**
507-296	●						●	●		●	●	●	●		●			●		●			**12**
507-297	●						●		●		●	●	(1)		●			●		●			**14**
507-178	●						●	●			●	●	●	●		●		●				●	**16**
507-198			●					●			●	●	●		●				●				**18**
507-146			●					●			●	●	●		●				(2)	(2)			**19**
500-016	●			●							●	●	●		●				●				**20**
507-035				●							●	●	●		●				●				**21**
500-107					●						●	●	●		●								**22**

(1) Extended jackscrew will not work with 45° cable entry or with dual 45° entry backshells.

(2) Sizes 9 thru 69 use e-rings or c-clips for connector attachment, 100 pin uses c-clip only.

Application Notes

About Micro-D Backshells

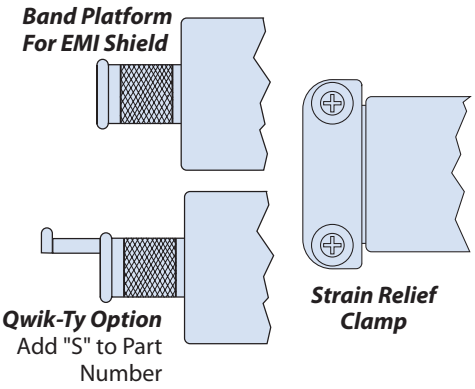
Micro-D EMI backshells are used to ground cable shields for electromagnetic compatibility, and to provide strain relief and mechanical protection of wire-to-connector terminations. These backshells are made out of aluminum alloy or composite thermoplastic. Electroless nickel is the most widely used finish. These backshells are compatible with industry-standard metal shell M83513 type connectors. The following application notes explain how to select the right type of backshell.

EMI Versus Non-EMI Backshells

Select EMI backshells if your cable has a braided shield or screen. The cable shield must be terminated to the backshell for electromagnetic compatiblity (EMC). Glenair recommends Band-Master ATS® Micro bands, supplied with the backshell or purchased separately for reliable shield termination.

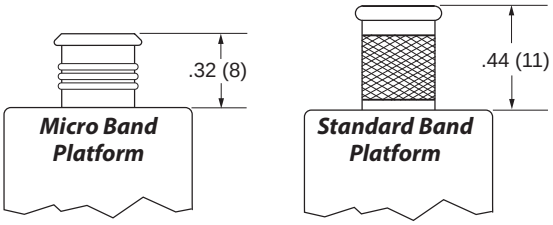
Select a strain relief backshell to prevent wire-to-connector terminations from inadvertent removal due to vibration, shock, or handling.

EMI backshells with Band-Master ATS® shield terminations do not normally require additional strain relief. Micro-D wires are typically potted in place, and the shield braid alone provides sufficient additional strain relief. Optional Qwik-Ty legs are available on a number of backshells for additional light-duty strain relief.



Standard Band Versus Micro Band

Most Micro-D EMI backshells feature low-profile band platforms designed for a narrow (.125" width) Micro Band. Some have a taller band platform which also accepts standard-width bands (.250" width).



One-Piece versus Split-Shell Backshells

Split-shell backshells allow for easy installation over already terminated wires. Some split backshells fit over the connector, eliminating the ferromagnetic clip component. Split-shell versions also can accommodate screw locks. One-piece backshells must be staged on the wire bundle prior to final wire-to-connector termination.

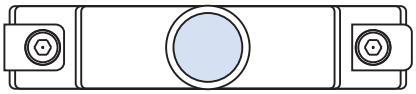
Jackscrews and Screwlocks

Jackscrews are fixed in position and are used to drive connectors together during mating. Screwlocks float and allow the connectors to be coupled manually before the screwlocks are engaged. Screwlocks allow faster mating, while jackscrews offer less risk of contact damage.

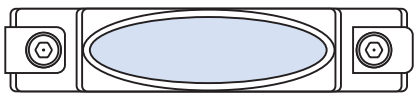
Elliptical Versus Circular Cable Entry

Choose elliptical backshells if the wire bundle diameter is too big to fit in a circular cable entry. Large Micro-D connectors (51 pins and up) usually exceed the limits of the round entries. Refer to the cable entry and wire bundle tables in this section to determine if an elliptical entry is necessary.

The actual size illustrations to the right show the difference between round and elliptical cable entries. The round entry cross-sectional area = π ($\frac{1}{2}$D)^2 = .11 In.^{2}. The formula for the area of an ellipse is π (Length)(Width) ÷ 4 = .36 In.^{2}



Round Cable Entry
100 Pin .375 Inch (9.5 mm) Diameter



Elliptical Cable Entry
100 Pin .360 by 1.29 Inch (9.1 X 32.8 mm)

Application Notes

Maximum Discrete Wire Bundle Diameters (See Note 1)					
No. Of Wires	Wire Gauge	M22759/11		M22759/33	
		Wire Bundle Diameter	Recommended Backshell Cable Entry Code	Wire Bundle Diameter	Recommended Backshell Cable Entry Code
9	#24	0.153 (3.90)	06	0.132 (3.40)	05
9	#26	0.136 (3.50)	05	0.115 (2.90)	05
9	#28	0.119 (3.00)	05	0.098 (2.50)	04
15	#24	0.197 (5.00)	08	0.171 (4.30)	06
15	#26	0.175 (4.40)	07	0.149 (3.80)	06
15	#28	0.153 (3.90)	06	0.127 (3.20)	05
21	#24	0.233 (5.90)	09	0.202 (5.10)	07
21	#26	0.207 (5.30)	08	0.176 (4.50)	07
21	#28	0.181 (4.60)	07	0.150 (3.80)	06
25	#24	0.254 (6.50)	*	0.220 (5.60)	08
25	#26	0.226 (5.70)	09	0.192 (4.90)	07
25	#28	0.198 (5.00)	08	0.164 (4.20)	06
31	#24	0.283 (7.20)	*	0.245 (6.20)	09
31	#26	0.252 (6.40)	09	0.214 (5.40)	08
31	#28	0.220 (5.60)	08	0.182 (4.60)	07
37	#24	0.309 (7.90)	*	0.268 (6.80)	*
37	#26	0.275 (7.00)	*	0.234 (5.90)	09
37	#28	0.241 (6.10)	09	0.199 (5.10)	08
51	#24	0.363 (9.20)	*	0.315 (8.00)	*
51	#26	0.323 (8.20)	*	0.274 (7. 0)	10
51	#28	0.282 (7.20)	*	0.234 (5.90)	09
100	#24	.509 (12.9)	*	0.441(11.2)	*
100	#26	.452 (11.5)	*	0.384 (9.80)	*
100	#28	.396 (10.1)	*	0.328 (8.30)	12

*Glenair recommends elliptical style backshell

NOTES:

1. This sizing chart is for discrete wire bundles of the type and gauge indicated. When using twisted pairs, or other wire types/configurations, refer to Glenair Circular Connector Backshells & Accessories catalog, page 8, "Calculating Wire Bundle Diameter." Glenair recommends 70% area fill (wire bundle area to entry port area), not to exceed 80% area fill on Micro-D Backshells.
2. When solder-cup Micro-D connectors and low-profile backshells (short in height) are used in conjunction, the transition angle from the outer pins to the centralized entry port becomes severe and can increase the susceptibility to damage. Glenair recommends elliptical shaped entries to minimize angles of contact that can occur with round cable entries.
3. Blending and deburring/smoothing of internal geometry may not produce "perfectly" smooth, rounded features, but has a proven history of success in precluding wire abrasion damage. For additional wire protection, wrap wire bundle with DuPont™ Kapton® tape in areas that may come into contact with cable entry transitions or other interior angles.
4. Glenair recommends that harness designs avoid excessive fill percentages and severe contact angles as previously described. For applications where these conditions must exist, consult our factory for appropriate additional design / workmanship solutions

Space-Grade Finish Options			
Finish Code	Description	Specification	Corresponding Connector Finish Code
M	Electroless Nickel	SAE-AMS-26074 Class 3	Code 2
XM	Electroless Nickel (Composite Only)	SAE-AMS-26074 Class 3	Code 2
Z2	Gold Plated	ASTM B488	Code 5
GME	Gold over Electroless Nickel	ESCC No. 3401/072 Para. 4.4.2	FR 172

Materials	
Shell, Saddle Clamps	Aluminum Alloy 6061 -T6 Per QQ-A-200, QQ-A-225 (Machined Components) Aluminum Alloy 6061-T6 Per QQ-A-591 (A380) (Die-Cast Components)
Clips, E-Rings	17-7PH Stainless Steel
Jackscrews, Washers, Jackposts	300 Series Stainless Steel, Passivated

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Lightweight EMI/RFI Banding Backshell

Solid shell, round cable entry
Top, side, 45°, and dual 45° entry options · 500-010

Glenair's Most Popular Micro-D Backshell is stocked in all sizes. Choose straight (top), side, 45°, or dual 45° cable entry.

Rugged One-Piece Aluminum Shell with stainless steel hardware, available in electroless nickel or gold plating.

17-7PH Stainless Steel Clips attach the backshell to the connector. These backshells accept standard and micro Band-Master ATS® shield termination straps.

How To Order EMI/RFI Backshells

Sample Part Number	500T010	M	25	H	08	S	

Series	**500T010** - Top Entry **500S010** - Side Entry **500E010** - 45° Entry **500D010** - Dual 45° (See Table III)
Shell Finish	**M** – Electroless Nickel **Z2** – Gold
Shell Size	**09**, **15**, **21**, **25**, **31**, **37**, **51**, **51-2**, **67**, **69**, **100** (See Table III)
Hardware Option	**Screwlocks** **B** - (2) Fillister Head Screwlocks **H** - (2) Hex Head Screwlock **E** - (2) Extended Screwlock (styles T and S only) **F** - (2) Jackpost, Female **N** - No Hardware **Jackscrews** **BJ** - (2) Male Fillister Head Jackscrew **HJ** - (2) Hex Socket Jackscrew **EJ** - Extended Jackscrew (styles T and S only) **Mixed** **FB** - (1) Female Jackpost, (1) Male Fillister Head **FH** - (1) Female Jackpost, (1) Male Hex Socket
Cable Entry Code	**04** - .125 (3.2) **05** - .156 (4.0) **06** - .188 (4.8) **07** - .219 (5.6) **08** - .250 (6.4) **09** - .281 (7.1) **10** - .312 (7.9) **11** - .344 (8.7) **12** - .375 (9.5) (See Table I)
Qwik-Ty Option	**S** - with Qwik-Ty strain relief **Omit** for none
Band-Master ATS® EMI Band Strap Option	**Omit** (Leave Blank) - Band Not Included **Standard Band - .250" Wide** **B** - Uncoiled Band Included **K** - Coiled Band Included **Micro Band - .125" Wide** **M** - Uncoiled Band Included **L** - Coiled Band Included

Table I: Maximum Cable Entry Code

Shell Size	Style E & T	Style D	Style S
9	08	06	09
15	08	08	10
21	08	08	10
25	08	08	12
31	09	09	12
37	09	09	12
51	10	10	12
51-2	09	09	12
67	09	09	12
69	10	10	12
75	10	10	12
100	12	12	12
130	12	12	12

Table II: Maximum Cable Entry Dimensions

Cable Size	P ±.015		R Dia. Max	
	In. ± .015	mm. ± 0.38	In.	mm.
04	.125	3.2	.296	7.5
05	.156	4.0	.327	8.3
06	.188	4.8	.359	9.1
07	.219	5.6	.390	9.9
08	.250	6.4	.421	10.7
09	.281	7.1	.452	11.5
10	.312	7.9	.484	12.3
11	.344	8.7	.515	13.1
12	.375	9.5	.546	13.7

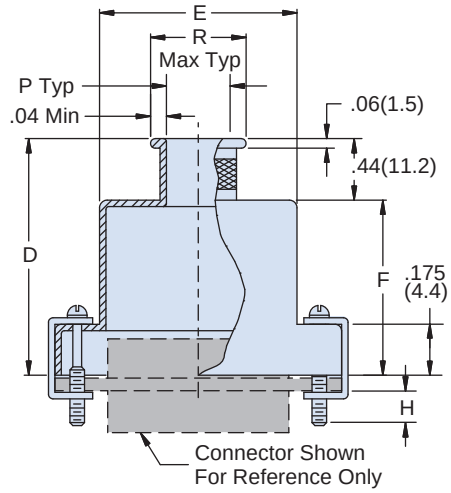
MATERIALS/FINISH

Backshell: Aluminum alloy
Hardware: CRES / passivated

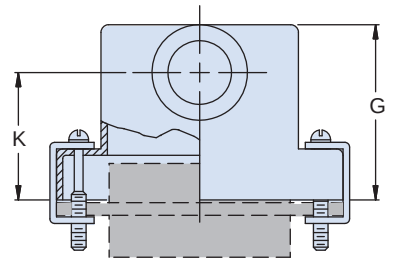
Lightweight EMI/RFI Banding Backshell

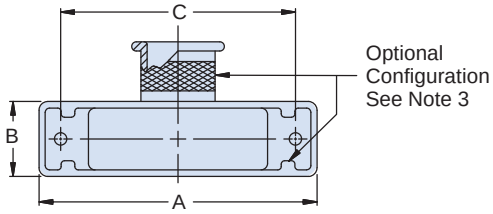
Solid shell, round cable entry
Top, side, 45°, and dual 45° entry options · 500-010

Style T - Top Entry

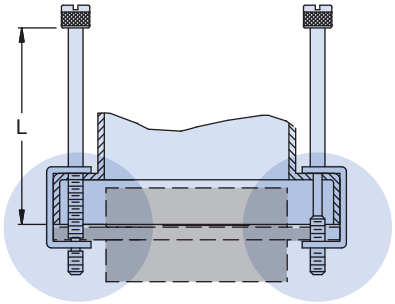


Style S - Side Entry





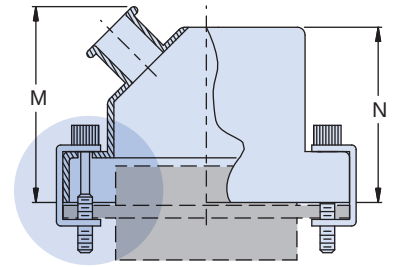
Available for Style T and S Only



Code EJ
Extended Jackscrew

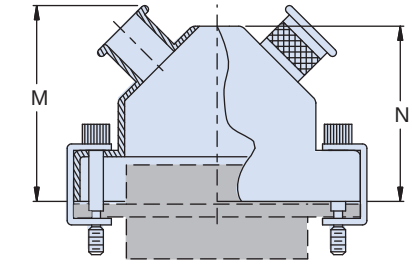
Code E
Extended Screwlock

Style E - 45° Entry

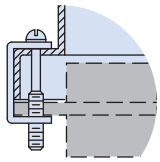


Code H
Hex Head Screwlock

Style D - 45° Dual Entry

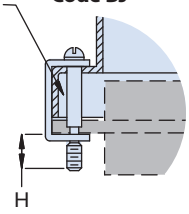


Code B

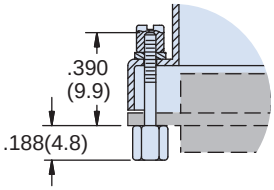


Code BJ

Configuration
Mfr Option

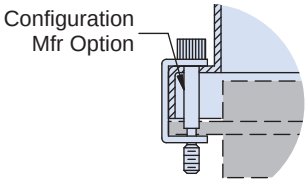


Code F
Female Jackpost



Code HJ
Hex Socket Jackscrew

Configuration
Mfr Option



Code S
Qwik-Ty

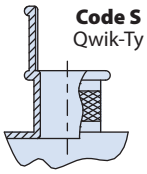


Table III: Dimensions

Size	A Max.		B Max.		C		D Max.		E Max.		F Max		G Max		H Ref		J Thread	K		L Max.		M Max.		N Max.	
	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.		In.	mm.	In.	mm.	In.	mm.	In.	mm.
09	.850	21.59	.370	9.40	.565	14.35	.780	19.81	.410	10.41	.350	8.89	.637	16.18	.154	3.9	2-56 UNC-2	.435	11.05	1.040	26.42	1.000	25.40	.680	17.27
15	1.000	25.40	.370	9.40	.715	18.16	.910	23.11	.580	14.73	.470	11.94	673	17.09	.154	3.9	2-56 UNC-2	.440	11.2	1.170	29.72	1.030	26.16	.730	18.54
21	1.150	29.21	.370	9.40	.865	21.97	1.030	26.16	.740	18.80	.590	14.99	.707	17.95	.154	3.9	2-56 UNC-2	.458	11.63	1.290	32.77	1.050	26.67	.765	19.43
25	1.250	31.75	.370	9.40	.965	24.51	1.090	27.69	.850	21.59	.650	16.51	.748	19.00	.154	3.9	2-56 UNC-2	.483	12.27	1.350	34.29	1.090	27.69	.830	21.08
31	1.400	35.56	.370	9.40	1.115	28.32	1.150	29.21	.980	24.89	.710	18.03	.756	19.20	.154	3.9	2-56 UNC-2	.476	12.09	1.420	36.07	1.130	28.70	.890	22.61
37	1.550	39.37	.370	9.40	1.265	32.13	1.190	30.23	1.130	28.70	.750	19.05	.774	19.66	.154	3.9	2-56 UNC-2	.478	12.14	1.450	36.83	1.230	31.24	.955	24.26
51	1.500	38.10	.410	10.41	1.215	30.86	1.220	30.99	1.080	27.43	.780	19.81	.859	21.82	.154	3.9	2-56 UNC-2	.548	13.91	1.480	37.59	1.250	31.75	1.005	25.53
51-2	1.910	48.51	.370	9.40	1.615	41.02	1.220	30.99	1.510	38.35	.780	19.81	.859	21.82	.154	3.9	2-56 UNC-2	.548	13.91	1.480	37.59	1.250	31.75	1.005	25.53
67	2.310	58.67	.370	9.40	2.015	51.18	1.220	30.99	1.880	47.75	.780	19.81	.859	21.82	.154	3.9	2-56 UNC-2	.548	13.91	1.480	37.59	1.250	31.75	1.005	25.53
69	1.810	45.97	.410	10.41	1.515	38.48	1.220	30.99	1.380	35.05	.780	19.81	.859	21.82	.154	3.9	2-56 UNC-2	.548	13.91	1.480	37.59	1.250	31.75	1.005	25.53
75	2.140	54.36	.410	10.41	1.705	43.31	1.220	30.99	1.375	34.93	.780	19.81	.859	21.82	.184	4.7	4-40 UNC-2	.548	13.91	1.480	37.59	1.250	31.75	1.005	25.53
100	2.235	56.77	.460	11.68	1.800	45.72	1.280	32.51	1.470	37.34	.840	21.34	1.014	25.76	.184	4.7	4-40 UNC-2	.687	17.45	1.580	40.13	1.320	33.53	1.080	27.43
130	2.595	65.92	.460	11.68	2.160	54.86	1.280	32.51	1.830	46.48	.840	21.34	1.014	25.76	.184	4.7	4-40 UNC-2	.687	17.45	1.580	40.13	1.320	33.53	1.080	27.43

Dimensions in Inches (millimeters) are subject to change without notice.

Lightweight EMI/RFI Dual-Entry Banding Backshell

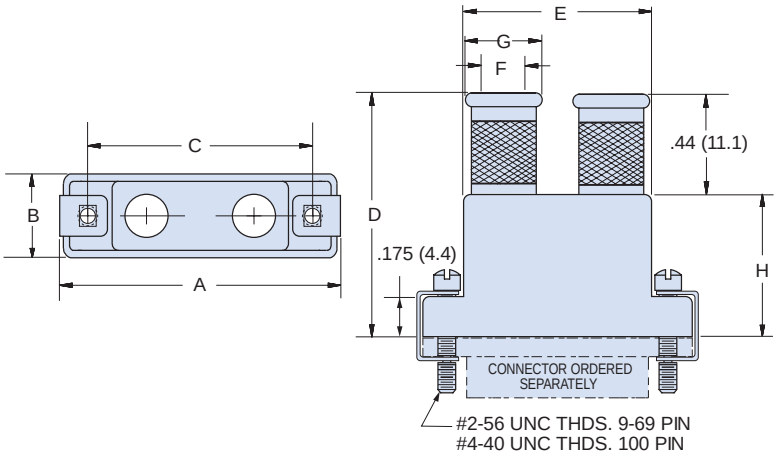
Solid shell, dual top round cable entry
507-142

Dual Cable Entry EMI backshell allows attachment of two separate wire bundles to the same Micro-D connector. This backshell accepts both standard and micro shield termination straps.

MATERIALS/FINISH

Backshell: Aluminum alloy
Hardware: CRES / passivated

How To Order EMI/RFI Dual Entry Backshell						
Sample Part Number		**507-142**	**M**	**25**	**H**	**M**
Series	**507-142**					
Shell Finish	**M** – Electroless Nickel **Z2** – Gold					
Connector Size	**21, 25, 31, 37, 51, 51-2, 67, 69, 100** (See Table I)					
Hardware Option	**B** – Fillister Head Jackscrew **H** – Hex Head Jackscrew **E** – Extended Jackscrew **F** – Jackpost, Female					
EMI Band Strap Option	**Omit (Leave Blank)** – Band Not Included **B** – Standard Band (2 supplied) .250" Wide **M** – Micro Band (2 supplied) .125" Wide					



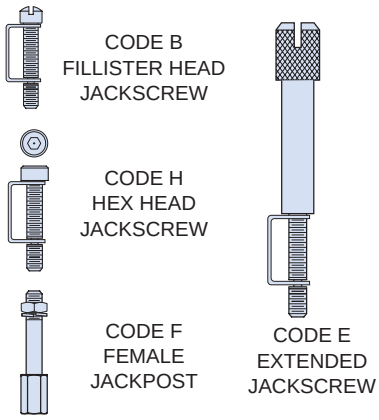
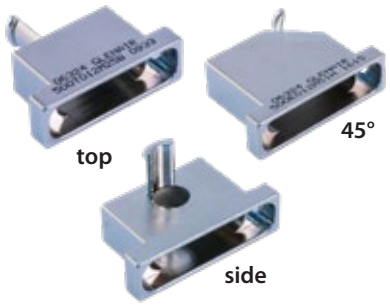


Table I: Dimensions

Size	A Max.		B Max.		C		D Max.		E Max.		F		G		H Max.	
	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.
21	1.150	29.21	.370	9.40	.865	21.97	1.030	26.16	.740	18.80	.125	3.18	.281	7.13	.590	14.99
25	1.250	31.75	.370	9.40	.965	24.51	1.090	27.69	.850	21.59	.188	4.78	.344	8.74	.650	16.51
31	1.400	35.56	.370	9.40	1.115	28.32	1.150	29.21	.980	24.89	.250	6.35	.406	10.31	.710	18.03
37	1.550	39.37	.370	9.40	1.265	32.13	1.190	30.23	1.130	28.70	.344	8.74	.500	12.70	.750	19.05
51	1.500	38.10	.410	10.41	1.215	30.86	2.130	54.10	1.080	27.43	.312	7.92	.469	11.91	.780	19.81
51-2	1.910	48.51	.370	9.40	1.615	41.02	2.130	54.10	1.510	38.35	.281	7.13	.469	11.91	.780	19.81
67	2.310	58.67	.370	9.40	2.015	51.18	2.130	54.10	1.880	47.75	.281	7.13	.469	11.91	.780	19.81
69	1.810	45.97	.410	10.41	1.515	38.48	2.130	54.10	1.380	35.05	.312	7.93	.469	11.91	.780	19.81
100	2.235	56.77	.460	11.68	1.800	45.72	1.280	32.51	1.470	37.34	.500	12.70	.688	17.48	.840	21.34

Lightweight Qwik-Ty Strain-Relief Backshell

Solid shell, round, top, side, and 45° cable entry 500-012



Qwik-Ty Backshell is stocked in all sizes. Choose "M" Nickel Finish and "T" top entry for best availability. Customer-furnished cable ties provide strain relief to wire bundles. Suitable for jacketed cable or use with individual wires.

MATERIALS/FINISH

Backshell: Aluminum alloy
Hardware: CRES / passivated

How To Order Qwik-Ty Strain Relief Backshells					
Sample Part Number		**500T012**	**M**	**25**	**H**
Series	**500T012** - Top Entry **500S012** - Side Entry **500E012** - 45° Entry				
Shell Finish	**M** – Electroless Nickel **Z2** – Gold				
Connector Size	**09, 15, 21, 25, 31, 37 51, 51-2, 67, 69, 100** (See Table I)				
Hardware Option	**B** – Fillister Head Jackscrew **H** – Hex Head Jackscrew **E** – Extended Jackscrew **F** – Jackpost, Female				

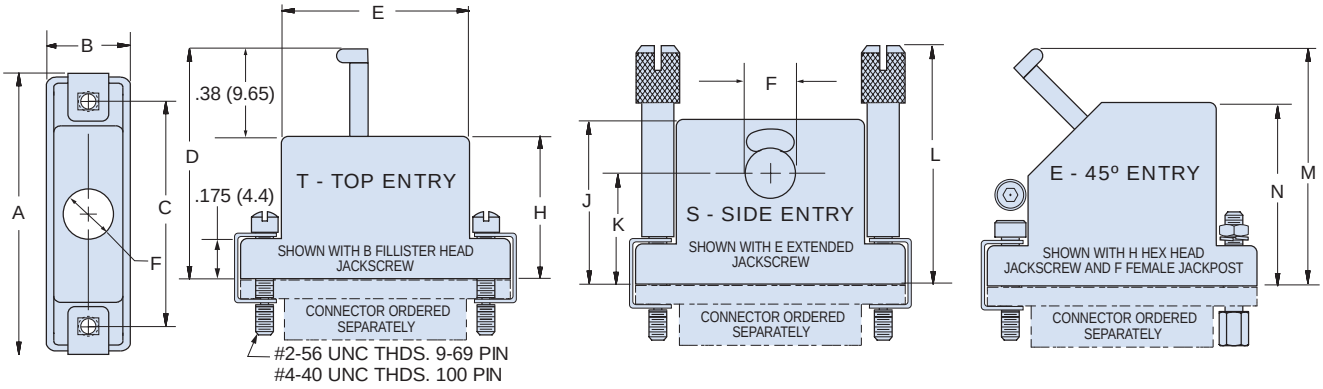


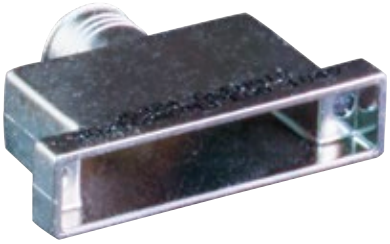
Table I: Dimensions

Size	A Max.		B Max.		C		D Max.		E Max.		F		H Max.		J Max.		K		L Max.		M Max.		N Max.	
	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In. ± .005	mm. ± 0.13	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.
09	.850	21.59	.370	9.40	.565	14.35	.780	19.81	.410	10.41	.156	3.18	.350	8.89	.637	16.18	.435	11.05	1.040	26.42	1.000	25.40	.680	17.27
15	1.000	25.40	.370	9.40	.715	18.16	.910	23.11	.580	14.73	.188	3.96	.470	11.94	.673	17.09	.440	11.20	1.170	29.72	1.030	26.16	.730	18.54
21	1.150	29.21	.370	9.40	.865	21.97	1.030	26.16	.740	18.80	.219	4.78	.590	14.99	.707	17.95	.458	11.63	1.290	32.77	1.050	26.67	.765	19.43
25	1.250	31.75	.370	9.40	.965	24.51	1.090	27.69	.850	21.59	.250	5.56	.650	16.51	.748	19.00	.483	12.27	1.350	34.29	1.090	27.69	.830	21.08
31	1.400	35.56	.370	9.40	1.115	28.32	1.150	29.21	.980	24.89	.265	6.35	.710	18.03	.756	19.20	.476	12.09	1.420	36.07	1.130	28.70	.890	22.61
37	1.550	39.37	.370	9.40	1.265	32.13	1.190	30.23	1.130	28.70	.281	7.14	.750	19.05	.774	19.66	.478	12.14	1.450	36.83	1.230	31.24	.955	24.26
51	1.500	38.10	.410	10.41	1.215	30.86	1.220	30.99	1.080	27.43	.312	7.92	.780	19.81	.859	21.82	.548	13.91	1.480	37.59	1.250	31.75	1.005	25.53
51-2	1.910	48.51	.370	9.40	1.615	41.02	1.220	30.99	1.510	38.35	..281	7.14	.780	19.81	.859	21.82	.548	13.91	1.480	37.59	1.250	31.75	1.005	25.53
67	2.310	58.67	.370	9.40	2.015	51.18	1.220	30.99	1.880	47.75	.281	7.14	.780	19.81	.859	21.82	.548	13.91	1.480	37.59	1.250	31.75	1.005	25.53
69	1.810	45.97	.410	10.41	1.515	38.48	1.220	30.99	1.380	47.75	.312	7.92	.780	19.81	.859	21.82	.548	13.91	1.480	37.59	1.250	31.75	1.005	25.53
100	2.235	56.77	.460	11.68	1.800	45.72	1.280	32.51	1.470	37.34	.375	9.53	.840	21.34	1.014	25.76	.687	17.45	1.580	40.13	1.320	33.53	1.080	27.43

Dimensions in Inches (millimeters) are subject to change without notice.

Lightweight Composite EMI/RFI Banding Backshell

Solid shell, round, top, side, and 45° cable entry · 507-088



Save Weight and Eliminate Corrosion Damage with composite Micro-D backshells. These round cable entry backshells are injection-molded with high strength Ultem 2300 fiberglass-reinforced thermoplastic.

Choose Top, Side or 45° Cable Entry.

Electroless Nickel Plated for excellent EMI shielding effectiveness.

How To Order EMI/RFI Banding Backshells

Sample Part Number	507T088	XM	25	H	08

Series	**507T088** - Top Entry **507S088** - Side Entry **507E088** - 45° Entry (See Table II)
Shell Finish	**XM** - Electroless Nickel
Connector Size	**09**, **15**, **21**, **25**, **31**, **37** **51**, **100** (See Table III)
Hardware Option	**B** – Fillister Head Jackscrew **E** – Extended Jackscrew (Not Available for 45° Cable Entry) **H** – Hex Head Jackscrew **F** - Jackpost, Female (See Table I)
Cable Entry Code	**04** – .125 (3.2) **05** – .156 (4.0) **06** – .188 (4.8) **07** – .219 (5.6) **08** – .250 (6.4) **09** – .281 (7.1) **10** – .312 (7.9) **11** – .344 (8.7) **12** – .375 (9.5) (See Table IV)

Maximum Cable Entry Per Entry Style and Shell Size Selections

Size	T Top Entry	E 45° Entry	S Side Entry
9	08	08	09
15	08	08	12
21	08	08	12
25	08	08	12
31	09	09	12
37	09	09	12
51	10	10	12
100	12	12	12

Table I: Hardware Option

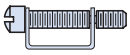
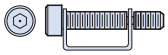
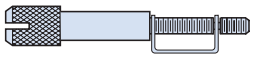
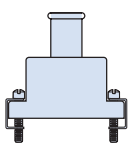
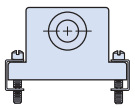
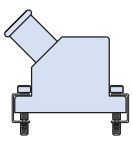
			
B - Fillister Head Jackscrew	**H** - Hex Head Jackscrew	**E** - Extended Jackscrew (Not for 45° Entry)	**F** - Jackpost, Female

Table II: Entry Styles

507T088 Top Entry	507S088 Side Entry	507E088 45° Entry
		

MATERIALS

Backshell: Ultem 2300
Hardware: CRES / passivated

Lightweight Composite EMI/RFI Banding Backshell

Solid shell, round, top, side, and 45° cable entry · 507-088

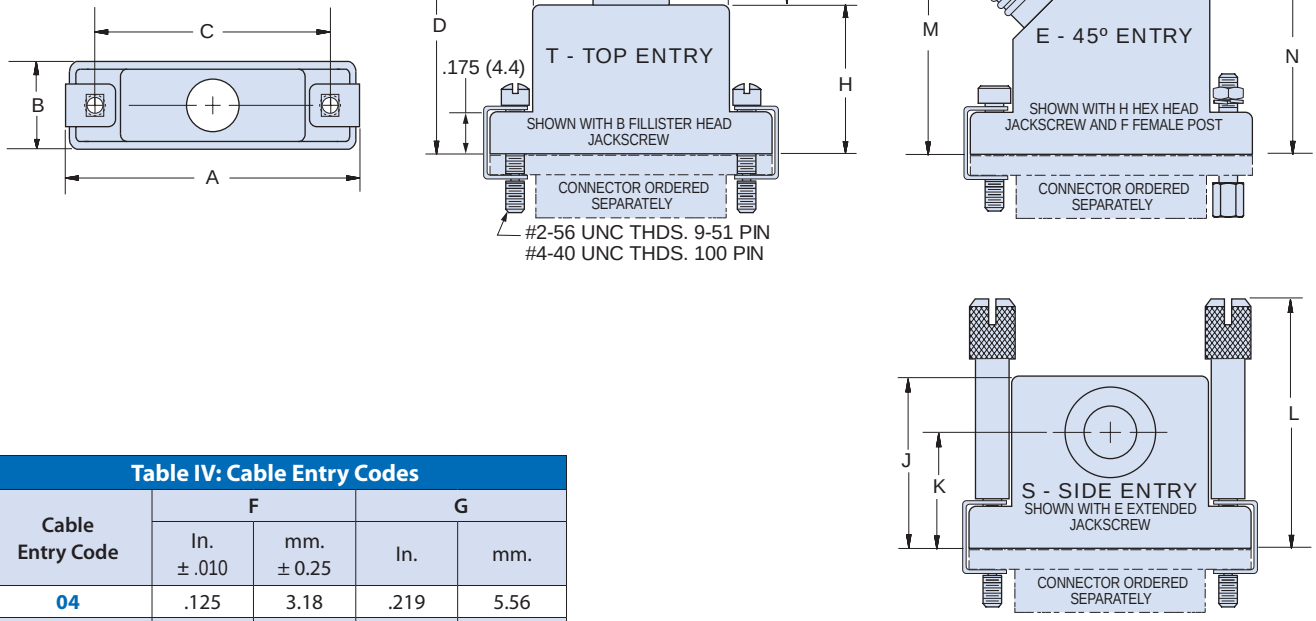


Table IV: Cable Entry Codes				
Cable Entry Code	F		G	
	In. ± .010	mm. ± 0.25	In.	mm.
04	.125	3.18	.219	5.56
05	.156	3.96	.250	6.35
06	.188	4.78	.281	7.14
07	.219	5.56	.313	7.95
08	.250	6.35	.344	8.74
09	.281	7.14	.375	9.53
10	.312	7.92	.406	10.31
11	.344	8.74	.438	11.13
12	.375	9.53	.469	11.92

Table III: Dimensions																						
Size	A Max.		B Max.		C		D Max.		E Max.		H Max.		J Max.		K		L Max.		M Max.		N Max.	
	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.
09	.850	21.59	.370	9.40	.565	14.35	.780	19.81	.410	10.41	.460	8.89	.680	17.27	.435	11.05	1.040	26.42	1.000	25.40	.680	17.27
15	1.000	25.40	.370	9.40	.715	18.16	.790	20.07	.580	14.73	.470	11.94	.730	18.54	.440	11.2	1.170	29.72	1.030	26.16	.730	18.54
21	1.150	29.21	.370	9.40	.865	21.97	.910	23.11	.740	18.80	.590	14.99	.765	19.43	.458	11.63	1.290	32.77	1.050	26.67	.765	19.43
25	1.250	31.75	.370	9.40	.965	24.51	.970	24.64	.850	21.59	.650	16.51	.830	21.08	.483	12.27	1.350	34.29	1.090	27.69	.830	21.08
31	1.400	35.56	.370	9.40	1.115	28.32	1.030	26.16	.980	24.89	.710	18.03	.890	20.32	.476	12.09	1.420	36.07	1.130	28.70	.890	22.61
37	1.550	39.37	.370	9.40	1.265	32.13	1.070	27.18	1.130	28.70	.750	19.05	.955	24.26	.478	12.14	1.450	36.83	1.230	31.24	.955	24.26
51	1.500	38.10	.410	10.41	1.215	30.86	1.100	27.94	1.080	27.43	.780	19.81	1.005	25.53	.548	13.91	1.480	37.59	1.250	31.75	1.005	25.53
100	2.235	56.77	.460	11.68	1.800	45.72	1.160	29.46	1.470	37.34	.810	21.34	1.080	27.43	.687	17.45	1.580	40.13	1.320	33.53	1.080	27.43

Lightweight EMI/RFI Elliptical Backshell

Solid shell, elliptical, top and side cable entry · 507-296

EMI/RFI Elliptical Lightweight Metal Shell Backshells provides added room for larger wire bundles. Terminate cable shields with Band-Master ATS® Micro Bands.

Rugged Aluminum housing with stainless steel hardware, available in standard nickel plating, or choose optional finishes.

How To Order EMI/RFI Metal Shell Backshells

Sample Part Number	507T296	M	25	D	H	L

Series	**507T296** - Top Entry (Straight) **507S296** - Side Entry (90°)
Finish Symbol	**M** – Electroless Nickel **Z2** – Gold
Shell Size	**09**, **15**, **21**, **25**, **31**, **37**, **51**, **51-2**, **67**, **69**, **75**, **100** (See Table I)
Entry Code	

Code	G	Available Sizes
A	0.320	09 Thru 100
B	0.470	15 Thru 100
C	0.620	21 Thru 100
D	0.720	25 Thru 100
E	0.870	31 Thru 100
F	0.970	37 Thru 100
G	1.020	37 & 51-2 Thru 100
H	1.270	51-2 Thru 100
J	1.360	51-2, 67 & 100
K	1.770	67

Hardware Option	**B** - Fillister Head Jackscrew **H** - Socket Head Jackscrew **E** - Extended Jackscrew **F** - Female Jackpost
EMI Band Strap Option	**Omit (Blank)** - No Band **M** - Uncoiled .125" Wide Band **L** - Coiled .125" Wide Band

NOTES

1. See 507-297 for 45° configuration
2. Symbol 'E' extended hardware is not to be used with straight backshell at max cable entry size.

MATERIAL/FINISH

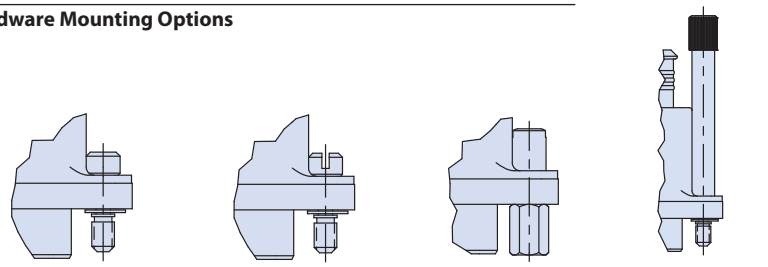
- Backshell - al alloy/see Table 2
- Hardware-cres/pasivated

Lightweight EMI/RFI Elliptical Backshell

Solid shell, elliptical, top and side cable entry · 507-296

SPACE GRADE NASA ESA, JAXA SCREENED

Hardware Mounting Options



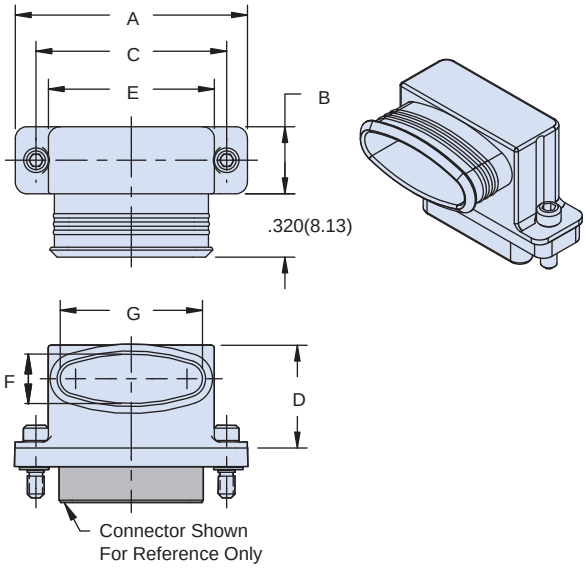
Code H
Socket Head Jackscrew

Code B
Fillister Head Jackscrew

Code F
Female Jackpost

Code E
Extended Jackscrew
(See Note 2)

Style S
Side Entry (90°)



Style T
Top Entry (Straight)

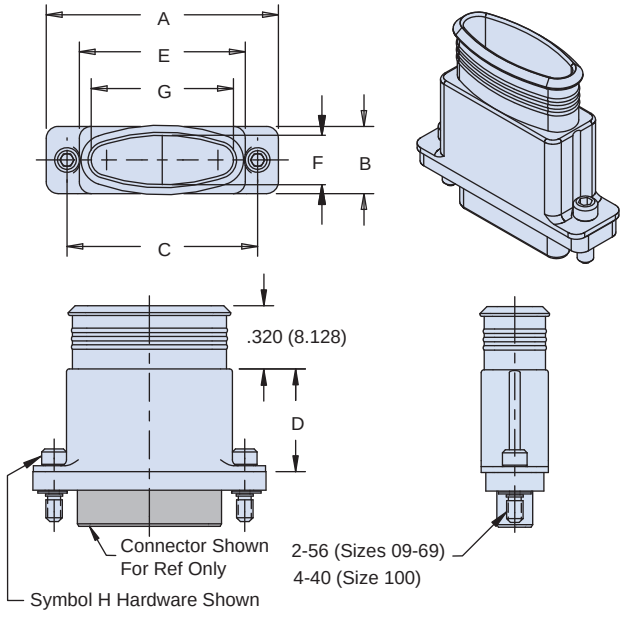


Table I: Dimensions

Size	A		B		C		D		E		F		Max Entry
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	
09	0.775	19.69	0.340	8.64	0.565	14.35	0.520	13.21	0.440	11.18	0.250	6.35	A
15	0.925	23.50	0.340	8.64	0.715	18.16	0.520	13.21	0.590	14.99	0.250	6.35	B
21	1.075	27.31	0.340	8.64	0.865	21.97	0.520	13.21	0.740	18.80	0.250	6.35	C
25	1.175	29.85	0.340	8.64	0.965	24.51	0.520	13.21	0.840	21.34	0.250	6.35	D
31	1.325	33.66	0.340	8.64	1.115	28.32	0.520	13.21	0.990	25.15	0.250	6.35	E
37	1.475	37.47	0.340	8.64	1.265	32.13	0.520	13.21	1.140	28.96	0.250	6.35	G
51	1.425	36.20	0.380	9.65	1.215	30.86	0.610	15.49	1.090	27.69	0.290	7.37	F
51-2	1.825	46.36	0.340	8.64	1.615	41.02	0.520	13.21	1.490	37.85	0.250	6.35	J
67	2.225	56.52	0.340	8.64	2.015	51.18	0.520	13.21	1.890	48.01	0.250	6.35	K
69	1.725	43.82	0.380	9.65	1.515	38.48	0.610	15.49	1.390	35.31	0.290	7.37	H
75	2.070	52.58	0.380	9.65	1.705	43.30	0.520	13.20	1.490	37.85	0.290	7.37	J
100	2.160	54.86	0.430	10.92	1.800	45.72	0.630	16.00	1.522	38.66	0.340	8.64	J

Lightweight EMI/RFI Elliptical Backshell

Solid shell, elliptical 45° cable entry · 507-297

EMI/RFI Lightweight Metal Shell Backshells provide rugged aluminum housing with stainless steel hardware, available in standard nickel plating, or choose optional finishes. Terminate cable shields with Band-Master ATS® Micro Bands.

How To Order EMI/RFI Lightweight Backshells

Sample Part Number	507E297	M	25	D	H	L

Series	**507E297** - End Entry Style (45°)
Finish Code	**M** – Electroless Nickel **Z2** – Gold
Shell Size	**09**, **15**, **21**, **25**, **31**, **37**, **51**, **51-2**, **67**, **69**, **75**, **100** (See Table I)
Entry Code	

Entry Code	H	Available Sizes
A	.188	09 Thru 100
B	.230	15 Thru 100
C	.265	21 Thru 100
D	.335	25 Thru 100
E	.360	31 Thru 100
F	.410	37 Thru 100
G	.520	51 Thru 100
H	.585	51-2 Thru 100
J	.665	67 Thru 100
K	.720	67 and 100
L	.760	67

Hardware Option	**B** - Fillister Head Jackscrew	**H** - Socket Head Jackscrew	**F** - Female Jackpost
EMI Band Strap Option	**Omit (Blank)** - No Band	**M** - Uncoiled .125" Wide Band	**L** - Coiled .125" Wide Band

NOTES

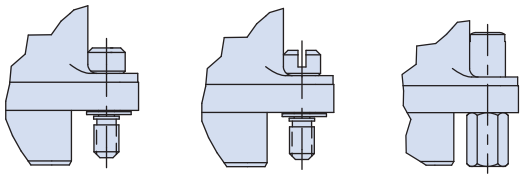
See 507-296 for straight & 90° configurations.

MATERIAL/FINISH

Backshell: Aluminum alloy
Hardware: CRES / passivated

Lightweight EMI/RFI Elliptical Backshell

Solid shell, elliptical 45° cable entry · 507-297

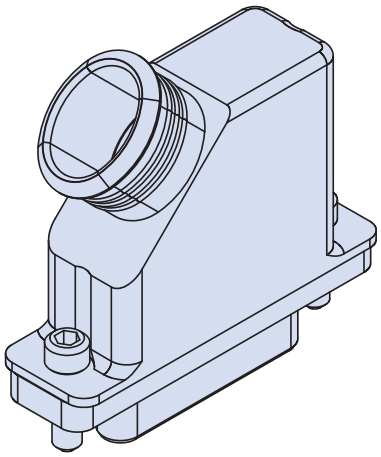


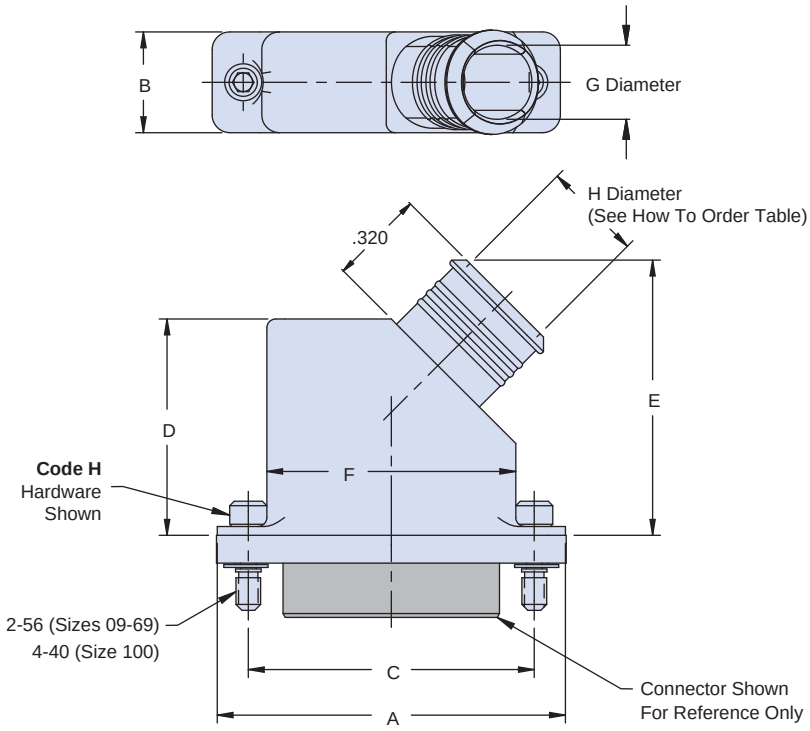
Code H
Socket Head Jackscrew

Code B
Fillister Head Jackscrew

Code F
Female Jackpost

Hardware Mounting Options





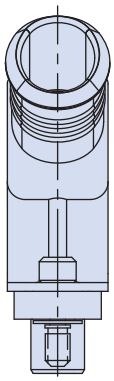


Table I: Dimensions

Size	A		B		C		D		E		F		G		Max Entry
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	
09	0.775	19.69	0.340	8.64	0.565	14.35	0.500	12.70	0.700	17.78	0.440	11.18	-	-	A
15	0.925	23.50	0.340	8.64	0.715	18.16	0.560	14.22	0.760	19.30	0.590	14.99	-	-	B
21	1.075	27.31	0.340	8.64	0.865	21.97	0.660	16.76	0.860	21.84	0.740	18.80	0.250	6.35	C
25	1.175	29.85	0.340	8.64	0.965	24.51	0.730	18.54	0.930	23.62	0.840	21.34	0.250	6.35	D
31	1.325	33.66	0.340	8.64	1.115	28.32	0.810	20.57	1.010	25.65	0.990	25.15	0.250	6.35	E
37	1.475	37.47	0.340	8.64	1.265	32.13	0.890	22.61	1.090	27.69	1.140	28.96	0.250	6.35	F
51	1.425	36.20	0.380	9.65	1.215	30.86	0.900	22.86	1.100	27.94	1.090	27.69	0.290	7.37	G
51-2	1.825	46.36	0.340	8.64	1.615	41.02	1.030	26.16	1.230	31.24	1.490	37.85	0.250	6.35	H
67	2.225	56.52	0.340	8.64	2.015	51.18	1.030	26.16	1.230	31.24	1.890	48.01	0.250	6.35	K
69	1.725	43.82	0.380	9.65	1.515	38.48	1.050	26.67	1.250	31.75	1.390	35.31	0.290	7.37	J
100	2.160	54.86	0.430	10.92	1.800	45.72	1.100	27.94	1.300	33.02	1.522	38.66	0.340	8.64	L

EMI/RFI Split-Shell Elliptical Backshell

Split shell, elliptical, top cable entry · 507-178

Split Backshell With Elliptical Cable Entry provides added room for larger wire bundles. Terminate cable shields with Band-Master ATS® Micro Bands. This backshell features floating male screwlocks which allow full mating of the connector before the screws are fastened.

Rugged Aluminum housing with stainless steel hardware, available in electroless nickel or gold plating

How To Order EMI/RFI Split Shell Backshells								
Sample Part Number		**507-178**	**M**	**25**	**06**	**K**	**F**	**T**
Series	**507-178**							
Shell Finish	**M** – Electroless Nickel **Z2** – Gold							
Connector Size	**09**, **15**, **21**, **25**, **31**, **37**, **51**, **51-2**, **67**, **69**, **75**, **100**, **130** (See Table I)							
Cable Entry Code	**04**, **05**, **06**, **07**, **08**, **09**, **10**, **11**, **12**, **13**, **14**, **15**, **16** (See Table II)							
EMI Band Strap Option	**B** - Micro Band Supplied **K** - Coiled Micro Band Supplied **Omit** (Leave Blank) - Band Strap Not Supplied							
Hardware Option	**Screwlocks** **H** - (2) Hex Head Screwlock **E** - (2) Extended Screwlock (styles T and S only) **F** - (2) Jackpost, Female **FF** - Fixed Female Jackpost **FE** - Extended Female Jackpost	**Jackscrews** **J** - (2) Fillister Head Jackscrew **HJ** - Hex Socket Jackscrew **EJ** - Extended Jackscrew (styles T and S only) **Omit** for standard knurl head Screwlock						
Qwik-Ty Option	**T** = with Qwik-Ty strain relief **Omit** for none							

NOTES

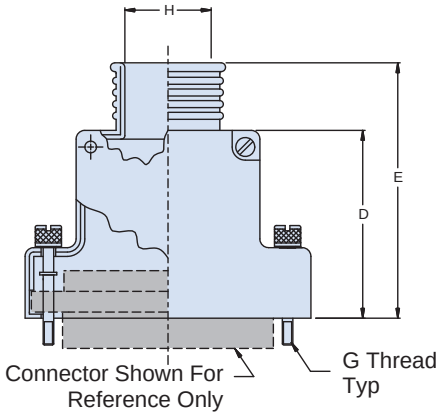
Screwlocks: screws float to allow connector to engage completely before tightening.
Jackscrews: screws must be tightened simultaneous with connector engagement

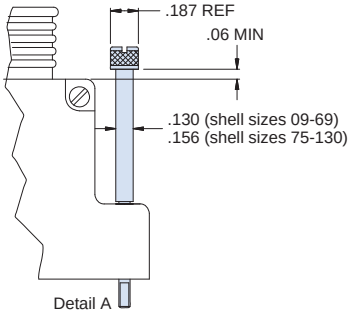
MATERIALS/FINISH

Backshell: Aluminum alloy
Hardware: CRES / passivated

EMI/RFI Split-Shell Elliptical Backshell

Split shell, elliptical, top cable entry · 507-178





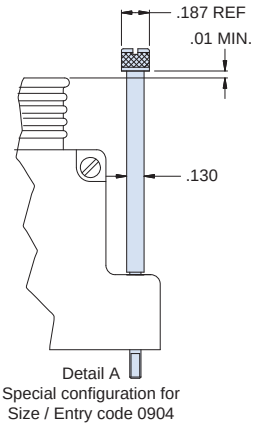
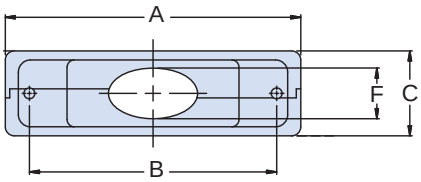
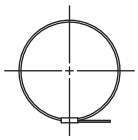
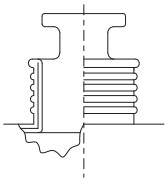


Table II: Cable Entry Code			
Code	H		Available on Shell Size
	In. ± .010	mm. ±0.25	
04	.250	6.35	09, 15, 21
05	.312	7.92	15 Thru 31
06	.375	9.53	21 Thru 51
07	.437	11.10	25 Thru 51
08	.500	12.70	25 Thru 51
09	.562	14.27	31 Thru 100
10	.625	15.88	31 Thru 100
11	.688	17.48	37 Thru 100
12	.750	19.05	37 Thru 100
13	.812	20.62	37,51-2,67,69,100
14	.875	22.23	51-2, 67, 69, 100
15	.938	23.83	51-2, 67, 69, 100
16	1.000	25.40	51-2, 67, 69, 100

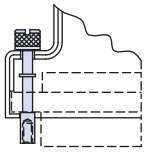




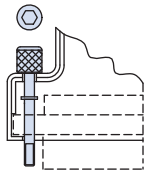
Code K
EMI Band Strap
See Note 2



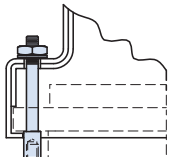
Code T
Qwik-Ty Strain Relief



Code F
Female Jackpost



Code H
Hex Socket Head Screwlock



Code FF
Fixed Female Jackpost

Table I: Dimensions														
Size	A Max.		B		C Max.		D		E		F		G Thread	Available Entry Code Table II
	In.	mm.	In.	mm.	In.	mm.	In. ± .010	mm. ±0.25	In. ± .020	mm. ±.022	In. ± .005	mm. ± .127		
09	.915	23.24	.565	14.35	.450	11.43	.701	17.81	1.013	25.73	.160	4.06	2-56 UNC-2A	04
15	1.065	27.05	.715	18.16	.450	11.43	.763	19.38	1.076	27.33	.190	4.83	2-56 UNC-2A	04-05
21	1.215	30.86	.865	21.97	.450	11.43	.795	20.19	1.107	28.12	.220	5.59	2-56 UNC-2A	04-06
25	1.315	33.40	.965	24.51	.450	11.43	.857	21.77	1.170	29.72	.260	6.60	2-56 UNC-2A	05-08
31	1.465	37.21	1.115	28.32	.450	11.43	.888	22.56	1.201	30.51	.275	6.99	2-56 UNC-2A	05-10
37	1.615	41.02	1.265	32.13	.450	11.43	.951	24.16	1.263	32.08	.285	7.24	2-56 UNC-2A	06-13
51	1.565	39.75	1.215	30.86	.495	12.57	1.013	25.73	1.326	33.68	.350	8.89	2-56 UNC-2A	06-12
51-2	1.965	49.91	1.615	41.02	.450	11.43	1.013	25.73	1.326	33.68	.350	8.89	2-56 UNC-2A	09-16
67	2.365	60.07	2.015	51.18	.450	11.43	1.013	25.73	1.326	33.68	.350	8.89	2-56 UNC-2A	09-16
69	1.865	47.37	1.515	38.48	.495	12.57	1.013	25.73	1.326	33.68	.350	8.89	2-56 UNC-2A	09-16
75	2.210	56.13	1.705	43.31	.495	12.57	1.013	25.73	1.326	33.68	.350	8.89	4-40 UNC-2A	09-16
100	2.305	58.55	1.800	45.72	.540	13.72	1.076	27.33	1.388	35.26	.490	12.45	4-40 UNC-2A	09-16
130	2.665	67.69	2.160	54.86	.540	13.72	1.076	27.33	1.388	35.26	.490	12.45	4-40 UNC-2A	09-16

Dimensions in Inches (millimeters) are subject to change without notice.

Lightweight Saddle Bar Strain-Relief Backshell

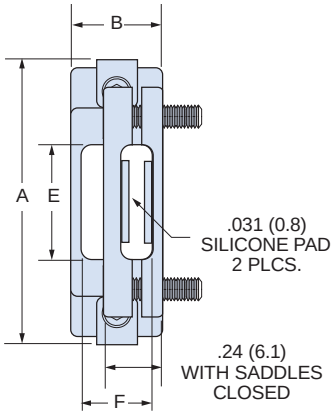
Solid shell, flat-wire bundle top cable entry · 507-198

507-198 Strain Relief Backshells feature saddle bar cable clamps for easy installation.

MATERIALS/FINISH

Backshell: Aluminum alloy
Hardware: CRES / passivated

How To Order Saddle Bar Strain Relief Backshells			
Sample Part Number	**507-198**	**M**	**25**
Series	**507-198**		
Shell Finish	**M** – Electroless Nickel **Z2** – Gold		
Connector Size	**09, 15, 21, 25, 31, 37, 51, 51-2, 67, 69, 100** (See Table I)		



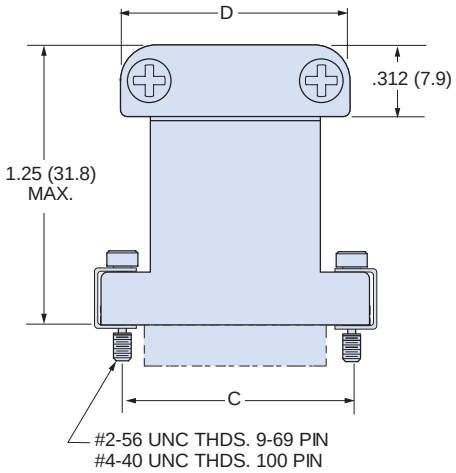


Table I: Dimensions

Size	A Max.		B Max.		C		D Max.		E		F	
	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.
09	.850	21.59	.420	10.67	.565	14.35	.840	21.34	.31	7.87	.31	7.87
15	1.000	25.40	.420	10.67	.715	18.16	.910	23.11	.38	9.65	.31	7.87
21	1.150	29.21	.420	10.67	.865	21.97	.970	24.64	.44	11.18	.31	7.87
25	1.250	31.75	.420	10.67	.965	24.51	1.030	26.16	.50	12.70	.31	7.87
31	1.400	35.56	.420	10.67	1.115	28.32	1.080	27.43	.55	13.97	.31	7.87
37	1.550	39.37	.420	10.67	1.265	32.13	1.130	28.70	.60	15.24	.31	7.87
51	1.500	38.10	.470	11.94	1.215	30.86	1.080	27.43	.55	13.97	.36	9.14
51-2	1.910	48.51	.420	10.67	1.615	41.02	1.480	37.59	.95	24.13	.31	7.87
67	2.310	58.67	.420	10.67	2.015	51.18	1.880	47.75	1.35	34.29	.31	7.87
69	1.810	45.97	.470	11.94	1.515	38.48	1.380	35.05	.85	21.59	.36	9.14
100	2.235	56.77	.510	12.95	1.800	45.72	1.650	41.91	1.00	25.40	.40	10.04

Lightweight Saddle Bar Strain-Relief Backshell

Solid shell, round top cable entry 507-146

SPACE GRADE
NASA
ESA, JAXA
SCREENED

507-146 Strain Relief Backshells feature saddle bar clamps for easy installation.

E-Rings attach the backshell to the Micro-D connector.

MATERIALS/FINISH

Backshell: Aluminum alloy
Hardware: CRES / passivated

How To Order Round Cable Strain Relief Backshells

Sample Part Number	507-146	M	25	H	C

Series	**507-146**
Shell Finish	**M** – Electroless Nickel **Z2** – Gold
Connector Size	**09**, **15**, **21**, **25**, **31**, **37**, **51**, **51-2**, **67**, **69**, **100** (See Table I)
Hardware Option	**OMIT** – Fillister Head Jackscrew **H** – Hex Head Jackscrew **E** – Extended Jackscrew **F** – Jackpost, Female
Jackscrew Attachment Option	**OMIT (Leave Blank)** – Jackscrews Attach With E-Ring. **C** – "C" Clip This Option Applies to Sizes 09 through 69. Size 100 is Not Available with E-Ring.

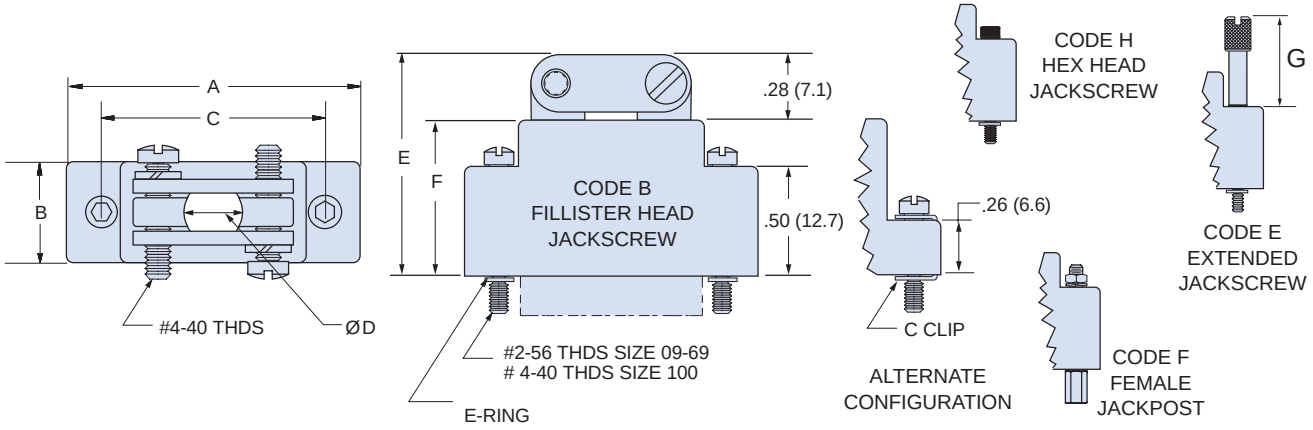


Table I: Dimensions

Size	A Max.		B Max.		C		Ø D		E Max.		F Max.		G Max.	
	In.	mm.	In.	mm.	In.	mm.	In. ± .010	mm. ±0.25	In.	mm.	In.	mm.	In.	mm.
09	.915	23.24	.450	11.43	.565	14.35	.160	4.06	.780	19.81	.550	13.97	.540	13.72
15	1.065	27.05	.450	11.43	.715	18.16	.190	4.83	.830	21.08	.600	15.24	.590	14.99
21	1.215	30.86	.450	11.43	.865	21.97	.220	5.59	.940	23.88	.650	16.51	.700	17.78
25	1.315	33.40	.450	11.43	.965	24.51	.260	6.60	.990	25.15	.700	17.78	.740	18.80
31	1.465	37.21	.450	11.43	1.115	28.32	.275	6.99	1.030	26.16	.740	18.80	.790	20.07
37	1.615	41.02	.450	11.43	1.265	32.13	.285	7.24	1.070	27.18	.780	19.81	.830	21.08
51	1.565	39.75	.495	12.57	1.215	30.86	.350	8.89	1.150	29.21	.860	21.84	.910	23.11
51-2	1.965	49.81	.450	11.43	1.615	41.02	.285	7.24	1.150	29.21	.860	21.84	.910	23.11
67	2.365	60.07	.450	11.43	2.015	51.18	.285	7.24	1.150	29.21	.860	21.84	.910	23.11
69	2.265	57.53	.495	12.57	1.515	38.48	.350	8.89	1.150	29.21	.860	21.84	.910	23.11
100	2.305	58.55	.540	13.72	1.800	45.72	.530	13.46	1.210	30.73	.930	23.62	.970	24.63

Dimensions in Inches (millimeters) are subject to change without notice.

Lightweight Shorting Can Backshell with Lanyard Attachment Options

500-016

How To Order								
Sample Part Number		**500-016**	**M**	**31**	**B**	**F**	**6**	**-01**
Series	**500-016** Shorting can backshell							
Shell Finish	**M** – Electroless Nickel **Z2** – Gold							
Connector Size	**09**, **15**, **21**, **25**, **31**, **37**, **51**, **51-2**, **67**, **69**, **100** (See Table I)							
Hardware Option	**B** – Male Fillister Head **H** – Male Hex Socket **E** – Extended Jackscrew **F** – Jackpost, Female							
Lanyard Attachment	**F** – Wire rope, Nylon jacket **H** – Wire rope, Teflon jacket **R** – Wire rope, PVC jacket **T** – Wire rope, no jacket **N** – no attachment							
Attachment Length	in inches							
Attachment Ring Diameter	See Table II							

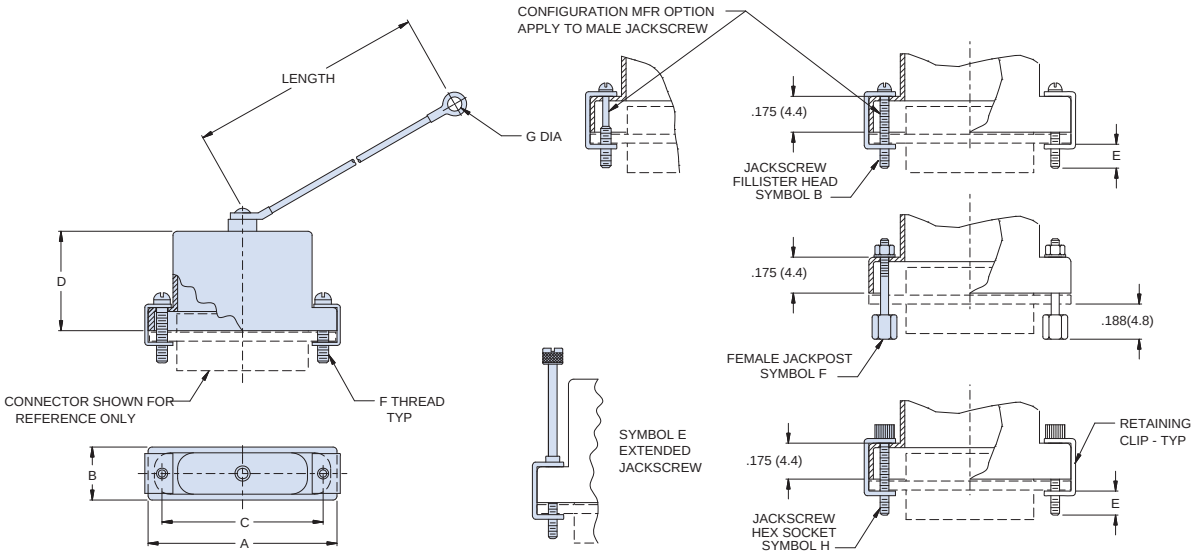


Table II: Lanyard Attachment Ring Diameter	
Dash No.	**G Dia**
00	N/A
01	.146 (3.71)
02	.182 (4.62)
03	.191 (4.85)
04	.197 (5.00)
05	.167 (4.24)
06	.125 (3.18)

Table I						
Shell Size	**A Max**	**B Max**	**C**	**D Max**	**E Ref**	**F Thread**
09	.850 (21.59)	.370 (9.40)	.565 (14.35)	.350 (8.89)	.154 (3.91)	2-56 UNC-2
15	1.000 (25.40)	.370 (9.40)	.715 (18.16)	.470 (11.94)	.154 (3.91)	2-56 UNC-2
21	1.150 (29.21)	.370 (9.40)	.865 (21.97)	.590 (14.99)	.154 (3.91)	2-56 UNC-2
25	1.2550 (31.88)	.370 (9.40)	.965 (24.51)	.650 (16.51)	.154 (3.91)	2-56 UNC-2
31	1.400 (35.56)	.370 (9.40)	1.115 (28.32)	.710 (18.03)	.154 (3.91)	2-56 UNC-2
37	1.550 (39.37)	.370 (9.40)	1.265 (32.13)	.750 (19.05)	.154 (3.91)	2-56 UNC-2
51	1.500 (38.10)	.410 (10.41)	1.215 (30.86)	.780 (19.81)	.154 (3.91)	2-56 UNC-2
51-2*	1.910 (48.51)	.370 (9.40)	1.615 (41.02)	.780 (19.81)	.154 (3.91)	2-56 UNC-2
67	2.310 (58.67)	.370 (9.40)	2.015 (51.18)	.780 (19.81)	.154 (3.91)	2-56 UNC-2
69	1.810 (45.97)	.410 (10.41)	1.515 (38.48)	.780 (19.81)	.154 (3.91)	2-56 UNC-2
100	2.235 (56.77)	.460 (11.68)	1.800 (45.72)	.840 (21.34)	.184 (4.67)	4-40 UNC-2
*51-2 Shell Size is for a special 51 position 2-row Micro-D connector						

MATERIALS

Backshell: Aluminum alloy

Retainer clips, jackscrew: CRES / passivated

Lightweight Potting Shell

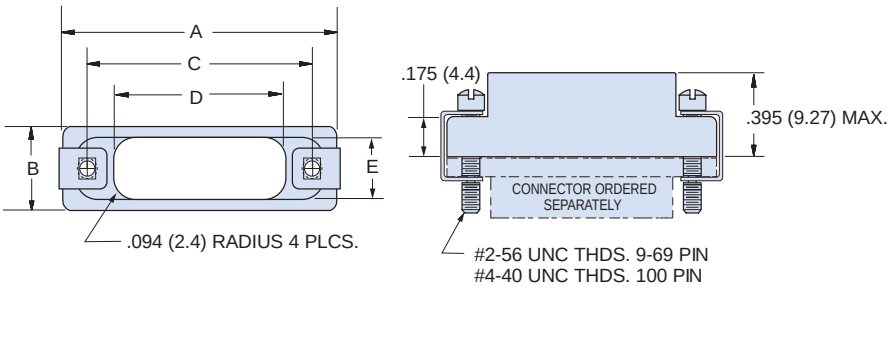
507-035

Potting Shells provide easy encapsulation of Micro-D solder cup terminations. These potting shells provide .25 inches (6.3 mm.) of depth.

MATERIALS/FINISH

Backshell: Aluminum alloy
Hardware: CRES / passivated

How To Order Potting Shells					
Sample Part Number		**507-035**	**M**	**25**	**H**
Series	**507-035**				
Shell Finish	**M** – Electroless Nickel **Z2** – Gold				
Connector Size	**09**, **15**, **21**, **25**, **31**, **37**, **51**, **51-2**, **67**, **69**, **100** (See Table I)				
Hardware Option	**Omit** – Fillister Head Jackscrew **E** – Extended Jackscrew	**H** – Hex Head Jackscrew **F** – Jackpost, Female			



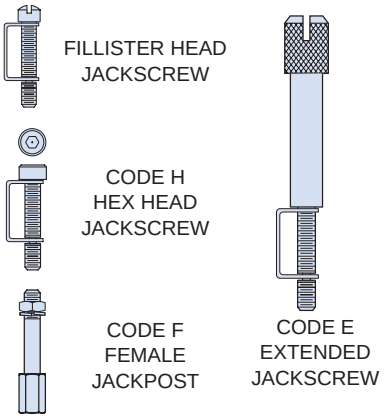


Table I: Dimensions

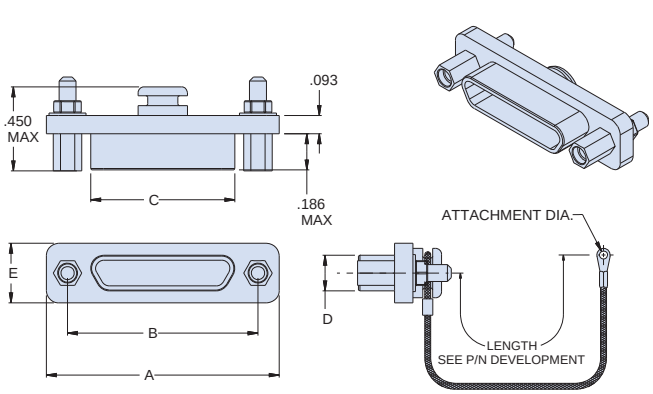
Size	A Max.		B Max.		C		D		E	
	In.	mm.	In.	mm.	In.	mm.	In. ± .030	mm. ±0.8	In. ± .030	mm. ±0.8
09	.850	21.59	.370	9.40	.565	14.35	.31	7.9	.26	6.6
15	1.000	25.40	.370	9.40	.715	18.16	.48	12.2	.26	6.6
21	1.150	29.21	.370	9.40	.865	21.97	.65	16.5	.26	6.6
25	1.250	31.75	.370	9.40	.965	24.51	.75	19.1	.26	6.6
31	1.400	35.56	.370	9.40	1.115	28.32	.88	22.4	.26	6.6
37	1.550	39.37	.370	9.40	1.265	32.13	1.03	26.2	.26	6.6
51	1.500	38.10	.410	10.41	1.215	30.86	.98	24.9	.30	7.6
51-2	1.910	48.51	.370	9.40	1.615	41.02	1.38	35.0	.26	6.6
67	2.310	58.67	.370	9.40	2.015	51.18	1.78	45.2	.26	6.6
69	1.810	45.97	.410	10.41	1.515	38.48	1.28	32.5	.30	7.6
100	2.235	56.77	.460	11.68	1.800	45.72	1.35	34.3	.36	9.1

Environmental Protective Cover with Lanyard Attachment Options

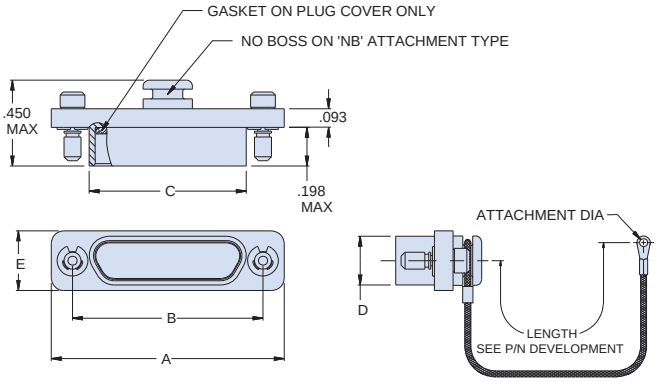
500-107

How To Order									
Sample Part Number	**500-107**	**M**	**25**	**P**	**B**	**N**	**6**	**-01**

Series	**500-107** Protective Cover
Shell Finish	**M** – Electroless Nickel **Z2** – Gold
Size / Layout Code	See Table I
Style	**P** – Plug cover **R** – Receptacle cover
Hardware Option	**B** – No hardware **P** – Female Jackpost **M** – Hexhead Jackscrew **S** – Slotted jackcrew **M1** – Extended hexhead Jackscrew **S1** – Extended slotted Jackscrew **L** – Hexhead non-removable Jackscrew **K** – Extended non-removable Jackscrew
Lanyard Attachment	**F** – Wire rope, Nylon jacket **H** – Wire rope, Teflon jacket **R** – Wire rope, PVC jacket **T** – Wire rope, no jacket **G** – Flexible Nylon rope **N** – no attachment **NB** – No lanyard or attachment boss Attachment to withstand 25 lb. min. pull test
Attachment Length	in inches
Attachment Ring Diameter	See Table II



STYLE R
DUST COVER FOR RECEPTACLE



STYLE P
DUST COVER FOR PLUG

Table II: Lanyard Attachment Ring Diameter	
Dash No.	**Attachment Dia. ±.005 (.13)**
01	.145 (3.68)
02	.182 (4.62)
03	.191 (4.85)
04	.197 (5.00)
05	.167 (4.24)
06	.125 (3.18)

MATERIALS

Backshell: Aluminum alloy
Hardware: CRES / passivated
Gasket: Silicone

Environmental Protective Cover with Lanyard Attachment Options

500-107

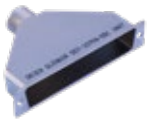
Table I Layout and Dimensions					
Layout	A Max	B ±.003 (.08)	C Max	D Max	E Max
9R	.785 (19.94)	.565 (14.35)	.333 (8.46)	.184 (4.67)	.308 (7.82)
9P	.785 (19.94)	.565 (14.35)	.400 (10.16)	.250 (6.35)	.308 (7.82)
15R	.935 (23.75)	.715 (18.16)	.483 (12.27)	.184 (4.67)	.308 (7.82)
15P	.935 (23.75)	.715 (18.16)	.551 (14.00)	.250 (6.35)	.308 (7.82)
21R	1.085 (27.56)	.865 (21.97)	.633 (16.08)	.184 (4.67)	.308 (7.82)
21P	1.085 (27.56)	.865 (21.97)	.701 (17.81)	.250 (6.35)	.308 (7.82)
25R	1.185 (30.10)	.965 (24.51)	.733 (18.62)	.184 (4.67)	.308 (7.82)
25P	1.185 (30.10)	.965 (24.51)	.801 (20.35)	.250 (6.35)	.308 (7.82)
31R	1.335 (33.91)	1.115 (28.32)	.883 (22.43)	.184 (4.67)	.308 (7.82)
31P	1.335 (33.91)	1.115 (28.32)	.951 (24.16)	.250 (6.35)	.308 (7.82)
37R	1.485 (37.72)	1.265 (32.13)	1.033 (26.24)	.184 (4.67)	.308 (7.82)
37P	1.485 (37.72)	1.265 (32.13)	1.101 (27.97)	.250 (6.35)	.308 (7.82)
51R	1.435 (36.45)	1.215 (30.86)	.983 (24.97)	.228 (5.79)	.351 (8.92)
51P	1.435 (36.45)	1.215 (30.86)	1.051 (26.70)	.296 (7.52)	.351 (8.92)
51-2R*	1.835 (46.61)	1.615 (41.02)	1.384 (35.15)	.184 (4.67)	.308 (7.82)
51-2P*	1.835 (46.61)	1.615 (41.02)	1.450 (36.83)	.250 (6.35)	.308 (7.82)
67R*	2.235 (56.77)	2.015 (51.18)	1.784 (45.31)	.184 (4.67)	.310 (7.87)
67P*	2.235 (56.77)	2.015 (51.18)	1.850 (46.99)	.250 (6.35)	.310 (7.87)
69R**	1.735 (44.07)	1.515 (38.48)	1.284 (32.61)	.228 (5.79)	.351 (8.92)
69P**	1.735 (44.07)	1.515 (38.48)	1.350 (34.29)	.296 (7.52)	.351 (8.92)
75R	2.080 (52.83)	1.705 (43.31)	1.384 (35.15)	.228 (5.79)	.351 (8.92)
75P	2.080 (52.83)	1.705 (43.31)	1.450 (36.83)	.296 (7.52)	.351 (8.92)
100R	2.170 (55.12)	1.800 (45.72)	1.383 (35.13)	.270 (6.86)	.394 (10.01)
100P	2.170 (55.12)	1.800 (45.72)	1.451 (36.86)	.333 (8.46)	.394 (10.01)
130R	2.520 (64.01)	2.160 (54.86)	1.735 (44.07)	.270 (6.86)	.394 (10.01)
130P	2.520 (64.01)	2.160 (54.86)	1.795 (45.59)	.333 (8.46)	.394 (10.01)

*51-2 and 67 Layouts are for a special 2-row Micro-D connector
**69 Layouts are for a special 3-row Micro-D connector

Product Selection Guide

SOLID SHELL LOW-PROFILE FLANGE LIGHTWEIGHT ALUMINUM, TRAPEZOIDAL EMI/RFI BACKSHELLS

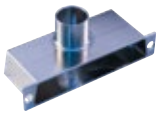
Note: these accessories do not accommodate connectors with flange tabs



557-107
Banding porch platform for shield termination with Band-Master ATS® bands. Top, Round cable entry.
Page 28

557-319
Banding porch platform for shield termination with Band-Master ATS® Standard or Micro bands. Qwik-Ty strain relief option. Round cable entry. Side and 45° entry options.
Page 29

557-108
Banding porch platform for shield termination with Band-Master ATS® Standard or Micro bands. Qwik-Ty strain relief option. Long side, round cable entry.
Page 30



557-109
Banding porch platform for shield termination with Band-Master ATS® Standard or Micro bands. Qwik-Ty strain relief option. Short side, Round cable entry.
Page 31

557-281
Banding porch platform for shield termination with Band-Master ATS® Micro bands. Top, Elliptical cable entry.
Page 32

557-041
Shorting can / potting shell
Page 33

500-008
Protective cover
Page 34

EMI/RFI SPLIT-SHELL STANDARD FLANGE BANDING BACKSHELL WITH REMOVABLE BANDING PORCHES

557-609
Split construction with separable banding platforms (allows inspection of wire-to-connector termination without disrupting cable shield termination). Round or Elliptical cable entries. Configurable with 1, 2, or 3 cable entries. Captive jackscrews.
Page 44

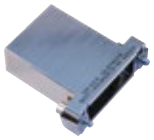
SOLID SHELL STANDARD FLANGE LIGHTWEIGHT ALUMINUM EMI/RFI BACKSHELLS

557-316
Banding porch platform for shield termination with Band-Master ATS® bands. Qwik-Ty strain relief option. Round or Elliptical, Top, Side, End, and 45° cable entry options
Page 36

557-080
Banding porch platform for shield termination with Band-Master ATS® bands. Dual, Top, Round cable entry
Page 38

557-387
Cone-and-ring shield termination (non-banding). Strain-relief cable clamp. Round cable entry. Top, Side, or End entry options
Page 39

557-467
Saddle bar clamp with silicone pads for easy installation of flat cable bundle
Page 40

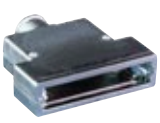


557-493
Shorting can backshell for protection of stand-alone connectors. Lightweight aluminum with lanyard attachment options.
Page 42

557T316
Shorting can backshell for protection of stand-alone connectors. Lightweight aluminum.
Page 43

SPLIT SHELL EMI/RFI BACKSHELLS WITH VARIABLE-LENGTH SHROUD FOR CONNECTOR PROTECTION. FOR PANEL OR CABLE CONNECTORS

550-039
Aluminum construction with banding porch platform for shield termination with Band-Master ATS® bands. Top, Side, and End Round cable entry. For panel mount and cable-to-cable connectors.
Page 46



557-186
Lightweight composite thermoplastic construction with banding porch platform for shield termination with Band-Master ATS® bands. Top, Side, and End Round cable entry. For panel mount and cable-to-cable connectors.
Page 48

Product Selection Guide

SPACE GRADE
NASA
ESA, JAXA
SCREENED

LIGHTWEIGHT, LOW-PROFILE BACKSHELLS FOR GLENAIR SIGNATURE SERIES 28 HIPER-D HIGH-PERFORMANCE M24308 INTERMATEABLE CONNECTORS

289-005
Low profile split shell EMI backshell, Elliptical entry. Top and Side entry options
Page 50

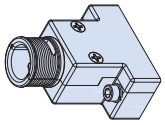
289-008
Low profile solid shell EMI backshell, Elliptical entry. Top and Side entry options
Page 53

289-007
Low profile solid shell EMI backshell, Elliptical entry, panel mount. Top, Side, and 45° entry options
Page 56

ESA/ESCC-TO-GLENAIR PART NUMBER CROSS-REFERENCE

For space-grade ESA-specified rectangular connectors 3401/001 and /002
Page 60

GLENAIR IMPROVED DESIGNS FOR REMOVABLE-ENTRY AND CABLE CLAMP RECTANGULAR BACKSHELLS



557-652 • 557-653
Glenair's improved-design two-piece backshells, with IS-Sommer cross-reference
Page 66

D -Subminiature Backshell Selection Guide

	Backshell Type					Cable Entry								Hardware						Other	
	EMI backshell	Available in Lightweight Composite	Strain Relief Backshell	Potting Shell / Shorting Can	Protective Cover	Circular Cable Entry	Elliptical Cable Entry	Straight Cable Entry	45° Cable Entry	Side Cable Entry	Slot Head Jackscrews	Hex Head Jackscrews	Extended Jackscrews	Screw Locks Instead of Jackscrews	One Piece Backshell	Split (Two Piece) Backshell	Accepts Standard Shield Band	Accepts Micro Shield Band	Connector Attaches with Clip	Connector Attaches with E-Ring	Connector is Captivated by Backshell	Page No.
557-107	●					●		●			●	●	●		●		●	●	●				28
557-319	●					●			●	●	●	●			●		●	●	●				29
557-108	●					●				●	●	●			●		●	●	●				30
557-109	●					●				●	●	●	●		●		●	●	●				31
557-281	●						●	●				●			●			●	●				32
557-041				●											●				●				33
500-008					●						●	●	●		●								34
557-609	●					●	●	●						●		●	●	●				●	44
557-316	●					●	●	●	●	●	●	●			●		●	●	●	●			36
557-080	●					●		●				●			●		●	●		●			38
557-387	●		●			●		●		●		●			●				●				39
557-467			●					●			●	●	●		●				●	●			40
557-493				●							●	●			●				●				42
557T316				●							●	●			●				●	●			43
550-039	●					●		●		●	●	●	●			●	●	●				●	46
557-186	●	●				●		●		●	●	●	●			●	●	●				●	48
289-005	●						●	●		●		●	●	●		●	●	●				●	50
289-008	●						●	●		●		●			●		●	●	●				53
289-007	●						●	●	●	●					●		●	●	●	●			56

Application Notes

About D-Subminiature Backshells

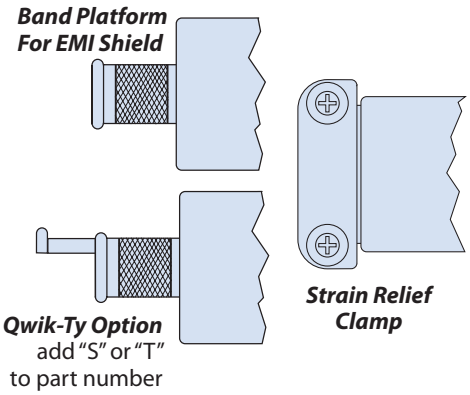
D-Sub EMI backshells are used to ground cable shields for electromagnetic compatibility, and to provide strain relief and mechanical protection of wire-to-connector terminations. These backshells are made out of aluminum alloy or composite thermoplastic. Electroless nickel is the most widely used finish. These backshells are compatible with industry-standard metal shell M24308 type connectors. The following application notes explain how to select the right type of backshell.

EMI Versus Non-EMI Backshells

Select EMI backshells if your cable has a braided shield or screen. The cable shield must be terminated to the backshell for electromagnetic compatiblity (EMC). Glenair recommends Band-Master ATS® Micro bands, supplied with the backshell or purchased separately for reliable shield termination.

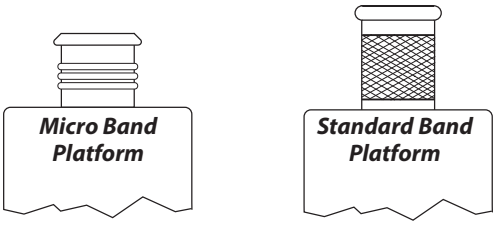
Select a strain relief backshell to prevent wire-to-connector terminations from inadvertent removal due to vibration, shock, or handling.

EMI backshells with Band-Master ATS® shield terminations do not normally require additional strain relief. For non-EMI/RFI applications, saddle bar strain relief clamps are available. Qwik-Ty legs are available for most of the EMI/RFI banding backshells for additional light-duty strain relief.



Standard Band Versus Micro Band

Most D-Sub EMI backshells feature low-profile band platforms designed for a narrow (.125" width) Micro Band. Some have a taller band platform which also accepts standard-width bands (.250" width).



One-Piece versus Split-Shell Backshells

Split-shell backshells allow for easy installation over already terminated wires. Some split backshells fit over the connector, eliminating the magnetic clip component. Split-shell versions also can accommodate screw locks. One-piece backshells must be staged on the wire bundle prior to final wire-to-connector termination.

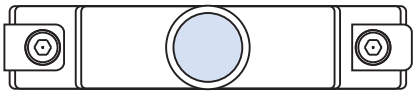
Jackscrews and Screwlocks

Jackscrews are fixed in position and are used to drive connectors together during mating. Screwlocks float and allow the connectors to be coupled manually before the screwlocks are engaged. Screwlocks allow faster mating, while jackscrews offer less risk of contact damage.

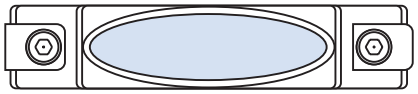
Elliptical Versus Circular Cable Entry

Choose elliptical backshells if the wire bundle diameter is too big to fit in a circular cable entry. High-density D-Sub connectors will benefit from elliptical cable entry backshells due to the larger wire count. Even standard density D-Subs with 50 wires may exceed the limits of the round entries.

The illustrations to the right show the difference between round and elliptical cable entries. The round entry cross-sectional area = $\pi(\frac{1}{2}D)^2 = .11$ In.^{2}. The formula for the area of an ellipse is π(Length)(Width) $\div$ 4 = .36 In.^{2}



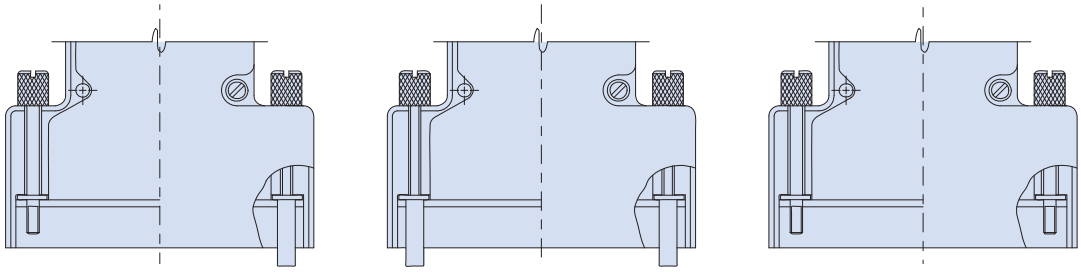
Round Cable Entry
.375 Inch (9.5mm) diameter



Elliptical Cable Entry
.360 By 1.29 Inch (9.1 X 32.8 mm.)

SPLIT-SHELL HARDWARE OPTIONS 550-039 AND 557-186 ONLY

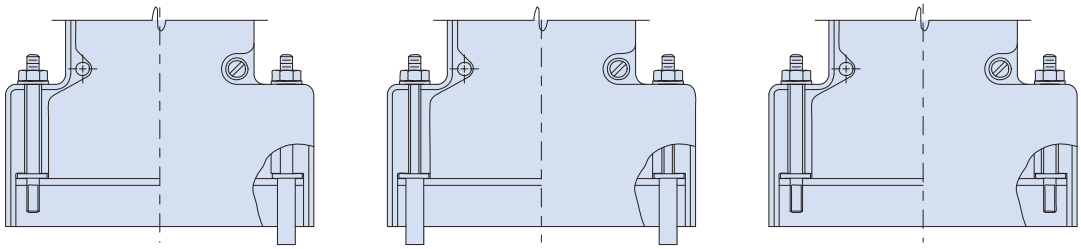
POLARIZING JACKSCREW OPTIONS



TYPE F
TURNABLE MALE & FEMALE

TYPE L
TURNABLE FEMALES

TYPE M
TURNABLE MALES

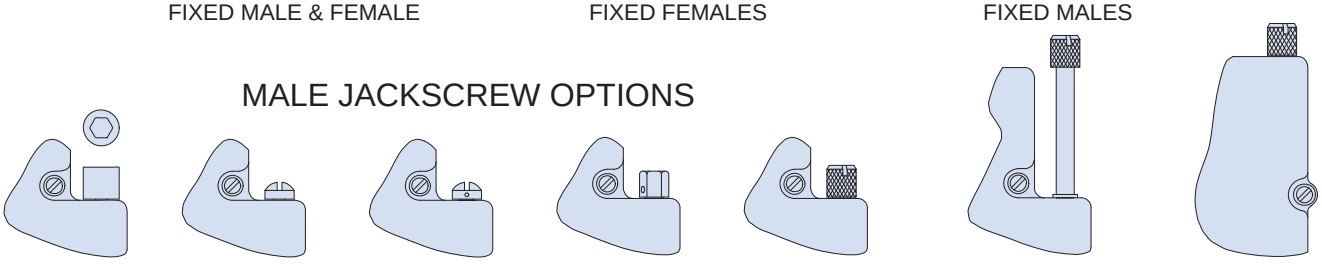


TYPE N
FIXED MALE & FEMALE

TYPE P
FIXED FEMALES

TYPE R
FIXED MALES

MALE JACKSCREW OPTIONS



TYPE A
HEX SOCKET
HEAD

TYPE B
FILLISTER
HEAD

TYPE D
DRILLED
FILLISTER HEAD

TYPE H
HEX HEAD

TYPE K*
KNURLED
SLOTTED HEAD

TYPE E*
EXTENDED KNURLED
SLOTTED HEAD

TYPE J
KNURLED
SLOTTED HEAD

Unless otherwise noted, all jackscrews have 4-40 UNC-2A threads to mate with M24308/26 female screwlocks or 559-001 mounting kits.
(Not applicable for cable-to-cable applications.)
* Not available for Style "E" (end entry backshells).

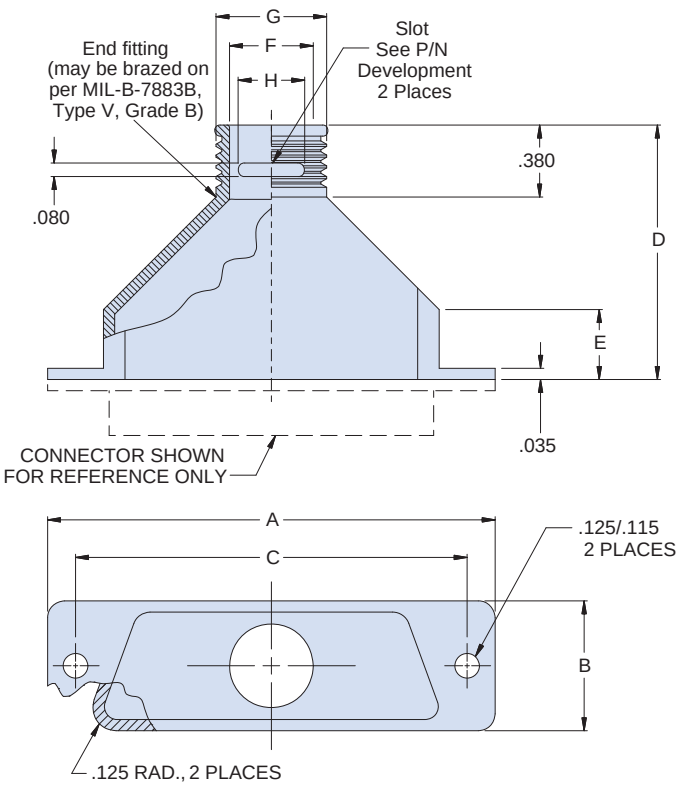
Space-Grade Finish Options			
Finish Code	**Description**	**Specification**	**Corresponding Connector Finish Code**
M / ME	Electroless Nickel	SAE-AMS-26074 Class 3	Code 2
XM	Electroless Nickel (Composite Only)	SAE-AMS-26074 Class 3	Code 2
Z2	Gold Plated	ASTM B488	Code 5

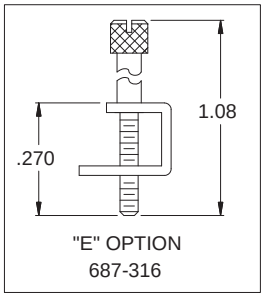
Materials	
Shell, Saddle Clamps	Aluminum Alloy 6061 -T6 Per QQ-A-200, QQ-A-225 (Machined Components) Aluminum Alloy 6061-T6 Per QQ-A-591 (A380) (Die-Cast Components)
Clips, E-Rings	17-7PH Stainless Steel
Jackscrews, Washers, Jackposts	300 Series Stainless Steel, Passivated

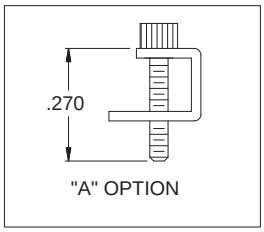
Lightweight, Low-Profile EMI/RFI Backshell

Solid shell, top, round cable entry · 557-107

How To Order							
Sample Part Number	**557-107**	**M**	**2**	**-03**	**C**	**B**	**S**
Basic Part No.	D-Subminiature Lightweight Banding Backshell						
Finish Symbol	**M** = Electroless Nickel **Z2** = Gold Plate						
Shell Size	**1**, **2**, **3**, **4**, **5**, **6** (Table I)						
Cable Entry Size	**01**, **02**, **03**, **04**, **05**, **06**, **07**, **08**, **09** (Table II)						
Jackscrew Options	**A** = Hex Socket Head **C** = Fillister Head **E** = Extended Slotted Jackscrew **Omit** for none						
Band Option	**B** = Standard Band Supplied **Omit** for none						
Slots	**S** = with Slots **Omit** for none						







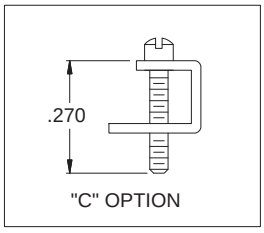


Table II: Cable Entry			
Entry Size	F	G	H
01	.125 (3.2)	.205 (5.2)	.09 (2.3)
02	.187 (4.7)	.267 (6.8)	.19 (4.8)
03	.265 (6.7)	.360 (9.1)	.22 (5.6)
04	.312 (7.9)	.392 (10.0)	.25 (6.4)
05	.390 (9.9)	.485 (12.3)	.28 (7.1)
06	.415 (10.5)	.510 (13.0)	.31 (7.9)
07	.500 (12.7)	.580 (14.7)	.31 (7.9)
08	.525 (13.3)	.620 (15.7)	.38 (9.7)
09	.595 (15.1)	.690 (17.5)	.38 (9.7)

Table I: Shell Size and Connector Interface Dimensions						
Shell Size	A	B	C±.005	D	E	Max Entry Size
1	1.203 (30.6)	0.500 (12.7)	0.984 (25.0)	1.190 (30.2)	0.440 (11.2)	06
2	1.531 (38.9)	0.500 (12.7)	1.312 (33.3)	1.270 (32.3)	0.440 (11.2)	06
3	2.078 (52.8)	0.500 (12.7)	1.852 (47.0)	1.550 (39.4)	0.500 (12.7)	06
4	2.718 (69.0)	0.500 (12.7)	2.500 (63.5)	1.690 (42.9)	0.500 (12.7)	06
5	2.625 (66.7)	0.609 (15.5)	2.406 (61.1)	1.670 (42.4)	0.440 (11.2)	08
6	2.718 (69.0)	0.668 (17.0)	2.500 (63.5)	1.690 (42.9)	0.500 (12.7)	09

MATERIALS

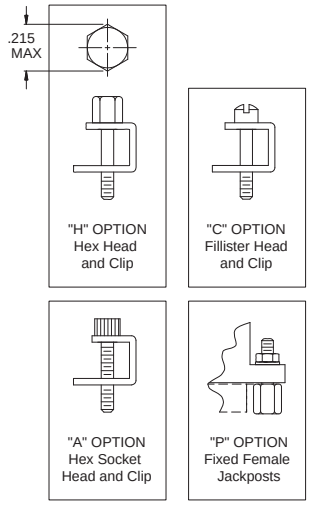
Backshell: Aluminum alloy
Retainer clips, jackscrew: CRES / passivated

Lightweight, Low-Profile EMI/RFI Backshell with Qwik-Ty option

Solid shell, 90° and 45° round cable entry · 557-319

SPACE GRADE
NASA
ESA, JAXA
SCREENED

How To Order								
Sample Part Number	**557B319**	**M**	**2**	**03**	**C**	**B**	**G**	**-T**
Series	**557B319** - 45° Entry **557E319** - Side Entry (90°)							
Finish Symbol	**M** = Electroless Nickel **Z2** = Gold Plate							
Shell Size	**1**, **2**, **3**, **4**, **5**, **6** (Table I)							
Entry Size	**01**, **02**, **03**, **04**, **05**, **06**, **07**, **08**, **09** (Table II)							
Jackscrew Option	**A** = Hex Socket Head and Clip **C** = Fillister Head and Clip **H** = Hex Head and Clip **P** = Fixed Female Jackposts **Omit** for none							
EMI Band Option	**B** = Micro Band supplied **Omit** for none							
EMI Gasket Option	**G** = Supplied with Gasket **Omit** for none							
Qwik-Ty Option	**-T** = Supplied with Qwik-Ty **Omit** for none							



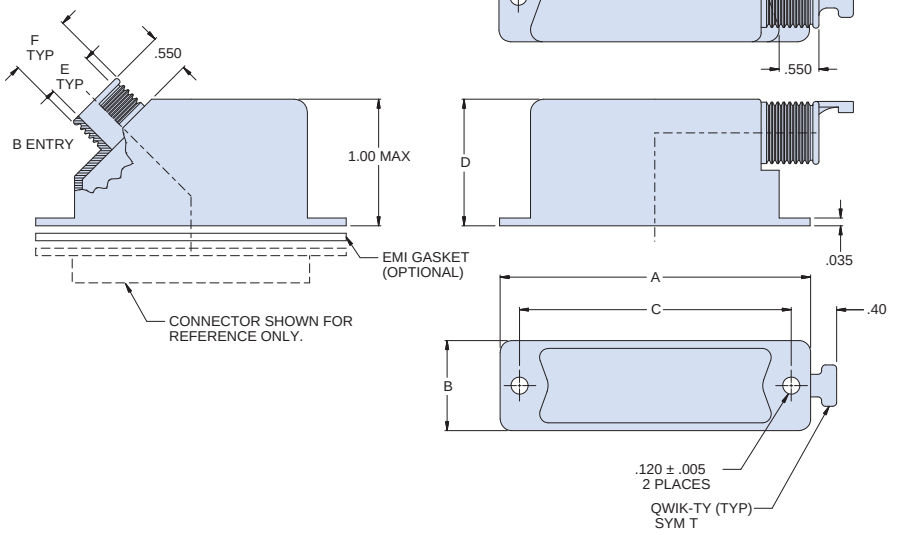


Table II: Cable Entry		
Entry Size	**E**	**F**
01	.125 (3.2)	.205 (5.2)
02	.187 (4.7)	.267 (6.8)
03	.265 (6.7)	.360 (9.1)
04	.312 (7.9)	.392 (10.0)
05	.390 (9.9)	.485 (12.3)
06	.415 (10.5)	.510 (13.0)
07	.500 (12.7)	.580 (14.7)
08	.525 (13.3)	.620 (15.7)
09	.570 (14.5)	.665 (16.9)

Table I: Shell Size					
Shell Size	**A**	**B**	**C ±.005 (0.1)**	**D ±.015 (0.4)**	**Max Entry Size**
1	1.203 (30.6)	.520 (13.2)	.984 (25.0)	1.000 (24.5)	06
2	1.531 (38.9)	.520 (13.2)	1.312 (33.3)	1.125 (28.6)	06
3	2.078 (52.8)	.520 (13.2)	1.852 (47.0)	1.188 (30.2)	06
4	2.718 (69.0)	.520 (13.2)	2.500 (63.5)	1.188 (30.2)	06
5	2.625 (66.7)	.629 (16.0)	2.406 (61.1)	1.312 (33.3)	08
6	2.718 (69.0)	.690 (17.5)	2.500 (63.5)	1.312 (33.3)	09

MATERIALS

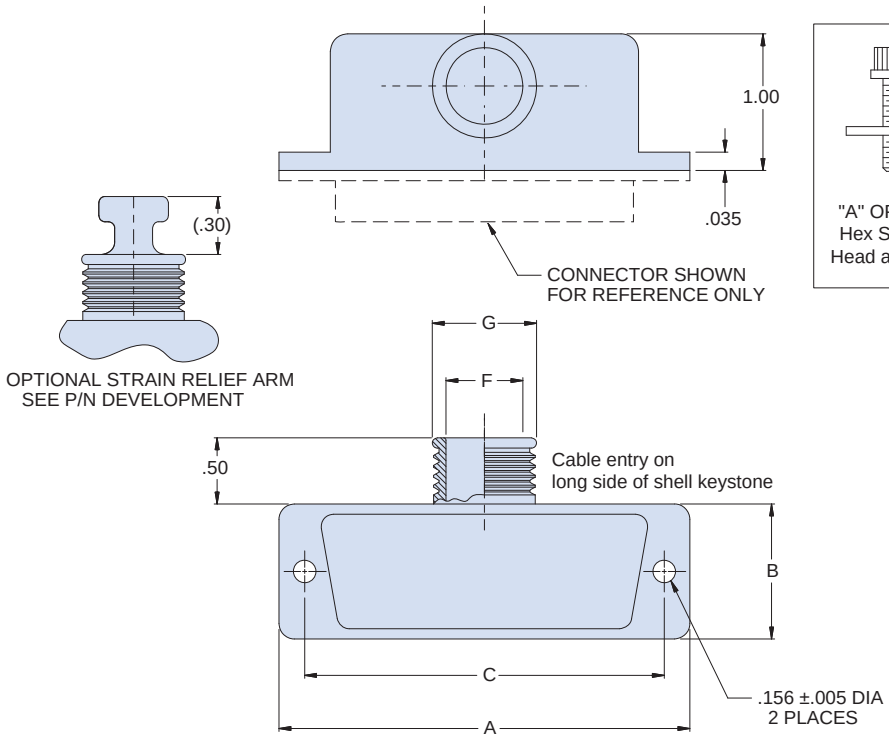
Backshell: Aluminum alloy
Hardware: CRES / passivated
EMI gasket: Metalastic

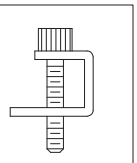
Dimensions in Inches (millimeters) are subject to change without notice.

Lightweight, Low-Profile EMI/RFI Backshell with Qwik-Ty option

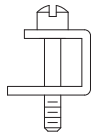
Solid shell, long side cable entry · 557-108

How To Order							
Sample Part Number	**557-108**	**M**	**2**	**04**	**C**	**S**	
Series	Side Entry backshell						
Finish Symbol	**M** = Electroless Nickel **Z2** = Gold Plate						
Shell Size	**1**, **2**, **3**, **4**, **5** (Table I)						
Entry Size	**01**, **02**, **03**, **04**, **05**, **06**, **07**, **08**, **09** (Table II)						
Jackscrew Option	**A** = Hex Socket Head and Clip **C** = Fillister Head and Clip **CR** = Phillips Head and Clip **Omit** for none						
Qwik-Ty Option	**S** = With Qwik-Ty strain relief arm **Omit** for none						

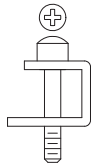




"A" OPTION
Hex Socket
Head and Clip



"C" OPTION
Fillister Head
and Clip



"CR" OPTION
Phillips Head
and Clip

Table II: Cable Entry		
Entry Size	F Dia.	G Dia.
01	.125 (3.18)	.205 (5.21)
02	.187 (4.75)	.267 (6.78)
03	.270 (6.86)	.350 (8.89)
04	.290 (7.37)	.370 (9.40)
05	.312 (7.92)	.392 (9.96)
06	.395 (10.03)	.475 (12.07)
07	.420 (10.67)	.500 (12.70)
08	.500 (12.70)	.580 (14.73)
09	.529 (13.44)	.609 (15.47)

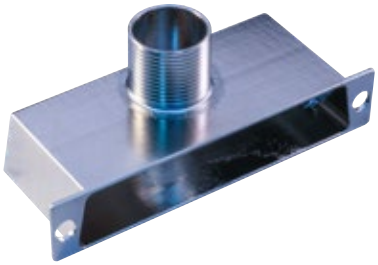
Table I: Shell Size			
Shell Size	A	B	C ±.005 (0.1)
1	1.203 (30.6)	.500 (12.7)	.984 (25.0)
2	1.531 (38.9)	.500 (12.7)	1.312 (33.3)
3	2.078 (52.8)	.500 (12.7)	1.852 (47.0)
4	2.718 (69.0)	.500 (12.7)	2.500 (63.5)
5	2.625 (66.7)	.609 (15.5)	2.406 (61.1)

MATERIAL/FINISH

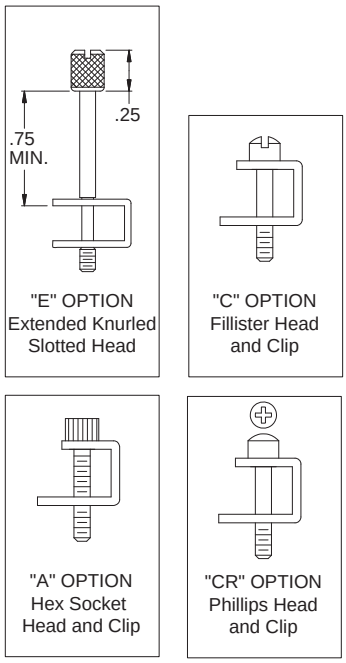
Backshell: Aluminum alloy
Hardware: CRES / passivated

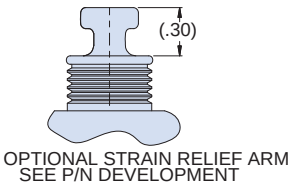
Lightweight, Low-Profile EMI/RFI Backshell with Qwik-Ty option

Solid shell, short side cable entry · 557-109



How To Order						
Sample Part Number	**557-109**	**M**	**2**	**04**	**C**	**S**
Series	Side Entry backshell					
Finish Symbol	**M** = Electroless Nickel **Z2** = Gold Plate					
Shell Size	**1**, **2**, **3**, **4**, **5** (Table I)					
Entry Size	**01**, **02**, **03**, **04**, **05**, **06**, **07**, **08**, **09** (Table II)					
Jackscrew Option	**A** = Hex Socket Head and Clip **C** = Fillister Head and Clip **CR** = Phillips Head and Clip **E** = Extended Knurled Slotted Head **Omit** for none					
Qwik-Ty Option	**S** = With Qwik-Ty strain relief arm **Omit** for none					





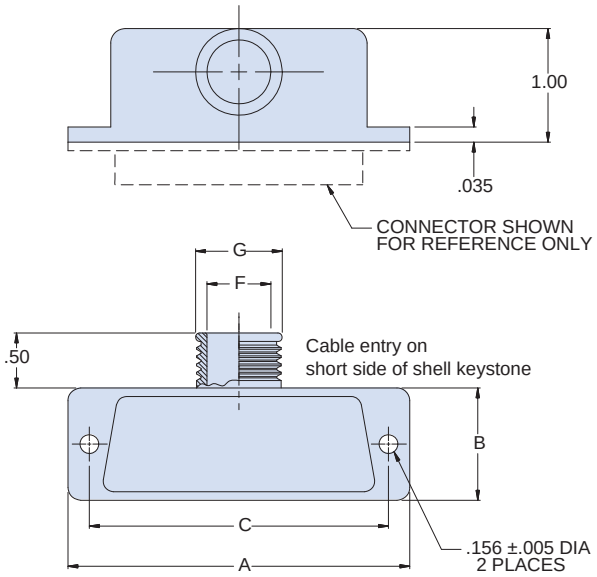


Table II: Cable Entry		
Entry Size	**F Dia.**	**G Dia.**
01	.125 (3.18)	.205 (5.21)
02	.187 (4.75)	.267 (6.78)
03	.270 (6.86)	.350 (8.89)
04	.290 (7.37)	.370 (9.40)
05	.312 (7.92)	.392 (9.96)
06	.395 (10.03)	.475 (12.07)
07	.420 (10.67)	.500 (12.70)
08	.500 (12.70)	.580 (14.73)
09	.529 (13.44)	.609 (15.47)

Table I: Shell Size			
Shell Size	**A**	**B**	**C ±.005 (0.1)**
1	1.203 (30.6)	.500 (12.7)	.984 (25.0)
2	1.531 (38.9)	.500 (12.7)	1.312 (33.3)
3	2.078 (52.8)	.500 (12.7)	1.852 (47.0)
4	2.718 (69.0)	.500 (12.7)	2.500 (63.5)
5	2.625 (66.7)	.609 (15.5)	2.406 (61.1)

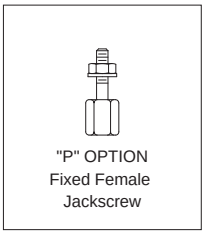
MATERIAL/FINISH

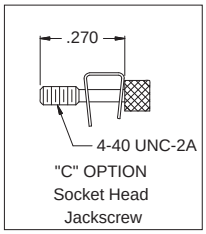
Backshell: Aluminum alloy
Hardware: CRES / passivated

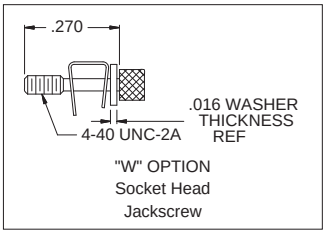
Lightweight, Low-Profile EMI/RFI Backshell with Micro Banding Porch and Qwik-Ty Option

Solid shell, top elliptical cable entry · 557-281

How To Order							
Sample Part Number	**557-281**	**M**	**5**	**04**	**B**	**S**	**C**
Series	**557-281** Top Oval Entry backshell						
Finish Symbol	**M** = Electroless Nickel **Z2** = Gold Plate						
Shell Size	**1**, **2**, **3**, **4**, **5**, **6** (Table I)						
Entry Size	**04**, **05**, **06**, **07**, **08**, **09**, **10**, **11**, **12**, **13**, **14**, **15**, **16** (Table III)						
Height Code	**A**, **B**, **C**, **D**, **E**, **F**, **G**, **H** (Table IV)						
Qwik-Ty Option	**S** = With Qwik-Ty strain relief arm **Omit** for none						
Hardware Option	**C** = Fillister Head **W** = Socket Head Jackscrew **P** = Fixed Female Jackscrew **Omit** for none						







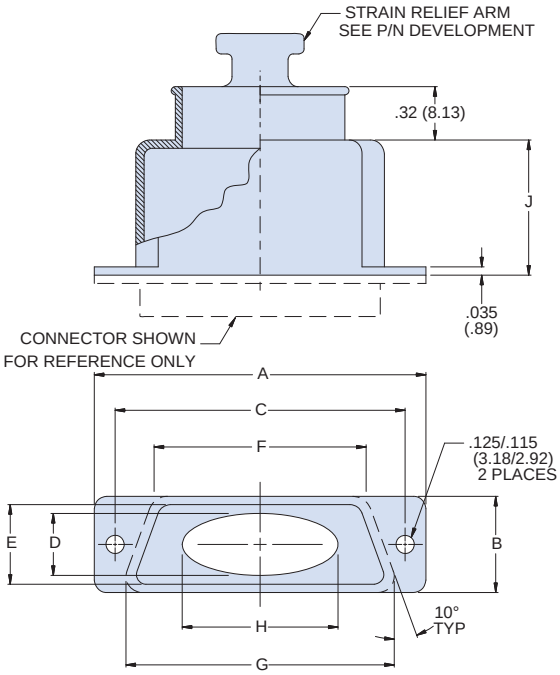


Table III: Cable Entry	
Entry Size	**H**
04	.500 (12.70)
05	.625 (15.88)
06	.750 (19.05)
07	.875 (22.23)
08	1.000 (25.40)
09	1.125 (28.58)
10	1.250 (31.75)
11	1.375 (34.92)
12	1.500 (38.10)
13	1.625 (41.28)
14	1.750 (44.45)
15	1.875 (47.63)
16	2.000 (50.80)

Table IV: Height Code	
Height Code	**J**
A	.50 (12.70)
B	.62 (15.75)
C	.75 (19.05)
D	.87 (22.10)
E	1.00 (25.40)
F	1.12 (28.45)
G	1.25 (31.75)
H	1.38 (35.05)

Table I: Shell Size								
Shell Size	**A**	**B**	**C ±.005 (0.13)**	**D**	**E**	**F Ref.**	**G ±.030 (.762)**	**Max Entry Size**
1	1.203 (30.56)	.500 (12.70)	.984 (24.99)	.375 (9.52)	.467 (11.86)	.639 (16.23)	.839 (21.31)	05
2	1.531 (38.88)	.500 (12.70)	1.312 (33.32)	.375 (9.52)	.467 (11.86)	.978 (24.84)	1.178 (29.92)	08
3	2.078 (52.78)	.500 (12.70)	1.852 (47.04)	.375 (9.52)	.467 (11.86)	1.507 (38.28)	1.706 (43.33)	12
4	2.718 (69.04)	.500 (12.70)	2.500 (63.50)	.375 (9.52)	.467 (11.86)	2.163 (54.94)	2.364 (60.05)	16
5	2.625 (66.68)	.609 (15.47)	2.406 (61.11)	.484 (12.29)	.579 (14.71)	2.053 (52.15)	2.291 (58.19)	16
6	2.780 (70.61)	.670 (17.02)	2.500 (63.50)	.554 (14.07)	.621 (15.77)	2.185 (55.50)	2.421 (61.49)	16

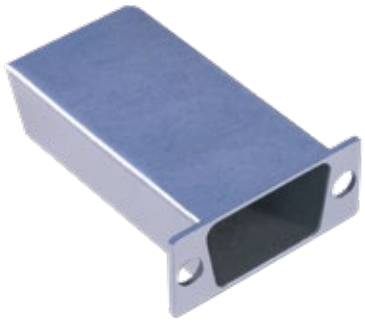
MATERIALS

Backshell: Aluminum alloy
Hardware: CRES / passivated

Lightweight, Low-Profile Shorting Can / Potting Cup

557-041

SPACE GRADE
NASA
ESA, JAXA
SCREENED



How To Order					
Sample Part Number		**557-041**	**–2**	**S**	**M**
Series	**557-041** Shorting Can / Potting Cup				
Shell Size	**1**, **2**, **3**, **4**, **5**, **6** (Table I)				
Style	**S** = Shorting Can **P** = Potting Cup				
Finish Symbol	**M** = Electroless Nickel **Omit** for Gold Plate				

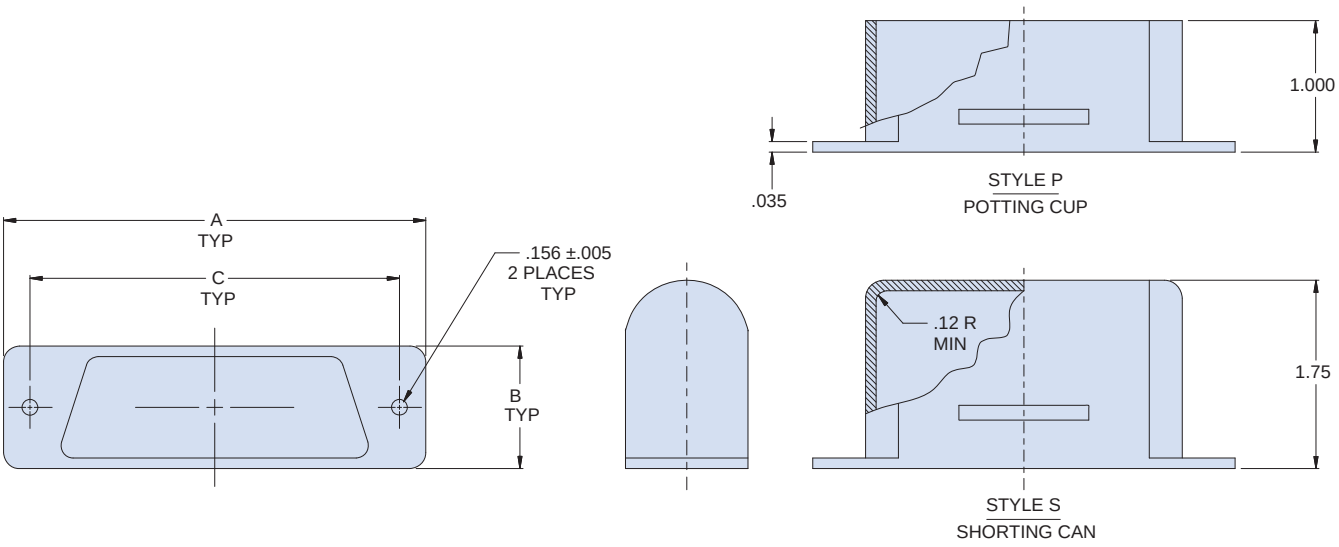


Table I: Shell Size			
Shell Size	A	B	C ±.005 (0.13)
1	1.203 (30.56)	.500 (12.70)	.984 (24.99)
2	1.531 (38.88)	.500 (12.70)	1.312 (33.32)
3	2.078 (52.78)	.500 (12.70)	1.852 (47.04)
4	2.718 (69.04)	.500 (12.70)	2.500 (63.50)
5	2.625 (66.68)	.609 (15.47)	2.406 (61.11)
6	2.730 (69.34)	.668 (16.97)	2.500 (63.50)

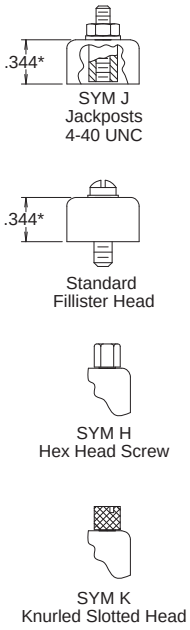
MATERIAL/FINISH

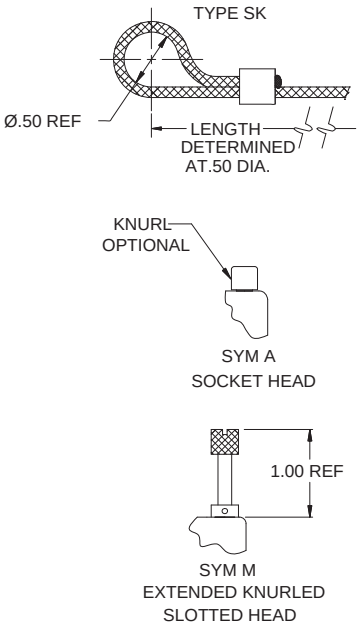
Backshell: Aluminum alloy
Hardware: CRES / passivated

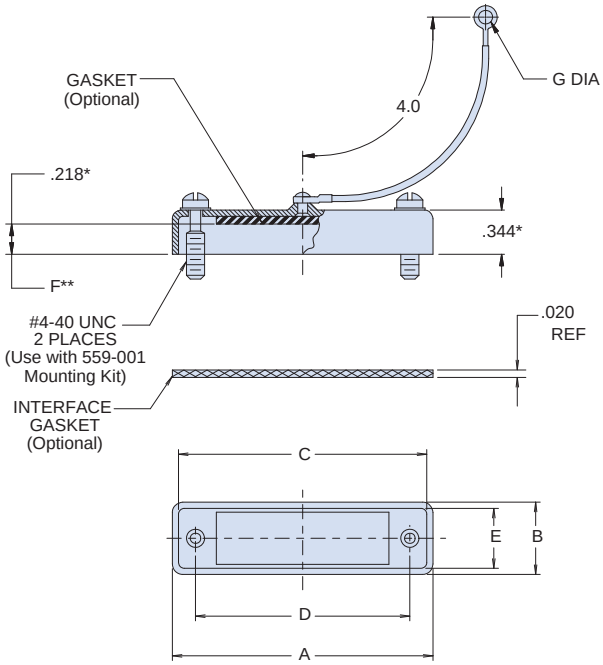
Environmental Protective Cover with Lanyard Attachment Options

500-008

How To Order										
Sample Part Number	**500-008**	**M**	**1**	**R3**	**G**	**A**	**L**	**-01**	**-6**
Series	Protective Cover									
Finish Symbol	**M** = Electroless Nickel **Z2** = Gold Plate									
Shell Size	**1**, **2**, **3**, **4**, **5**, **6** (Table I)									
Rear Mount Dash No.	**R1**, **R2**, **R3**, **R4**, **R5**, **R6**, **R7**, **R8** (Table II) **Omit** for front mount									
Interface and Seal Gaskets	**G** = Interface Gasket and Seal Gasket **Omit** = Seal Gasket Only **–** = No Gaskets									
Jackscrew Option	**A** = Socket Head **H** = Hex Head Screw **J** = Jackposts **K** = Slotted Head **M** = Extended Slotted Head **Omit** = Standard Fillister Head									
Attachment Type	See Table V, **Omit** for Standard Wire Rope, Nylon Jacket									
Attachment Dia.	**See** Table III, Omit for Standard .182 or for Attachment Type SK Nylon Rope with Slip Knot									
Attachment Length	Length in Inches. **Omit** for Standard 4"									







* Dimension for front-mounted connectors only.
Dimensions are shorter for rear-mounted connectors

** Dimensions for rear-mounted connectors only.

MATERIALS

Cover: Aluminum alloy
Hardware: CRES / passivated
Seal Gasket: Silicone Interface Gasket: Metalastic

Environmental Protective Cover with Lanyard Attachment Options

500-008

SPACE GRADE NASA ESA, JAXA SCREENED

Table I: Shell Size					
Shell Size	A Max	B Max	C Ref	D ±.005 (0.13)	E Ref.
1	1.39 (35.31)	.51 (12.95)	1.23 (31.24)	.984 (24.99)	.41 (10.41)
2	1.72 (43.69)	.51 (12.95)	1.56 (39.62)	1.312 (33.32)	.41 (10.41)
3	2.26 (57.40)	.51 (12.95)	2.10 (53.34)	1.852 (47.04)	.41 (10.41)
4	2.90 (73.66)	.51 (12.95)	2.74 (69.60)	2.500 (63.50)	.41 (10.41)
5	2.81 (71.37)	.62 (15.75)	2.65 (67.31)	2.406 (61.11)	.52 (13.21)
6	2.90 (73.66)	.68 (17.27)	2.74 (69.60)	2.500 (63.50)	.58 (14.73)

Table II: Rear-Mount Dimensions		
Dash No.	F	Panel Thickness
R1	.187 (4.75)	.031 (0.79)
R2	.171 (4.34)	.047 (1.19)
R3	.156 (3.96)	.062 (1.57)
R4	.125 (3.18)	.093 (2.36)
R5	.114 (2.90)	.104 (2.64)
R6	.093 (2.36)	.125 (3.18)
R7	.062 (1.57)	.156 (3.96)
R8	.080 (2.03)	.138 (3.51)

Table III: Optional Attachment Diameter	
Dash No.	G Dia
01	.145 (3.68)
[omit]	.182 (4.62)
04	.197 (5.00)
06	.125 (3.18)

Table V: Attachment Type	
Sym.	Attachment Type
D	Bead chain, CRES, passivated
[omit]	Wire rope, Nylon jacket
E	Wire rope, Teflon jacket
L	Attachment omitted
R	Wire rope, PVC jacket
T	Wire rope, no jacket
S	#8 sash chain, CRES, passivated
U	Wire rope, Polyurethane jacket with terminal
Z	Nylon rope
SK	Nylon rope (black) with slip knot

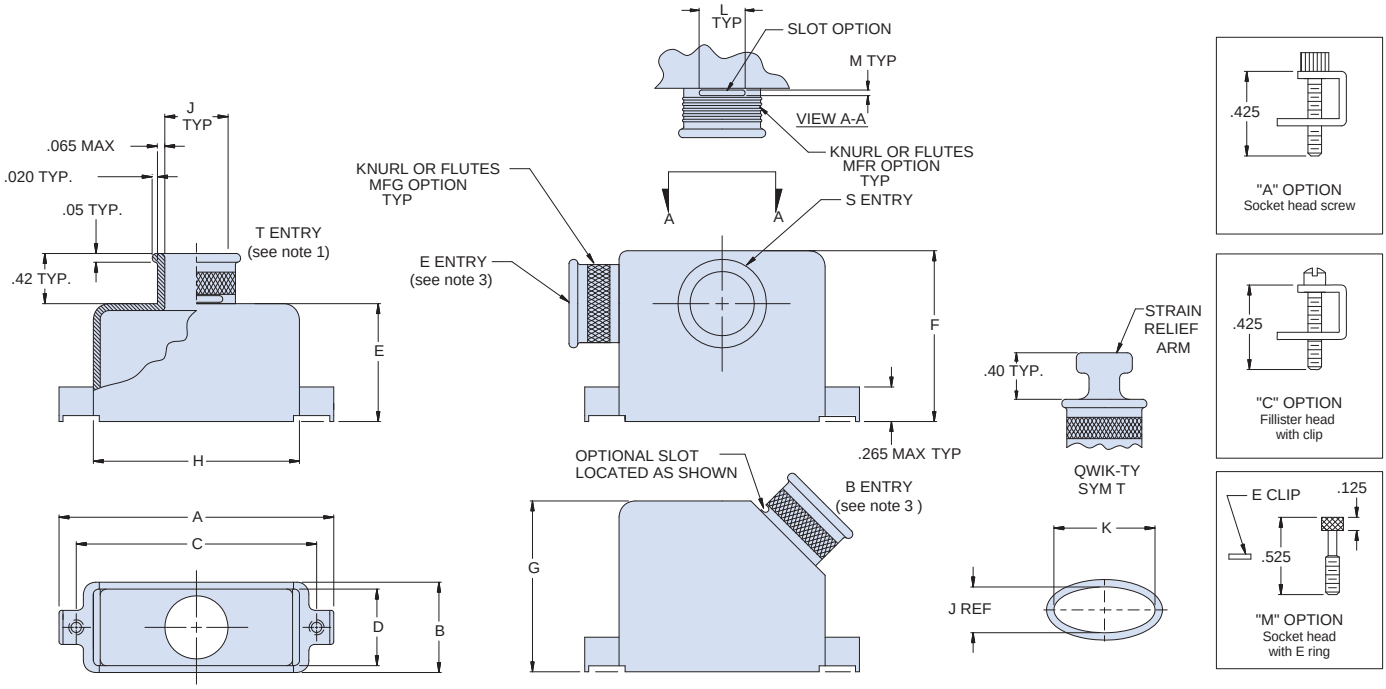
EMI/RFI Backshell with Banding Porch and Qwik-Ty Strain Relief, Multiple-Entry, Configurable

Solid shell, top, side, end, 45° , single / dual cable entry · 557-316

How To Order

Sample Part Number	557T316	M	2	31	S	T	B	H	6

Series	**557T316** = Top entry (Table II and III) **557S316** = Side entry (Table IV) **557E316** = End entry (Table IV) **557B316** = 45° entry (Table II and III) For multiple entries, select two letters to indicate choice e.g. **SE** = Side and End entries
Finish Symbol	**M** = Electroless Nickel **Z2** = Gold Plate
Shell Size	**1**, **2**, **3**, **4**, **5**, **6** (Table I)
Cable Entry	see Tables II, III, IV
Slot Option	**S** = Supplied with strain-relief slot **Omit** for no slot
Qwik-Ty Option	**T** = with Qwik-Ty strain relief arm **Omit** for none
Band Option	**B** = Band supplied (600-052) **K** = Coiled Band supplied (600-052-1) **Omit** for none
Jackscrew Option	**A**, **C**, **M** (see diagrams) **H** = Hole **Omit** for #4-40 Threaded hole
Optional Can Height	**6** = 1.5" (38.1mm) **8** = 2.0" (50.8mm) **10** = 2.5" (63.5mm) **Omit** for standard height (see note 3)



EMI/RFI Backshell with Banding Porch and Qwik-Ty Strain Relief, Multiple-Entry, Configurable

SPACE GRADE NASA ESA, JAXA SCREENED

Solid shell, top, side, end, 45°, single / dual cable entry · 557-316

Table I: Shell Size								
Shell Size	A Max	B ±.020 (.51)	C ±.005 (.13)	D Ref	E Max	F Max	G Max**	H Ref
1*	1.25 (31.75)	.520 (13.21)	.984 (24.99)	.440 (11.18)	.695 (17.65)	1.413 (35.89)	1.035 (26.29)	.856 (21.74)
2	1.58 (40.13)	.520 (13.21)	1.312 (33.32)	.440 (11.18)	.695 (17.65)	1.413 (35.89)	1.035 (26.29)	1.186 (30.12)
3	2.13 (54.10)	.520 (13.21)	1.852 (47.04)	.440 (11.18)	.945 (24.00)	1.413 (35.89)	1.035 (26.29)	1.727 (43.87)
4	2.77 (70.36)	.520 (13.21)	2.500 (63.50)	.440 (11.18)	.945 (24.00)	1.595 (40.51)	1.035 (26.29)	2.383 (60.53)
5	2.68 (68.07)	.629 (15.98)	2.406 (61.11)	.549 (13.94)	1.135 (28.83)	1.595 (40.51)	1.125 (28.58)	2.287 (58.09)
6	2.77 (70.36)	.690 (17.53)	2.500 (63.50)	.610 (15.49)	1.265 (32.13)	1.595 (40.51)	1.185 (30.10)	2.405 (61.09)

*Max entry for Shell Size 1 is Dash No. 34 for Top entries and Dash No. 33 for 45° entries. **See Note 3

Table II: Top / 45° Entry Location, Shell Size 1 – 4 Only				
Dash No.	J Dia	K Dim	L Dim	M Dim
16	.188 (4.78)	N/A	.19 (4.83)	.08 (2.03)
18	.205 (5.21)	N/A	.20 (5.08)	.08 (2.03)
23	.250 (6.35)	N/A	.22 (5.59)	.08 (2.03)
30	.312 (7.92)	N/A	.25 (6.35)	.08 (2.03)
31	.375 (9.52)	N/A	.28 (7.11)	.08 (2.03)
32	.438 (11.13)	N/A	.31 (7.87)	.08 (2.03)
33	.562 (14.27)	.723 (18.36)	.38 (9.65)	.08 (2.03)
34	.650 (16.51)	.967 (24.56)	.44 (11.18)	.08 (2.03)
35	.562 (14.27)	1.250 (31.75)	.45 (11.43)	.08 (2.03)

Table III: Top / 45° Entry Location, Shell Size 5 & 6 Only				
Dash No.	J Dia	K Dim	L Dim	M Dim
16	.188 (4.78)	N/A	.19 (4.83)	.08 (2.03)
23	.250 (6.35)	N/A	.22 (5.59)	.08 (2.03)
30	.312 (7.92)	N/A	.25 (6.35)	.08 (2.03)
31	.375 (9.52)	N/A	.28 (7.11)	.08 (2.03)
32	.438 (11.13)	N/A	.31 (7.87)	.08 (2.03)
33	.562 (14.27)	N/A	.38 (9.65)	.08 (2.03)
34	.460 (11.68)	1.380 (35.05)	.44 (11.18)	.08 (2.03)
35	.460 (11.68)	1.500 (38.10)	.45 (11.43)	.08 (2.03)

Table IV: End / Side Entry Location, Shell Size 1 – 6 Only				
Dash No.	J Dia	K Dim	L Dim	M Dim
16	.188 (4.78)	N/A	.19 (4.83)	.08 (2.03)
18	.205 (5.21)	N/A	.20 (5.08)	.08 (2.03)
23	.250 (6.35)	N/A	.22 (5.59)	.08 (2.03)
30	.312 (7.92)	N/A	.25 (6.35)	.08 (2.03)
31	.375 (9.52)	N/A	.28 (7.11)	.08 (2.03)
32	.438 (11.13)	N/A	.31 (7.87)	.08 (2.03)
33	.562 (14.27)	N/A	.38 (9.65)	.08 (2.03)
34	.650 (16.51)	N/A	.44 (11.18)	.08 (2.03)
36	.650 (16.51)	.967 (24.56)	.45 (11.43)	.08 (2.03)

NOTES

1. For die cast backshell, entry may be elliptical. Consult factory for dimensions.
2. Cable entry dash no. "00" indicates shorting can option, available on T (Top Entry) only. See Part No. 557T316 on page 43 for ordering information.
3. For "B" configuration: Dash no. 33, standard can height to be 1.400 when mounting hardware is required.
   Dash no. 34 and 35, standard can height to be 1.800
   For "E" configuration: Dash 34 and 36 standard can height will be 2.050 when mounting hardware is required.
   For "T" configuration: Shell Size 1 with Dash 34 entry only available without hardware. Consult factory for shorter lengths.

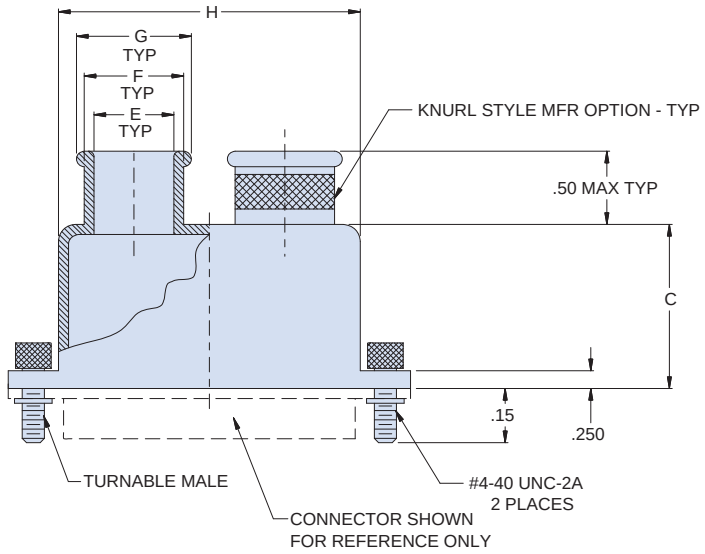
MATERIALS

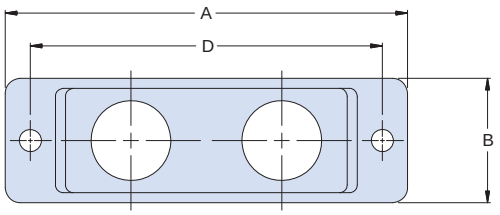
Backshell: Aluminum alloy
Hardware: 300 Series Stainless Steel

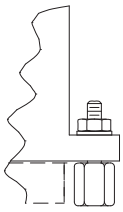
EMI/RFI Backshell with Dual Band Porch Cable Entries

Solid shell, dual top cable entry · 557-080

How To Order						
Sample Part Number	**557-080**	**M**	**2**	**P**	**B**	
Series	Dual entry backshell					
Finish Symbol	**M** = Electroless Nickel					
Shell Size	**1**, **2**, **3**, **4**, **5**, **6** (Table I)					
Jackscrew Option	**Omit** for jackscrews **P** = Female Jackposts					
Band Option	**B** = Band supplied (600-052) **K** = Coiled Band supplied (600-052-1) **Omit** for none					







Female Jackpost

Table I: Shell Size								
Shell Size	**A Max**	**B**	**C**	**D ±.005 (.13)**	**E**	**F**	**G**	**H**
1	1.25 (31.75)	.53 (13.46)	.75 (19.05)	.984 (24.99)	.125 (3.18)	.250 (6.35)	.312 (7.92)	.76 (19.30)
2	1.58 (40.13)	.53 (13.46)	.75 (19.05)	1.312 (33.32)	.250 (6.35)	.375 (9.52)	.437 (11.10)	1.09 (27.69)
3	2.13 (54.10)	.53 (13.46)	1.00 (25.40)	1.852 (47.04)	.250 (6.35)	.375 (9.52)	.437 (11.10)	1.63 (41.40)
4	2.77 (70.36)	.53 (13.46)	1.00 (25.40)	2.500 (63.50)	.250 (6.35)	.375 (9.52)	.437 (11.10)	2.28 (57.91)
5	2.68 (68.07)	.66 (16.76)	1.25 (31.75)	2.406 (61.11)	.375 (9.52)	.500 (12.70)	.562 (14.27)	2.18 (55.37)
6	2.77 (70.36)	.73 (18.54)	1.25 (31.75)	2.500 (63.50)	.500 (12.70)	.625 (15.88)	.688 (17.48)	2.28 (57.91)

MATERIALS

Backshell: Aluminum alloy
Jackscrew, Bracket, and E-Ring: CRES/Passivated

EMI/RFI Backshell with Cone and Ring Shield Termination (non-banding)

Solid shell, top or side cable entry · 557-387

SPACE GRADE NASA ESA, JAXA SCREENED

How To Order						
Sample Part Number	**557T387**	**M**	**2**	**F**	**03**	**C**
Series	**557T387** = Top entry **557S387** = Side entry **557E387** = End entry					
Finish Symbol	**M** = Electroless Nickel					
Shell Size	**1**, **2**, **3**, **4**, **5**, **6** (Table I)					
Strain Relief / Nut Option	**F** = Strain Relief Clamp **G** = Nut					
Cable Entry	**02**, **03**, **04**, **05** (Table II)					
Clip / Jackscrew Option	**C** = Supplied with Retainer Clips and Jackscrews **Omit** for none					

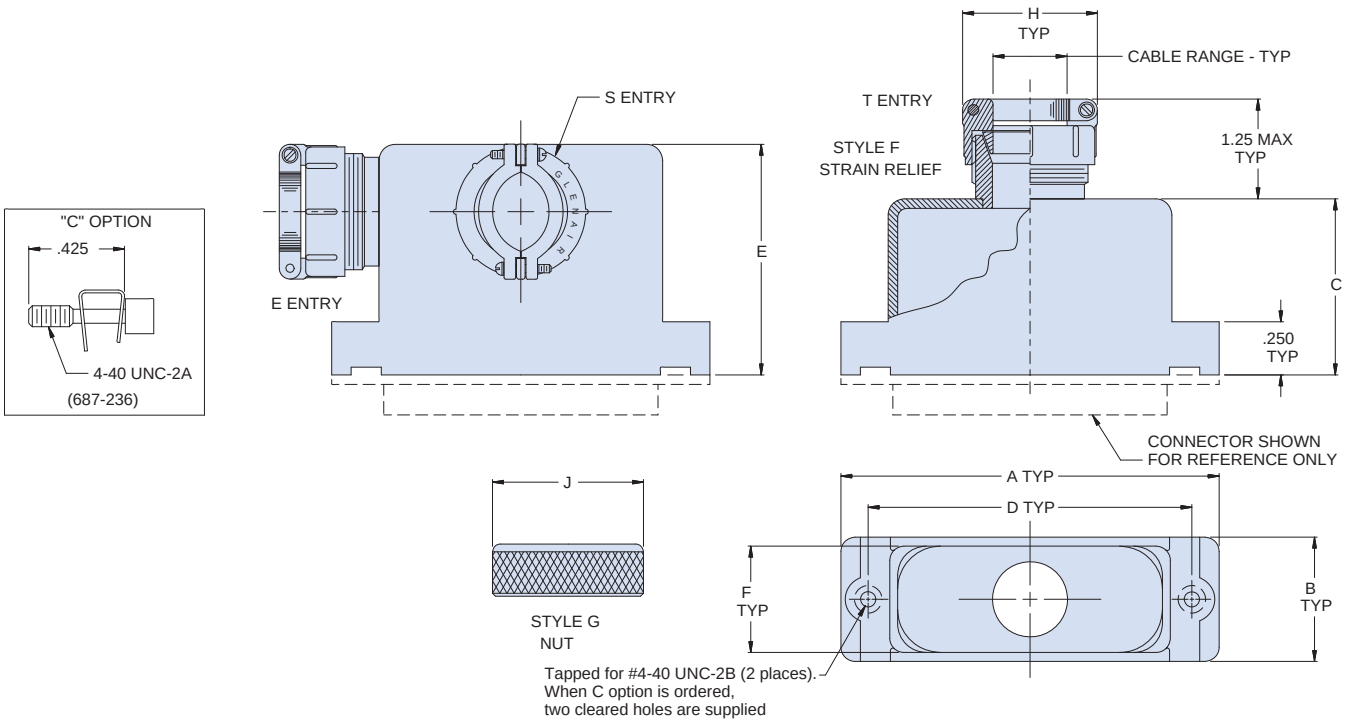


Table II: Cable Entry Dash No.

Dash No.	H Max	J Max	Cable Range	
			Min	Max
02	.968 (24.59)	.781 (19.84)	.125 (3.18)	.250 (6.35)
03	1.046 (26.57)	.906 (23.01)	.250 (6.35)	.375 (9.52)
04	1.156 (29.36)	1.031 (26.19)	.312 (7.92)	.500 (12.70)
05	1.218 (30.94)	1.156 (29.36)	.437 (11.10)	.625 (15.88)

Table I: Shell Size

Shell Size	A Max	B	C	D ±.005 (.13)	E	F	Max Dash No.
1	1.25 (31.75)	.53 (13.46)	.75 (19.05)	.984 (24.99)	1.88 (47.75)	.43 (10.92)	03
2	1.58 (40.13)	.53 (13.46)	.75 (19.05)	1.312 (33.32)	1.88 (47.75)	.43 (10.92)	03
3	2.13 (54.10)	.53 (13.46)	1.00 (25.40)	1.852 (47.04)	1.88 (47.75)	.43 (10.92)	03
4	2.77 (70.36)	.53 (13.46)	1.00 (25.40)	2.500 (63.50)	1.88 (47.75)	.43 (10.92)	03
5	2.68 (68.07)	.66 (16.76)	1.25 (31.75)	2.406 (61.11)	2.13 (54.10)	.56 (14.22)	04
6	2.77 (70.36)	.73 (18.54)	1.25 (31.75)	2.500 (63.50)	2.22 (56.39)	.63 (16.00)	05

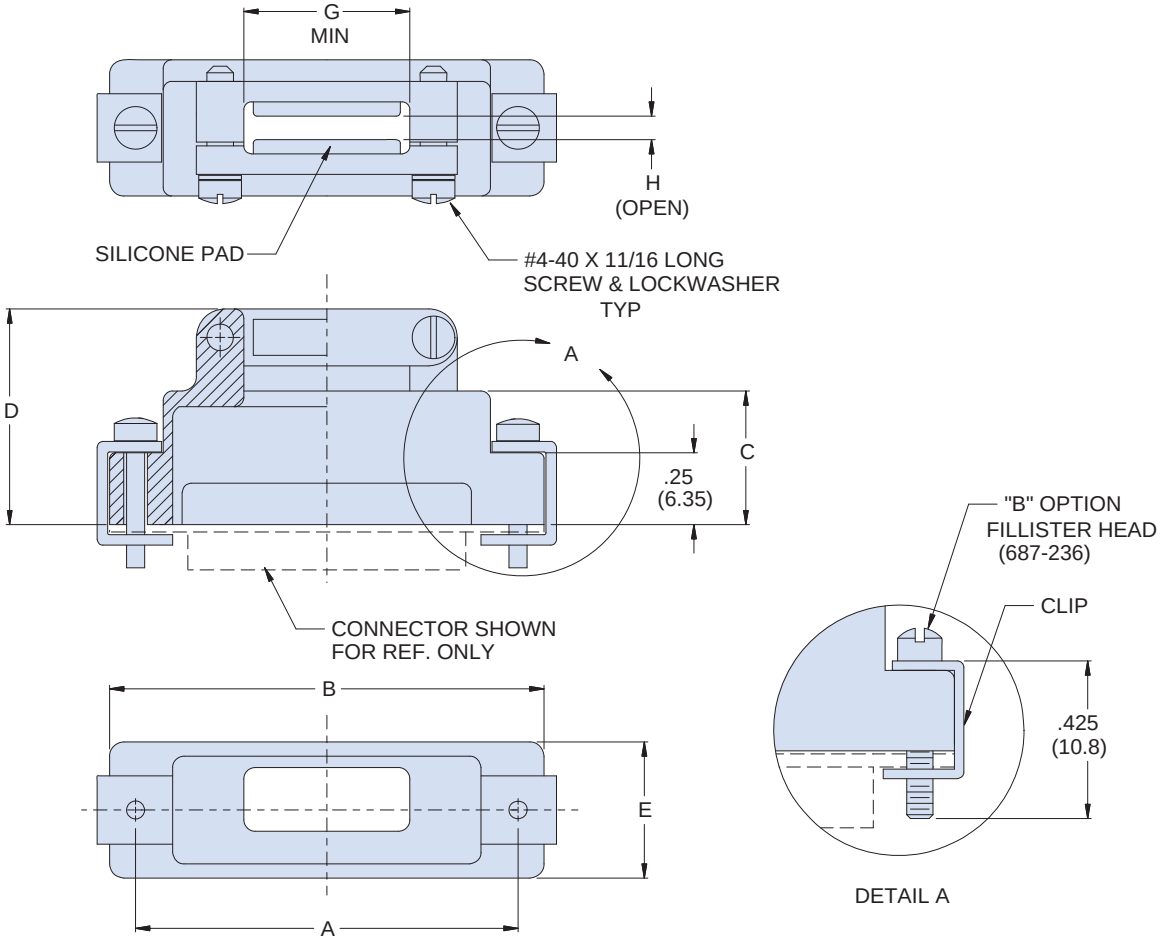
MATERIALS

Backshell, Clamp, Gland Nut, Ferrule: Aluminum alloy
Hardware: CRES/Passivated

Low-Profile Strain Relief Backshell

Solid shell, top cable entry · 557-467

How To Order					
Sample Part Number	**557T467**	**Z2**	**-3**	**H**	
Series	**557T467** = Top entry				
Finish Symbol	**M** = Electroless Nickel **Z2** = Gold Plate				
Shell Size	**1**, **2**, **3**, **4**, **5**, **6** (Table I)				
Jackscrew Type	**A**, **B**, **C**, **E**, **H**, **L**, **EL**, **ELS**, **EMS**, **HSL**, **HSM** (see diagrams) **T** = 4-40 mating hole, no jackscrews				



MATERIALS

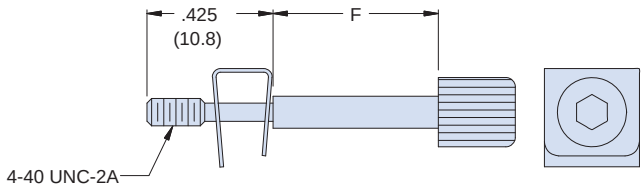
Backshell: Aluminum alloy
Hardware: CRES / passivated
Wire guide pad: Silicone

Low-Profile Strain Relief Backshell

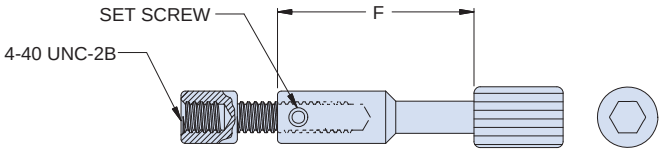
Solid shell, top cable entry · 557-467

SPACE GRADE
NASA
ESA, JAXA
SCREENED

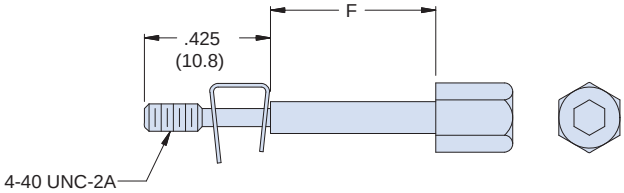
557-467 Hardware Options



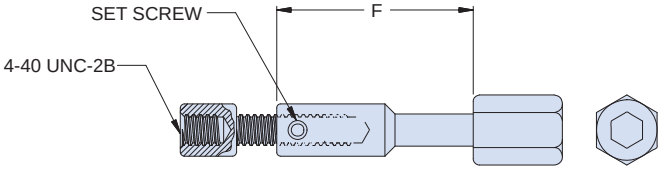
EMS option
Extended Knurled Socket Head



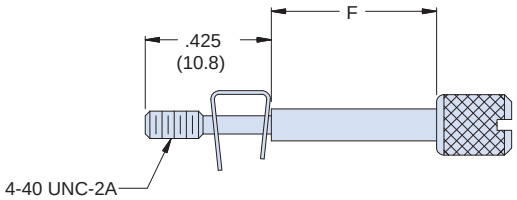
ELS option
Extended Knurled Socket Head
Turnable Female



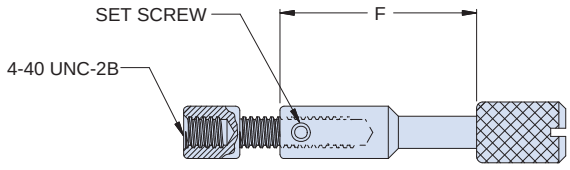
HSM option
Extended Hex Socket Head



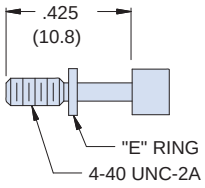
HSL option
Extended Hex Socket Head
Turnable Female



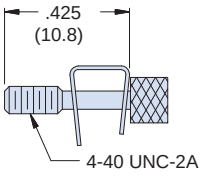
E option
Extended Knurled Slotted Head



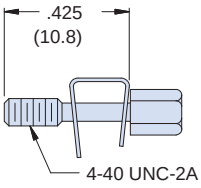
EL option
Extended Knurled Turnable Female



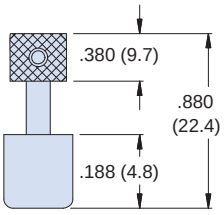
A option
Allen Head Screw



C option
Allen Head Screw



H option
Hex Head Screw



L option
Turnable Female

Table I: Shell Size

Shell Size	A	B	C	D	E	F Min	Cable Entry	
							G	H
1	.984 (24.99)	1.25 (31.75)	.75 (19.05)	1.06 (26.92)	.53 (13.46)	.50 (12.70)	.350 (8.89)	.188 (4.78)
2	1.312 (33.32)	1.58 (40.13)	.75 (19.05)	1.06 (26.92)	.53 (13.46)	.50 (12.70)	.562 (14.27)	.188 (4.78)
3	1.852 (47.04)	2.10 (53.34)	.75 (19.05)	1.06 (26.92)	.53 (13.46)	.50 (12.70)	1.000 (25.40)	.188 (4.78)
4	2.500 (63.50)	2.75 (69.85)	1.00 (25.40)	1.31 (33.27)	.53 (13.46)	.68 (17.27)	1.625 (41.28)	.188 (4.78)
5	2.406 (61.11)	2.68 (68.07)	1.00 (25.40)	1.31 (33.27)	.66 (16.76)	.68 (17.27)	1.500 (38.10)	.250 (6.35)
6	2.500 (63.50)	2.74 (69.60)	1.00 (25.40)	1.31 (33.27)	.71 (18.03)	.68 (17.27)	1.625 (41.28)	.250 (6.35)

Shorting Can with Variable Height and Lanyard Attachment Options

557-493

How To Order								
Sample Part Number	**557-493**	**M**	**2**	**C**	**1**	**-6**	**H**	**A**

Series	**557-493** Shorting Can Backshell
Finish Symbol	**M** = Electroless Nickel **Z2** = Gold Plate
Shell Size	**1**, **2**, **3**, **4**, **5**, **6** (Table I)
Jackscrew Option	**B** = Fillister head jackscrew and clip **C** = Socket head jackscrew and clip **J** = Female jackpost
Height Code	**1**, **2**, **3**, **4**, **5**, **6**, **7** (Table III)
Attachment Length	in 1/2 inch increments (e.g. **-6** = 3 inches)
Attachment Symbol	(see Table IV)
Attachment Ring Diameter	(see Table V)

Table I: Shell Size

Shell Size	A Max	B	C ±.005 (0.13)
1	1.25 (31.75)	.53 (13.46)	.984 (24.99)
2	1.58 (40.13)	.53 (13.46)	1.312 (33.32)
3	2.13 (54.10)	.53 (13.46)	1.852 (47.04)
4	2.77 (70.36)	.53 (13.46)	2.500 (63.50)
5	2.68 (68.07)	.66 (16.76)	2.406 (61.11)
6	2.77 (70.36)	.73 (18.54)	2.500 (63.50)

Table III: Height Code

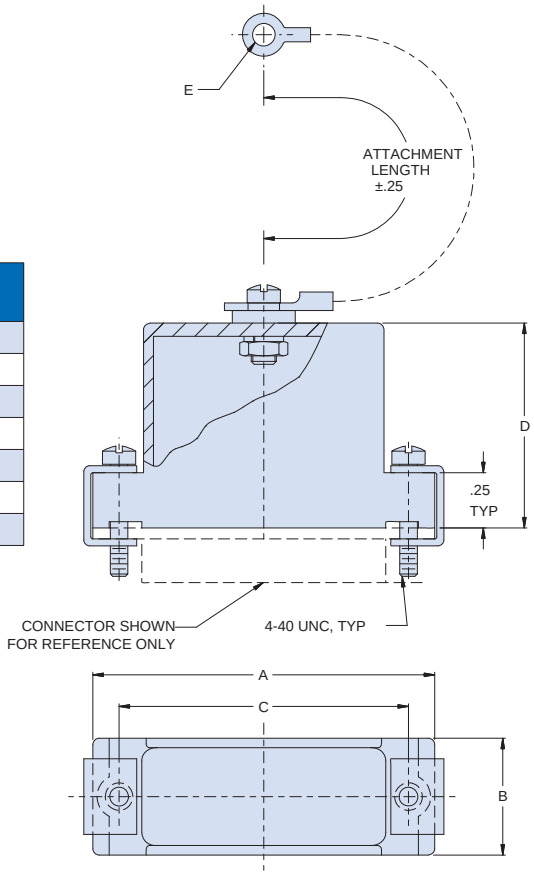
Height Code	D
1	1.00 (25.40)
2	1.25 (31.75)
3	1.50 (38.10)
4	1.75 (44.45)
5	2.00 (50.80)
6	2.50 (63.50)
7	3.00 (76.20)

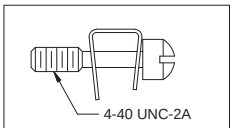
Table V: Attachment Ring Diameter

Symbol	E Dia
A	.145 (3.68)
B	.167 (4.24)
C	.182 (4.62)
D	.191 (4.85)
E	.125 (3.18)
F	.218 (5.54)

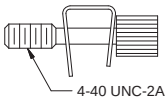
Table IV: Attachment

Symbol	Attachment Detail
D	Bead Chain, CRES/Passivate, with Terminal
F	Wire Rope, Nylon Jacket, with Terminal
G	Nylon Rope, with Terminal
H	Wire Rope, Teflon Jacket, with Terminal
N	no attachment
R	Wire Rope, PVC Jacket, with Terminal
S	#8 Sash Chain, CRES/Passivate
U	Wire Rope, Polyurethane Jacket, with Terminal

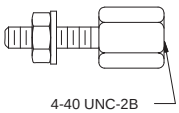




"B" Option
Fillister head jackscrew and clip



"C" Option
Socket head jackscrew and clip



"J" Option
Female jackpost

MATERIALS

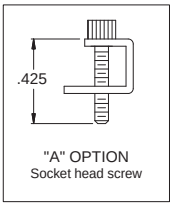
Shorting Can: Aluminum alloy
Hardware: CRES / passivated

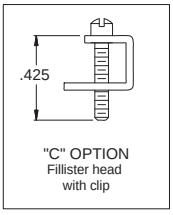
Shorting Can

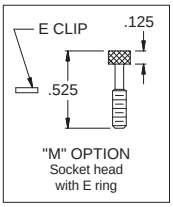
557T316

SPACE GRADE
NASA
ESA, JAXA
SCREENED

How To Order						
Sample Part Number		**557T316**	**M**	**2**	**00**	
Series	**557T316** = Top entry					
Finish Symbol	**M** = Electroless Nickel **Z2** = Gold Plate					
Shell Size	**1**, **2**, **3**, **4**, **5**, **6** (Table I)					
Shorting Can	**00**					
Jackscrew Option	**A**, **C**, **M** (see diagrams) **H** = Hole					







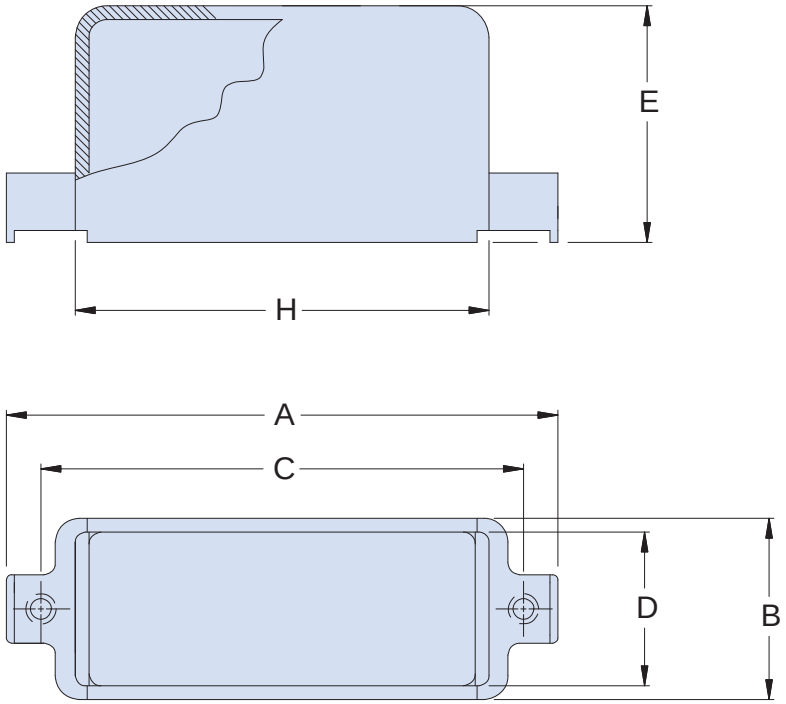


Table I: Shell Size						
Shell Size	**A Max**	**B ±.020 (.51)**	**C ±.005 (.13)**	**D Ref**	**E Max**	**H Ref**
1*	1.25 (31.75)	.520 (13.21)	.984 (24.99)	.440 (11.18)	.695 (17.65)	.856 (21.74)
2	1.58 (40.13)	.520 (13.21)	1.312 (33.32)	.440 (11.18)	.695 (17.65)	1.186 (30.12)
3	2.13 (54.10)	.520 (13.21)	1.852 (47.04)	.440 (11.18)	.945 (24.00)	1.727 (43.87)
4	2.77 (70.36)	.520 (13.21)	2.500 (63.50)	.440 (11.18)	.945 (24.00)	2.383 (60.53)
5	2.68 (68.07)	.629 (15.98)	2.406 (61.11)	.549 (13.94)	1.135 (28.83)	2.287 (58.09)
6	2.77 (70.36)	.690 (17.53)	2.500 (63.50)	.610 (15.49)	1.265 (32.13)	2.405 (61.09)

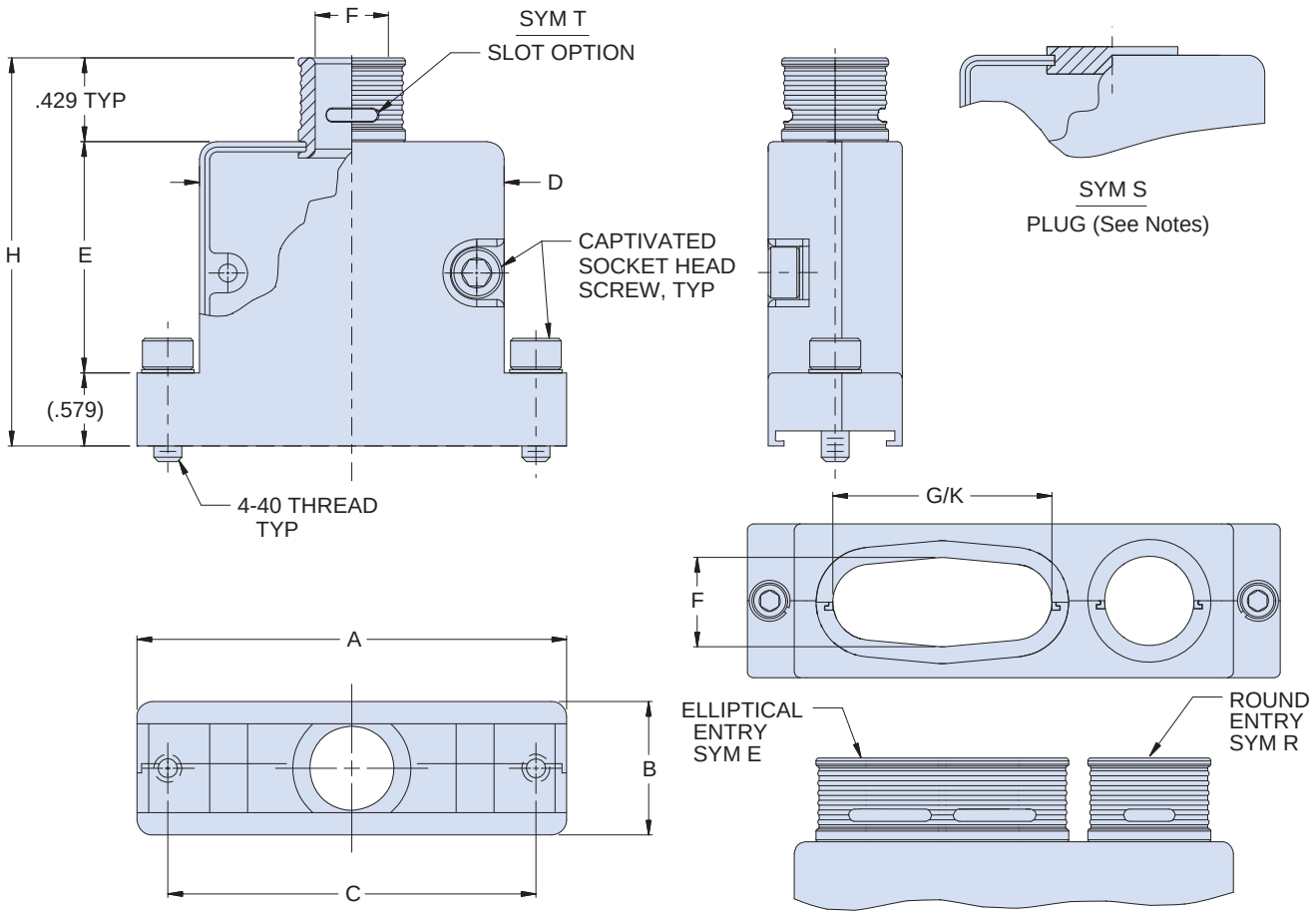
MATERIALS

Backshell: Aluminum alloy
Hardware: CRES / passivated

EMI/RFI Split Backshell, Aluminum or Composite with Split Removable Banding Porches

Split shell, round or elliptical, 1, 2, or 3 top cable entries · 557-609

How To Order									
Sample Part Number	**557T609**	**M**	**4**	**R1**	**E1**	**S**	**T**	**K**
Series	**557T609** = Top entry split backshell							
Material/ Finish	**M** = Aluminum / Electroless Nickel **XM** = Composite Thermoplastic / Electroless Nickel							
Shell Size	**1**, **2**, **3**, **4**, **5**, **6** (Table I)							
No. of Round Entries	See Table I, **Omit** for none							
No. of Elliptical Entries	See Table I, **Omit** for none							
Plug(s)	Supplied in the same number and style as entries. **Omit** for none							
Slot(s)	**T** = with slots **Omit** for none							
Band Option	**B** = Band(s) supplied (600-052) **K** = Coiled Band(s) supplied (600-052-1) **Omit** for none							



EMI/RFI Split Backshell, Aluminum or Composite with Split Removable Banding Porches

SPACE GRADE NASA ESA, JAXA SCREENED

Split shell, round or elliptical, 1, 2, or 3 top cable entries · 557-609

Table I: Shell Size								
Shell Size	A	B	C ±.005 (.13)	D	E Max	F Max	G*	H Max
1	1.213 (30.81)	.630 (16.00)	.984 (24.99)	.728 (18.49)	1.300 (33.02)	.315 (8.00)	N/A	2.308 (58.62)
2	1.535 (38.99)	.630 (16.00)	1.312 (33.32)	1.059 (26.90)	1.300 (33.02)	.315 (8.00)	N/A	2.308 (58.62)
3	2.087 (53.01)	.630 (16.00)	1.852 (47.04)	1.598 (40.59)	1.520 (38.61)	.315 (8.00)	.575 (14.60)	2.528 (64.21)
4	2.728 (69.29)	.630 (16.00)	2.500 (63.50)	2.248 (57.10)	1.520 (38.61)	.315 (8.00)	1.225 (31.12)	2.528 (64.21)
5	2.638 (67.01)	.750 (19.05)	2.406 (61.11)	2.192 (55.68)	1.520 (38.61)	.433 (11.00)	1.051 (26.70)	2.528 (64.21)
6	2.728 (69.29)	.787 (19.99)	2.500 (63.50)	2.248 (57.10)	1.520 (38.61)	.470 (11.94)	1.070 (27.18)	2.528 (64.21)
*Dimension G is the maximum elliptical width when used with one round entry. Not applicable with Shell size 1 and 2								

Table I: Shell Size (continued)		
Shell Size	Max Number of Round Entries	K Max Width of a Single Elliptical Entry
1	1	N/A
2	1	.661 (16.79)
3	2	1.200 (30.48)
4	3	1.850 (46.99)
5	3	1.794 (45.57)
6	3	1.850 (46.99)

NOTES

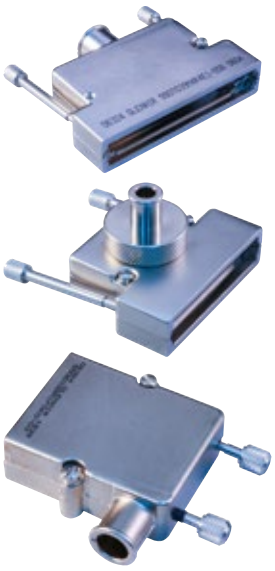
1. When ordering round and/or elliptical entries, enter the style and number. (eg. for 1 round entry, use R1, for 2 round entries, use R2.) For elliptical entries, use E1 or E2.
2. If ordered, plugs will be provided in the same number and style as there are entries.

MATERIALS

Backshell, Entries, Plugs: Aluminum or Composite Thermoplastic / Electroless Nickel finish
Hardware: CRES / passivated

EMI/RFI Split Backshell with Banding Porch for Panel and Cable Mounted Connectors

Split shell, top, side, and end cable entry · 550-039



How To Order								
Sample Part Number	**550T039**	**M**	**2**	**F0**	**B**	**1**	**-02**	**B**
Series	**550T039** = Top entry **550S039** = Side entry **550E039** = End entry							
Finish Symbol	**M** = Electroless Nickel **Z2** = Gold Plate							
Shell Size	**1**, **2**, **3**, **4**, **5**, **6** (Table I)							
Receptacle Mounting	**F0** = Front mount **R1–R9** = Rear mount **CC** = Cable-to-cable (see Table III)							
Jackscrew Type	**A**, **B**, **D**, **E**, **H**, **K**, **J**, **F**, **L**, **M**, **N**, **P**, **R** (see diagrams)							
EMI Gasket	**1** = With EMI gasket **0** = Without EMI gasket							
Cable Entry	**01**, **02**, **03**, **04**, **05**, **06**, **07**, **08**, **09**, **10**, **11**, **12**, **13**, **14** (Table II)							
Band Option	**B** = Band Supplied (600-052) **Omit** for none							

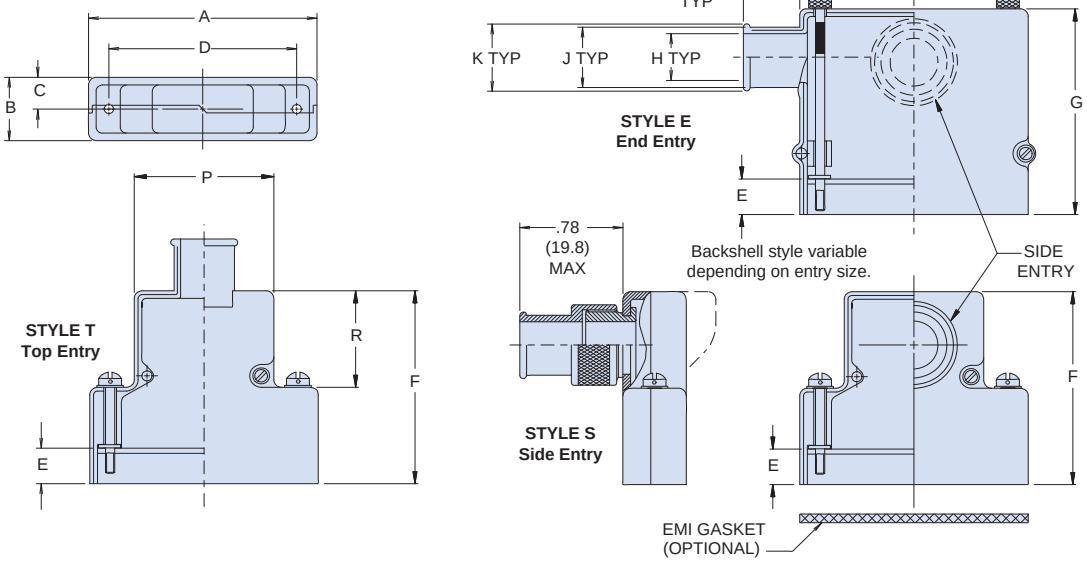


Table I: Common Connector/Shell Interface and Backshell Dimensions

Shell Size	Com'l Shell Size Ref.	A Max.		B Max.		C		D ±.005 (.13)		P		R Ref.		Max Entry (Styles **T** and **E**)
		In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	
1	E/09	1.393	35.4	.624	15.8	.312	7.9	.984	25.0	.730	18.5	.719	18.3	05
2	A/15	1.706	43.3	.624	15.8	.312	7.9	1.312	33.3	1.050	26.7	.719	18.3	05
3	B/25	2.265	57.5	.624	15.8	.312	7.9	1.852	47.0	1.594	40.5	.938	23.8	05
4	C/37	2.900	73.7	.624	15.8	.312	7.9	2.500	63.5	2.240	56.9	.938	23.8	08*
5	D/50	2.800	71.1	.750	19.1	.375	9.5	2.406	61.1	2.140	54.4	.938	23.8	08
6	F/104	2.900	73.7	.844	21.4	.422	10.7	2.500	63.5	2.240	56.9	1.094	27.8	14

*Max entry 08 for style "E" backshell

MATERIALS

Backshell: Aluminum alloy
Jackscrews: CRES / passivated
Gasket: Metex

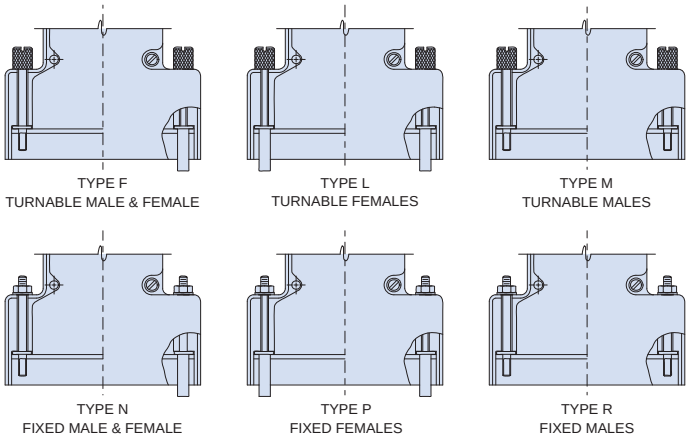
EMI/RFI Split Backshell with Banding Porch for Panel and Cable Mounted Connectors

Split shell, top, side, and end cable entry · 550-039

SPACE GRADE
NASA
ESA, JAXA
SCREENED

Table II: Cable Entry						
Entry Size	H Dia		J Dia		K Dia	
	In.	mm	In.	mm	In.	mm
01	.125	3.18	.250	6.35	.312	7.92
02	.250	6.35	.375	9.52	.438	11.13
03	.312	7.92	.438	11.13	.500	12.70
04	.395	10.03	.500	12.70	.562	14.27
05	.438	11.13	.562	14.27	.625	15.88
06	.500	12.70	.625	15.88	.688	17.48
07	.562	14.27	.688	17.48	.750	19.05
08	.624	15.85	.750	19.05	.812	20.62
09	.688	17.48	.812	20.62	.875	22.23
10	.780	19.81	.875	22.23	.937	23.80
11	.812	20.62	.937	23.80	1.000	25.40
12	.875	22.23	1.000	25.40	1.125	28.58
13	.937	23.80	1.062	26.97	1.187	30.15
14	1.000	25.40	1.125	28.58	1.250	31.75

POLARIZING JACKSCREW OPTIONS



MALE JACKSCREW OPTIONS

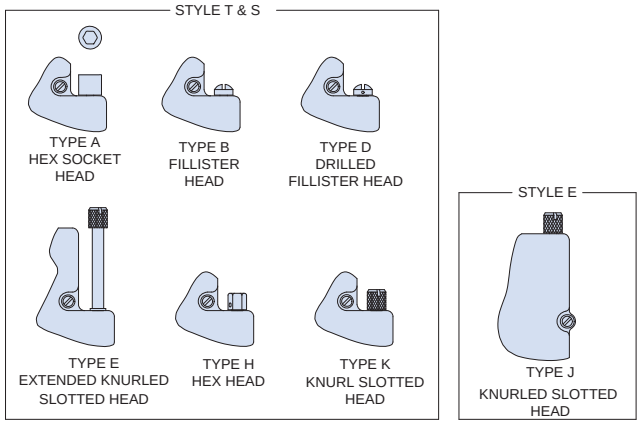
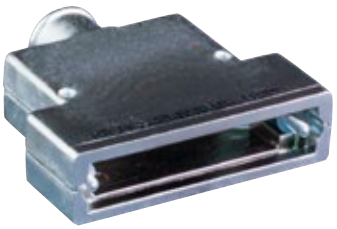


Table III: Cable Mounting and Backshell Dimensions														
Dash No.	Panel Thickness		E		F						G			
					Size 1 and 2		Size 3–5		Size 6		Size 1 and 2		Size 3–6	
	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm
CC	N/A		.185	4.7	1.467	37.3	1.686	42.8	1.842	46.8	1.592	40.4	1.842	46.8
F0	N/A		.343	8.7	1.625	41.3	1.844	46.8	2.000	50.8	1.750	44.5	2.000	50.8
R1	.031	0.79	.247	6.3	1.529	38.8	1.748	44.4	1.904	48.4	1.654	42.0	1.904	48.4
R2	.047	1.19	.231	5.9	1.513	38.4	1.732	44.0	1.888	48.0	1.638	41.6	1.888	48.0
R3	.062	1.57	.216	5.5	1.498	38.0	1.717	43.6	1.873	47.6	1.623	41.2	1.873	47.6
R4	.093	2.36	.185	4.7	1.467	37.3	1.686	42.8	1.842	46.8	1.592	40.4	1.842	46.8
R5	.104	2.64	.174	4.4	1.456	37.0	1.675	42.5	1.831	46.5	1.581	40.2	1.831	46.5
R6	.125	3.18	.153	3.9	1.435	36.4	1.654	42.0	1.810	46.0	1.560	39.6	1.810	46.0
R7	.156	3.96	.125	3.2	1.407	35.7	1.626	41.3	1.782	45.3	1.532	38.9	1.782	45.3
R8	.135	3.43	.140	3.6	1.422	36.1	1.641	41.7	1.797	45.7	1.547	39.3	1.797	45.7
R9	.188	4.78	.094	2.4	1.376	34.9	1.595	40.5	1.751	44.5	1.501	38.1	1.751	44.5

Note: accurate panel thickness specification for panel-mounted connectors ensures backshell shroud will completely envelop connector for electromagnetic compatibility. Glenair recommends optional EMI/RFI gaskets for all panel-mount EMC applications.

Composite EMI/RFI Split Backshell with Banding Porch for Panel and Cable Mount Connectors

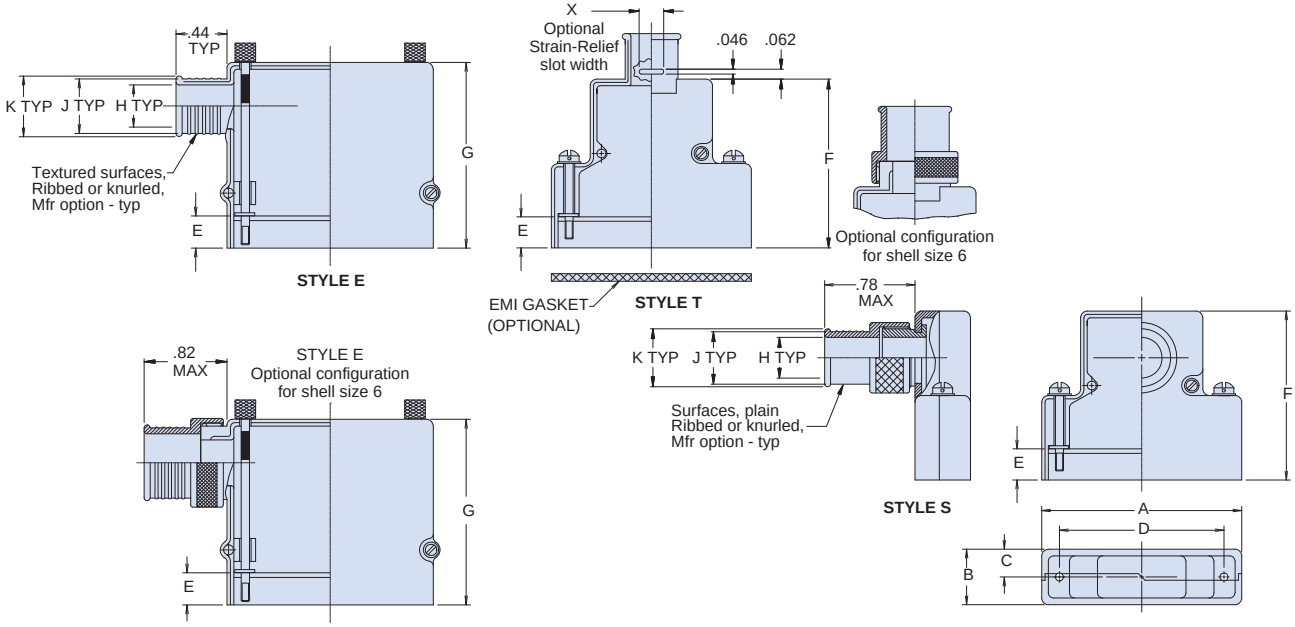
Split shell top, side, and end cable entry · 557-186

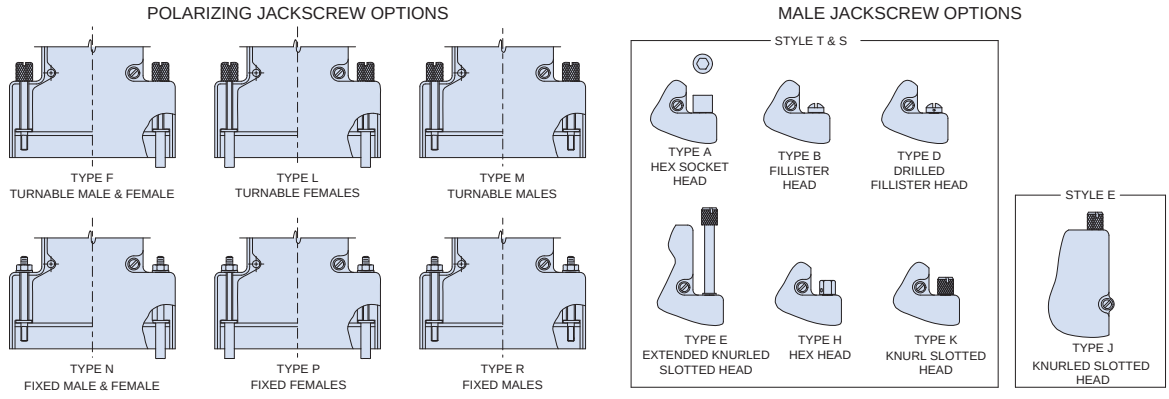


How To Order

Sample Part Number	557T186	XM	2	F0	B	1	-02	S	B

Series	**557T186** = Top entry **557S186** = Side entry **557E186** = End entry
Finish Symbol	**XM** = Electroless Nickel **Z2** = Gold Plate
Shell Size	**1**, **2**, **3**, **4**, **5**, **6** (Table I)
Receptacle Mounting	**F0** = Front mount (Table II) **R1–R7** = Rear mount (Table III) **CC** = Cable-to-cable (Table IV)
Jackscrew Type	**A, B, D, E, H, K, J, F, L, M, N, P, R** (see diagrams)
EMI Gasket	**1** = With EMI gasket **0** = Without EMI gasket
Cable Entry	**01**, **02**, **03**, **04**, **05**, **06**, **07**, **08**, **09**, **10**, **11** (Table I)
Slot Option	**S** = Supplied with strain-relief slot **Omit** for no slot
Band Option	**B** = Band supplied (600-052) **K** = Coiled Band supplied (600-052-1) **Omit** for none





Composite EMI/RFI Split Backshell with Banding Porch for Panel and Cable Mount Connectors

Split shell top, side, and end cable entry · 557-186

SPACE GRADE
NASA
ESA, JAXA
SCREENED

MATERIALS

Adapter, backshell: high-grade engineering thermoplastic
Hardware: CRES / passivated
Gasket: Metex Washer: Nylon

TABLE I: Dash Number and Entry and Slot Dimensions

Dash No.	H Dia	J Dia	K Dia	X
01	.125 (3.18)	.250 (6.35)	.312 (7.92)	N/A
02	.250 (6.35)	.375 (9.53)	.438 (11.13)	.062 (1.57)
03	.312 (7.92)	.438 (11.13)	.500 (12.70)	.094 (2.39)
04	.375 (9.53)	.500 (12.70)	.562 (14.27)	.156 (3.96)
05	.438 (11.13)	.562 (14.27)	.625 (15.88)	.188 (4.78)
06	.500 (12.70)	.625 (15.88)	.688 (17.48)	.219 (5.56)
07	.562 (14.27)	.688 (17.48)	.750 (19.05)	.250 (6.35)
08	.625 (15.88)	.750 (19.05)	.812 (20.62)	.250 (6.35)
09	.750 (19.05)	.875 (22.23)	.937 (23.80)	.312 (7.92)
10	.875 (22.23)	1.000 (25.40)	1.062 (26.79)	.375 (9.53)
11	1.000 (25.40)	1.125 (28.58)	1.188 (30.18)	.375 (9.53)

TABLE II: FRONT MOUNTING – Shell Size and Dimensions

Shell Size	A	B Max	C	D ±.005 (0.13)	E	F	G	Max Entry**
1	1.378 (35.00)	.624 (15.85)	.312 (7.92)	.984 (24.99)	.340 (8.64)	1.625 (41.28)	1.750 (44.45)	04/05
2	1.691 (42.95)	.624 (15.85)	.312 (7.92)	1.312 (33.32)	.340 (8.64)	1.625 (41.28)	1.750 (44.45)	05
3	2.250 (57.15)	.624 (15.85)	.312 (7.92)	1.852 (46,36)	.343 (8.71)	1.844 (46.84)	2.000 (50.80)	05
4	2.879 (73.13)	.624 (15.85)	.312 (7.92)	2.500 (63.50)	.343 (8.71)	1.844 (46.84)	2.000 (50.80)	05
5	2.785 (70.74)	.750 (19.05)	.375 (9.53)	2.406 (61.11)	.343 (8.71)	1.844 (46.84)	2.000 (50.80)	07
6*	2.885 (73.28)	.844 (21.44)	.422 (10.72)	2.500 (63.50)	.343 (8.71)	2.000 (50.80)	2.000 (50.80)	11

* Shell Size 6 available in Top and End Entry only. ** Max Entry applicable to Style T and E, Shell Size 01 Entry S Max -04 • Styles E & T Max. -05.

Note: accurate panel thickness specification for panel-mounted connectors ensures backshell shroud will completely envelop connector for EMC compatibility. Glenair recommends optional EMI/RFI gaskets for all panel-mount EMC applications.

TABLE III: REAR MOUNTING – Shell Size, Panel Thickness and Dimensions

Dash No.	Panel Thickness	E	F			G	
			Size 1 & 2	Size 3 – 5	Size 6	Size 1 & 2	Size 3 – 6
R1	.031 (0.79)	.247 (6.27)	1.525 (38.74)	1.745 (44.32)	1.904 (48.36)	1.656 (42.06)	1.904 (48.36)
R2	.047 (1.19)	.231 (5.87)	1.509 (38.33)	1.728 (43.89)	1.888 (47.96)	1.640 (41.66)	1.888 (47.96)
R3	.062 (1.57)	.216 (5.49)	1.500 (38.10)	1.720 (43.69)	1.873 (47.57)	1.625 (41.28)	1.873 (47.57)
R4	.093 (2.36)	.185 (4.70)	1.470 (37.34)	1.690 (42.93)	1.842 (46.79)	1.594 (40.49)	1.842 (46.79)
R5	.104 (2.64)	.174 (4.42)	1.451 (36.86)	1.671 (42.44)	1.831 (46.51)	1.585 (40.26)	1.833 (46.56)
R6	.125 (3.18)	.153 (3.89)	1.430 (36.32)	1.650 (41.91)	1.811 (46.00)	1.563 (39.70)	1.811 (46.00)
R7	.156 (3.96)	.125 (3.18)	1.400 (35.56)	1.620 (41.15)	1.781 (45.24)	1.532 (38.91)	1.780 (45.21)

TABLE IV: CABLE TO CABLE – Shell Size and Dimensions

Shell Size	A	B Max	C	D +.005 (0.13) −.000	E +.030 (0.76) −.000	F +.030 (0.76) −.000	G +.030 (0.76) −.000	Max Entry**
1	1.378 (35.00)	.624 (15.85)	.322 (8.18)	.984 (24.99)	.170 (4.32)	1.455 (36.96)	1.577 (40.06)	05
2	1.691 (42.95)	.624 (15.85)	.322 (8.18)	1.312 (33.32)	.170 (4.32)	1.455 (36.96)	1.577 (40.06)	05
3	2.250 (57.15)	.624 (15.85)	.322 (8.18)	1.852 (46.36)	.172 (4.37)	1.673 (42.49)	1.829 (46.46)	05
4	2.879 (73.13)	.624 (15.85)	.322 (8.18)	2.500 (63.50)	.172 (4.37)	1.673 (42.49)	1.829 (46.46)	05
5	2.785 (70.74)	.735 (18.67)	.375 (9.53)	2.406 (61.11)	.172 (4.37)	1.673 (42.49)	1.829 (46.46)	07
6*	2.885 (73.28)	.844 (21.44)	.422 (10.72)	2.500 (63.50)	.172 (4.37)	1.829 (46.46)	1.829 (46.46)	11

* Shell Size 6 available in Top and End Entry only. ** Max Entry applicable to Style T and E, Shell Size 01 Entry S Max -04 • Styles E & T Max. -05.

Split-Shell Low-Profile EMI Backshell, Elliptical Entry, Non-environmental

289T005 top entry, 289S005 side entry

289T005
289S005

FOR USE WITH GLENAIR SERIES 28 HIPER-D CONNECTORS

Lightweight, low profile space-saving two piece backshell fits securely into groove in HiPer-D® connectors. Fits standard HiPer-D® pin and socket connectors (280-018P, 280-019S) and Combo HiPer-D® connectors (280-046P and 280-047S). Terminate cable shield with optional Band-Master™ATS clamping band. Elliptical cable entry provides room for large wire bundles. Machined aluminum alloy or stainless steel backshell consists of two interlocking housings and two 300 series stainless steel screws. Overlapping seam improves EMI shielding performance. Compatible with Glenair Series 77 lipped heat-shrink boots. Non-environmental.

Entry Style

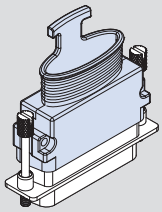


Fig. 1
Top Entry 289T005

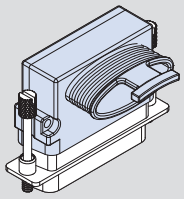


Fig. 2
Side Entry 289S005

Qwik-Ty™ Option

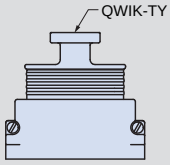


Fig. 3
Qwik-Ty™

Slot Option

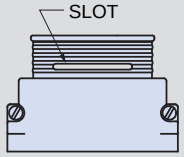


Fig. 4
Slots

Cable Entry Direction

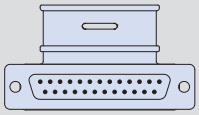


Fig. 5
Long Side Entry (1)

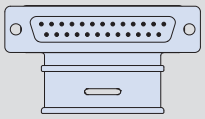


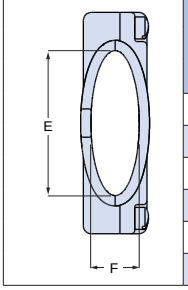
Fig. 6
Short Side Entry (2)

Ordering Information

Sample Part Number	289T005	ME	3	B	- N	N	K	

Basic Part Number	**289T005** = Top Entry (*Fig. 1*) **289S005** = Side Entry (*Fig. 2*)
Finish	**ME** = Electroless Nickel (RoHS) **Z2** = Gold (RoHS)
Shell Size	**1** = Shell Size 1 **2** = Shell Size 2 **3** = Shell Size 3 **4** = Shell Size 4 **5** = Shell Size 5 **6** = Shell Size 6
Entry Size	**A, B, C or D** See Cable Entry Size Table Below
Qwik-Ty™ Option	**N** = Supplied without Qwik-Ty™ **T** = With Qwik-Ty™ Strain Relief (*Fig. 3*)
Slot Option	**N** = Supplied without Slots **S** = With Slots for Terminating Individual Shields (*Fig. 4*)
EMI/RFI Band	**N** = Supplied without Band **K** = Supplied with Pre-Coiled Band (600-052-1)
Cable Entry Direction	***Omit for 289T005. Applies only to 289S005.*** **1** = Cable Entry on Long Side of Shell Keystone (*Fig. 5*) **2** = Cable Entry on Short Side of Shell Keystone (*Fig. 6*)

Cable Entry Size

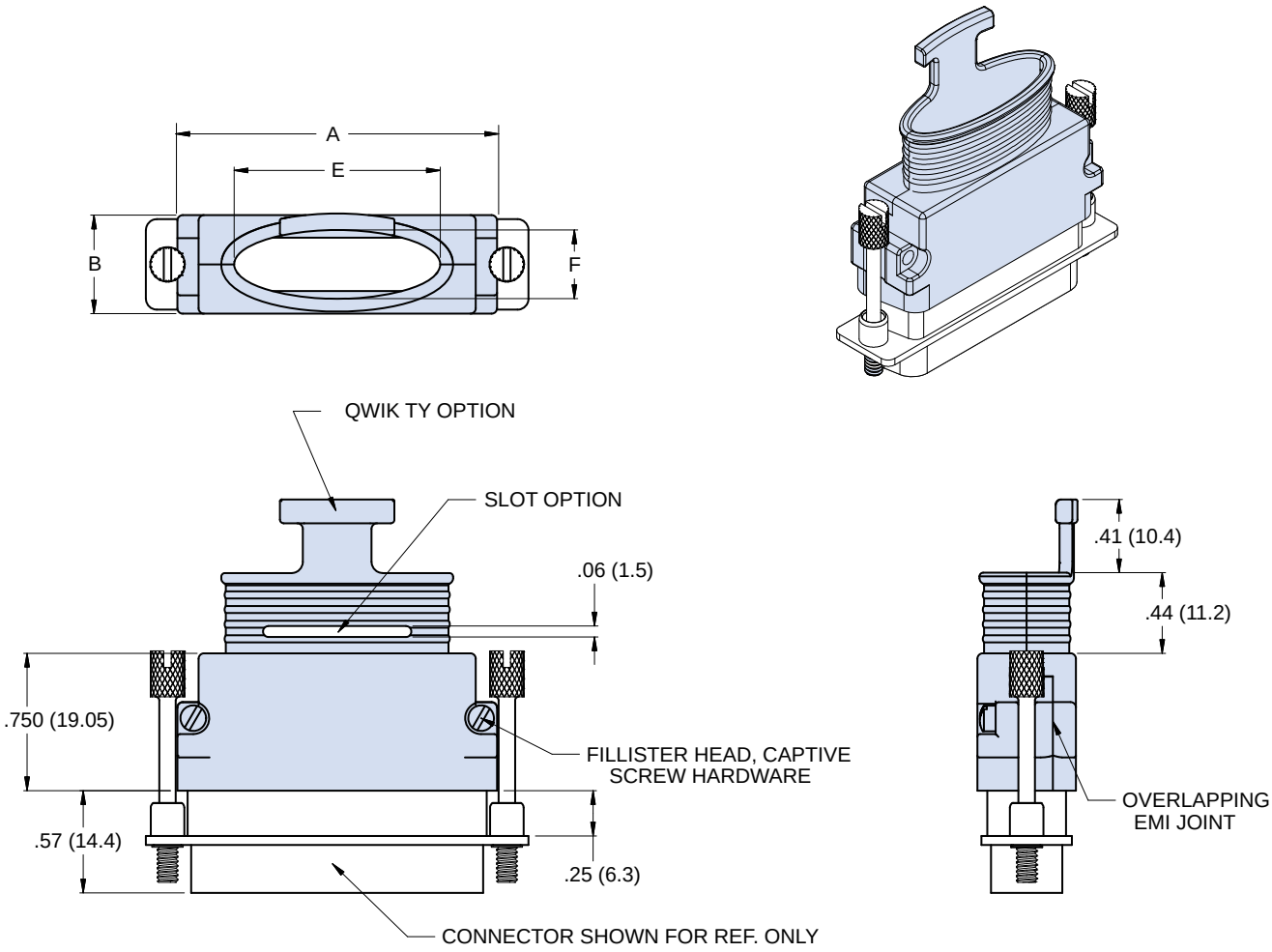


Shell Size	SIZE A				SIZE B				SIZE C				SIZE D			
	E		F		E		F		E		F		E		F	
	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm
1	.143	3.63	.143	3.63	.195	4.95	.195	4.95	.242	6.15	.242	6.15	.438	11.13	.375	9.53
2	.188	4.78	.188	4.78	.256	6.50	.256	6.50	.480	12.19	.375	9.53	.688	17.48	.375	9.53
3	.245	6.22	.245	6.22	.550	13.97	.375	9.53	.780	19.81	.375	9.53	1.125	28.58	.375	9.53
4	.291	7.39	.291	7.39	.800	20.32	.375	9.53	1.260	32.00	.375	9.53	1.813	46.05	.375	9.53
5	.326	8.28	.326	8.28	.770	19.56	.485	12.32	1.250	31.75	.485	12.32	1.750	44.45	.485	12.32
6	.376	9.55	.376	9.55	.863	21.92	.550	13.97	1.323	33.60	.550	13.97	1.875	47.63	.550	13.97

Split-Shell Low-Profile EMI Backshell, Elliptical Entry, Non-environmental

289T005 dimensions

289T005 DIMENSIONS

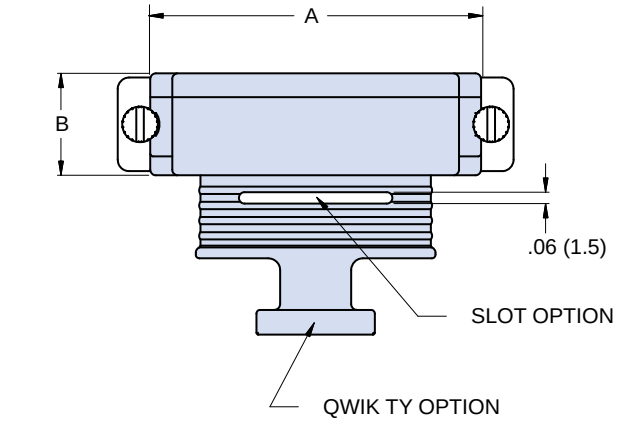


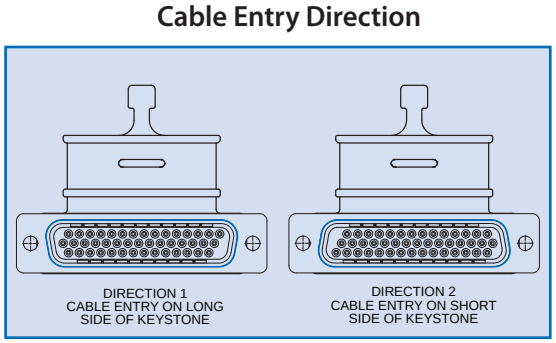
Dimensions																				
Shell Size					Entry Size A				Entry Size B				Entry Size C				Entry Size D			
	A Max		B Max		E		F		E		F		E		F		E		F	
	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm
1	.894	22.71	.550	13.97	.143	3.63	.143	3.63	.195	4.95	.195	4.95	.242	6.15	.242	6.15	.438	11.13	.375	9.53
2	1.218	30.94	.550	13.97	.188	4.78	.188	4.78	.256	6.50	.256	6.50	.480	12.19	.375	9.53	.688	17.48	.375	9.53
3	1.760	44.70	.550	13.97	.245	6.22	.245	6.22	.550	13.97	.375	9.53	.780	19.81	.375	9.53	1.125	28.58	.375	9.53
4	2.408	61.16	.550	13.97	.291	7.39	.291	7.39	.800	20.32	.375	9.53	1.260	32.00	.375	9.53	1.813	46.05	.375	9.53
5	2.297	58.34	.654	16.61	.326	8.28	.326	8.28	.770	19.56	.485	12.32	1.250	31.75	.485	12.32	1.750	44.45	.485	12.32
6	2.422	61.52	.716	18.19	.376	9.55	.376	9.55	.863	21.92	.550	13.97	1.323	33.60	.550	13.97	1.875	47.63	.550	13.97

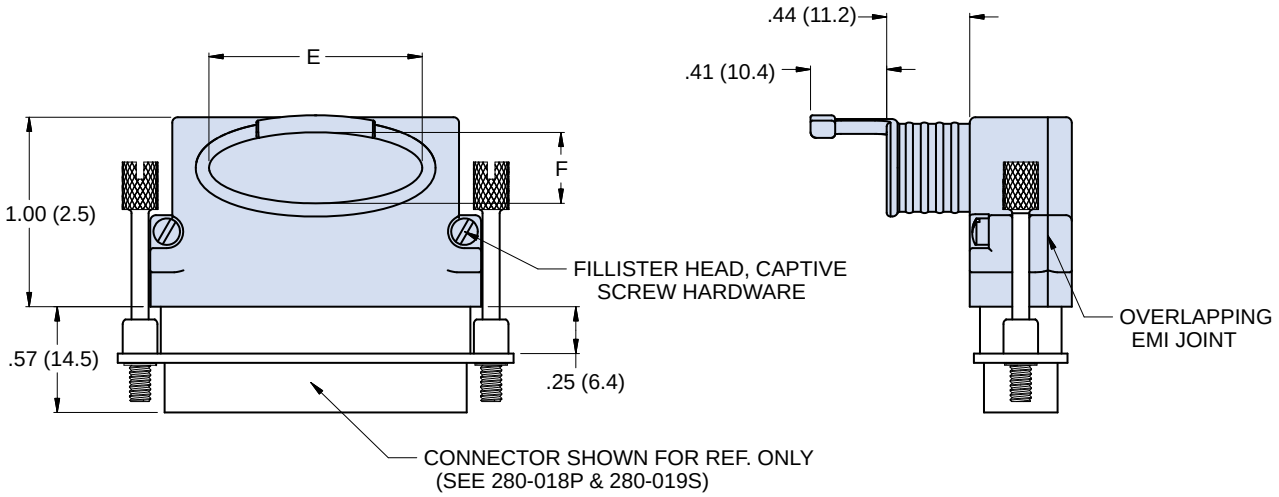
Split-Shell Low-Profile EMI Backshell, Elliptical Entry, Non-environmental

289S005 dimensions

289S005 DIMENSIONS







Shell Size	Dimensions																			
					Entry Size A				Entry Size B				Entry Size C				Entry Size D			
	A Max		B Max		E		F		E		F		E		F		E		F	
	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm
1	.894	22.71	.550	13.97	.143	3.63	.143	3.63	.195	4.95	.195	4.95	.242	6.15	.242	6.15	.438	11.13	.375	9.53
2	1.218	30.94	.550	13.97	.188	4.78	.188	4.78	.256	6.50	.256	6.50	.480	12.19	.375	9.53	.688	17.48	.375	9.53
3	1.760	44.70	.550	13.97	.245	6.22	.245	6.22	.550	13.97	.375	9.53	.780	19.81	.375	9.53	1.125	28.58	.375	9.53
4	2.408	61.16	.550	13.97	.291	7.39	.291	7.39	.800	20.32	.375	9.53	1.260	32.00	.375	9.53	1.813	46.05	.375	9.53
5	2.297	58.34	.654	16.61	.326	8.28	.326	8.28	.770	19.56	.485	12.32	1.250	31.75	.485	12.32	1.750	44.45	.485	12.32
6	2.422	61.52	.716	18.19	.376	9.55	.376	9.55	.863	21.92	.550	13.97	1.323	33.60	.550	13.97	1.875	47.63	.550	13.97

Solid Shell Low-Profile EMI Backshell, Elliptical Entry, Environmental

289T008 top entry, 289S008 side entry

SPACE GRADE
NASA
ESA, JAXA
SCREENED

289T008
289S008

FOR USE WITH GLENAIR SERIES 28 HIPER-D CONNECTORS

289-008 backshell provides watertight EMI protection for HiPer-D® connectors. Fits standard HiPer-D® pin and socket connectors (280-018P, 280-019S) and Combo HiPer-D® connectors (280-046P and 280-047S). Available with top entry or side entry. Terminate cable shield with optional Band-Master™ATS clamping band. Elliptical cable entry provides room for large wire bundles. Backshell consists of solid one piece housing, two stainless steel hex head jackscrews, two jackscrew retainer clips and silicone rubber sealing gasket. Aluminum or stainless steel. Use with Glenair Series 77 heat-shrink boot.

Entry Style

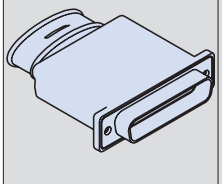


Fig. 1 **Top Entry** 289T008

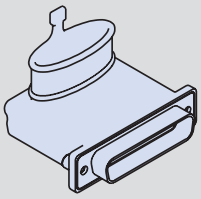


Fig. 2 **Side Entry** 289S008

Qwik-Ty™ Option

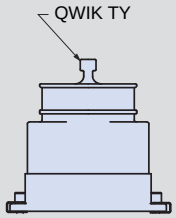


Fig. 3 **Qwik-Ty™**

Slot Option

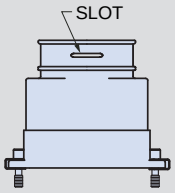


Fig. 4 **Slots**

Cable Entry Direction

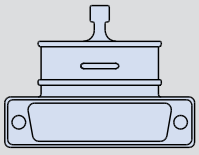


Fig. 5 **Long Side Entry (1)**

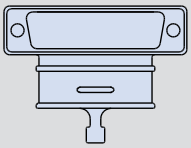
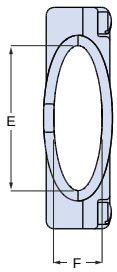


Fig. 6 **Short Side Entry (2)**

Ordering Information

Sample Part Number	289S008	ME	6	A	-T	S	K	2
Basic Part Number	**289T008** = Top Entry (*Fig. 1*) **289S008** = Side Entry (*Fig. 2*)							
Finish	**ME** = Electroless Nickel (RoHS) **Z2** = Gold (RoHS)							
Shell Size	**1** = Shell Size 1 **2** = Shell Size 2 **3** = Shell Size 3 **4** = Shell Size 4 **5** = Shell Size 5 **6** = Shell Size 6							
Entry Size	**A, B, C or D** See Cable Entry Size Table Below							
Qwik-Ty™ Option	**N** = Supplied without Qwik-Ty™ **T** = With Qwik-Ty™ Strain Relief (*Fig. 3*)							
Slot Option	**N** = Supplied without Slots **S** = With Slots for Terminating Individual Shields (*Fig. 4*)							
EMI/RFI Band	**N** = Supplied without Band **K** = Supplied with Pre-Coiled Band (600-052-1)							
Cable Entry Direction	***Omit for 289T008. Applies only to 289S008.*** **1** = Cable Entry on Long Side of Shell Keystone (*Fig. 5*) **2** = Cable Entry on Short Side of Shell Keystone (*Fig. 6*)							

Cable Entry Size



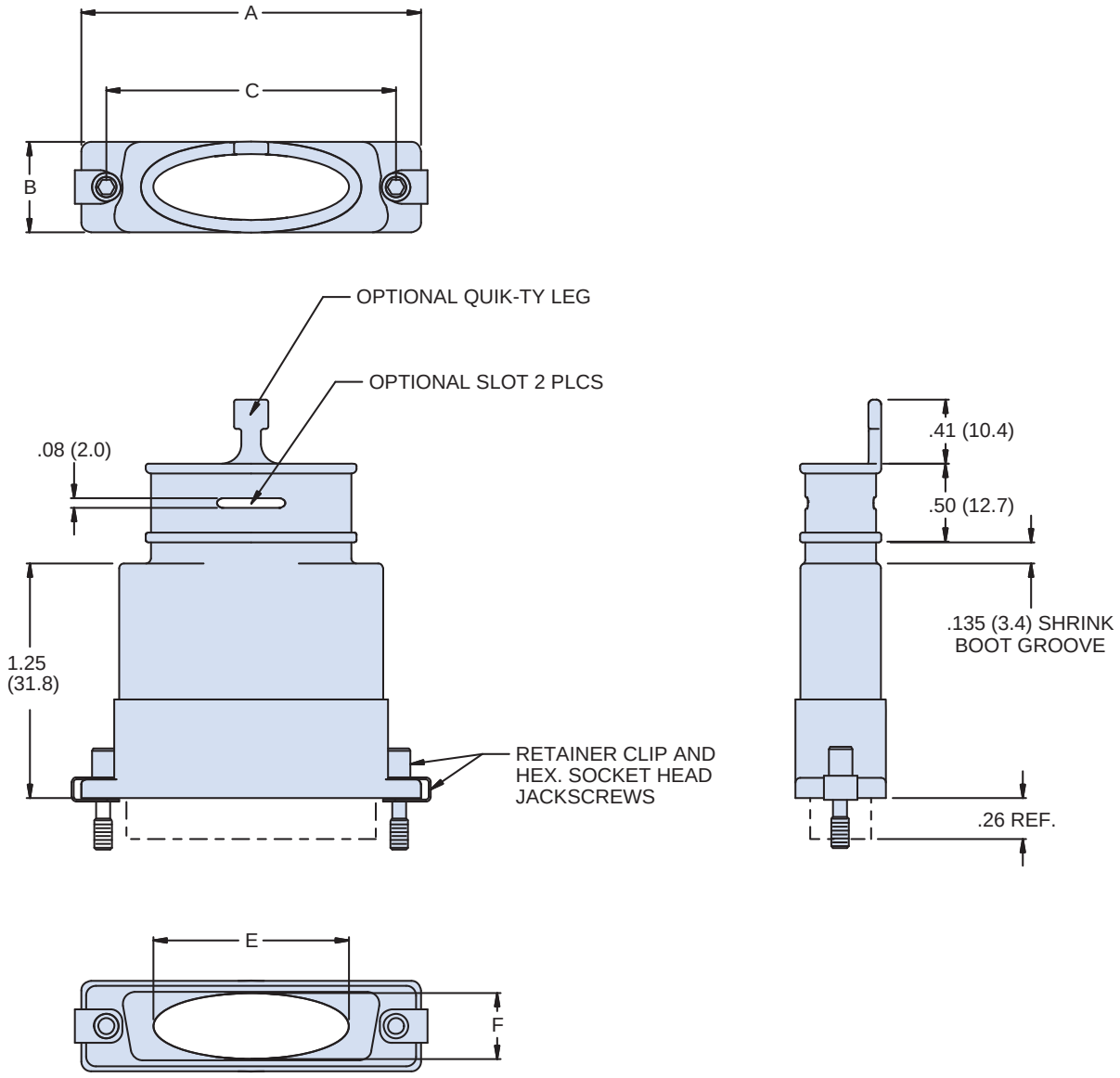
Shell Size	Entry Size A				Entry Size B				Entry Size C				Entry Size D			
	E		F		E		F		E		F		E		F	
	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm
1	.143	3.63	.143	3.63	.195	4.95	.195	4.95	.242	6.15	.242	6.15	.438	11.13	.375	9.53
2	.188	4.78	.188	4.78	.256	6.50	.256	6.50	.480	12.19	.375	9.53	.688	17.48	.375	9.53
3	.245	6.22	.245	6.22	.550	13.97	.375	9.53	.780	19.81	.375	9.53	1.125	28.58	.375	9.53
4	.291	7.39	.291	7.39	.800	20.32	.375	9.53	1.260	32.00	.375	9.53	1.813	46.05	.375	9.53
5	.326	8.28	.326	8.28	.770	19.56	.485	12.32	1.250	31.75	.485	12.32	1.750	44.45	.485	12.32
6	.376	9.55	.376	9.55	.863	21.92	.550	13.97	1.323	33.60	.550	13.97	1.875	47.63	.550	13.97

Dimensions in Inches (millimeters) are subject to change without notice.

Solid Shell Low-Profile EMI Backshell, Elliptical Entry, Environmental

289T008 top entry dimensions

289T008 DIMENSIONS

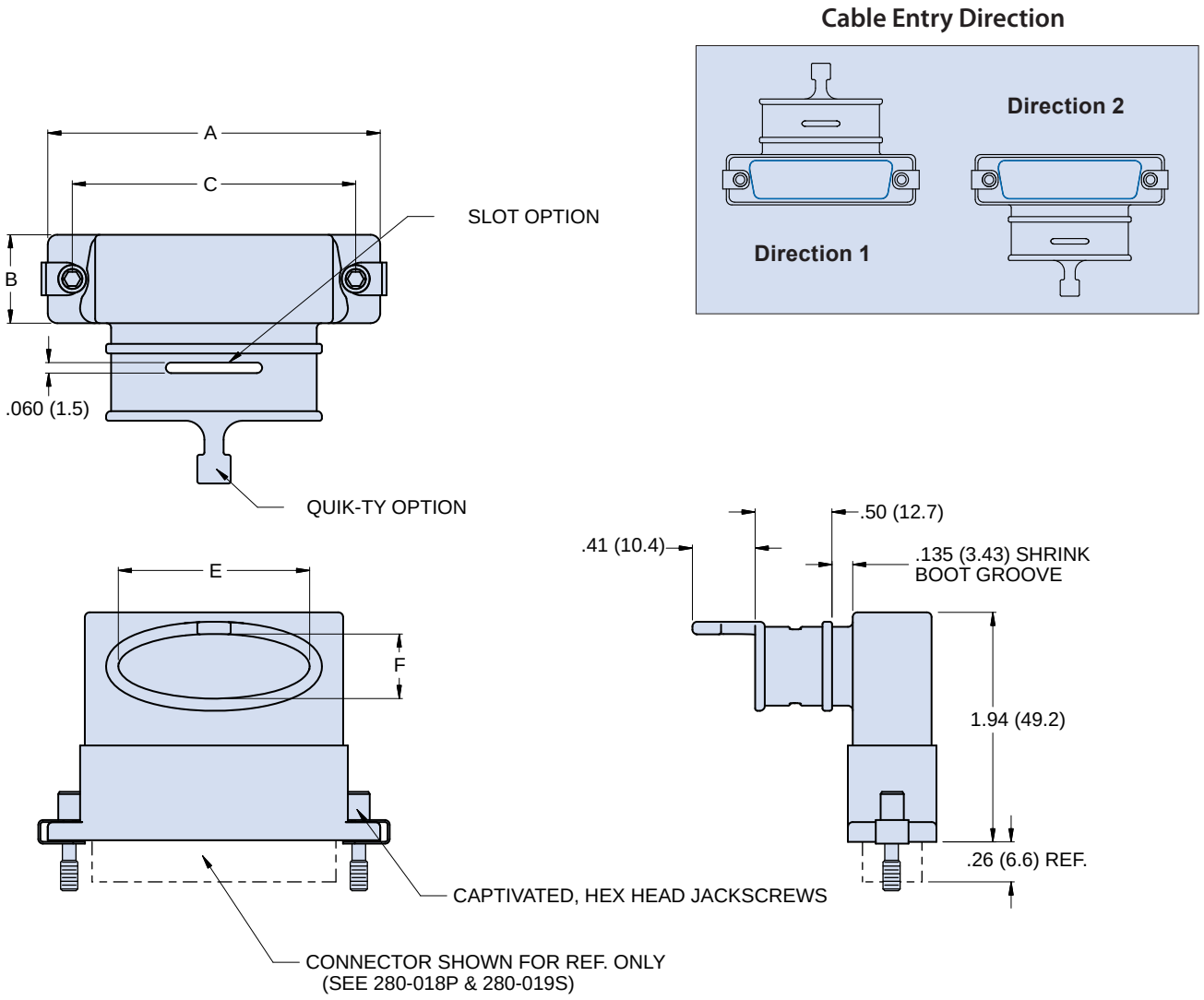


Dimensions																						
Shell Size	A Max		B Max		C Basic		Entry Size A				Entry Size B				Entry Size C				Entry Size D			
							E		F		E		F		E		F		E		F	
	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm
1	1.395	35.43	.624	15.85	.984	24.99	.143	3.63	.143	3.63	.195	4.95	.195	4.95	.242	6.15	.242	6.15	.438	11.13	.375	9.53
2	1.706	43.33	.624	15.85	1.312	33.32	.188	4.78	.188	4.78	.256	6.50	.256	6.50	.480	12.19	.375	9.53	.688	17.48	.375	9.53
3	2.265	57.53	.624	15.85	1.852	47.04	.245	6.22	.245	6.22	.550	13.97	.375	9.53	.780	19.81	.375	9.53	1.125	28.58	.375	9.53
4	2.900	73.66	.624	15.85	2.500	63.50	.291	7.39	.291	7.39	.800	20.32	.375	9.53	1.260	32.00	.375	9.53	1.813	46.05	.375	9.53
5	2.800	71.12	.750	19.05	2.406	61.11	.326	8.28	.326	8.28	.770	19.56	.485	12.32	1.250	31.75	.485	12.32	1.750	44.45	.485	12.32
6	2.900	73.66	.844	21.44	2.500	63.50	.376	9.55	.376	9.55	.863	21.92	.550	13.97	1.323	33.60	.550	13.97	1.875	47.63	.550	13.97

Solid Shell Low-Profile EMI Backshell, Elliptical Entry, Environmental

289S008 side entry dimensions

289S008 DIMENSIONS



Dimensions																						
Shell Size	A Max		B Max		C Basic		Entry Size A				Entry Size B				Entry Size C				Entry Size D			
							E		F		E		F		E		F		E		F	
	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm
1	1.395	35.43	.624	15.85	.984	24.99	.143	3.63	.143	3.63	.195	4.95	.195	4.95	.242	6.15	.242	6.15	.438	11.13	.375	9.53
2	1.706	43.33	.624	15.85	1.312	33.32	.188	4.78	.188	4.78	.256	6.50	.256	6.50	.480	12.19	.375	9.53	.688	17.48	.375	9.53
3	2.265	57.53	.624	15.85	1.852	47.04	.245	6.22	.245	6.22	.550	13.97	.375	9.53	.780	19.81	.375	9.53	1.125	28.58	.375	9.53
4	2.900	73.66	.624	15.85	2.500	63.50	.291	7.39	.291	7.39	.800	20.32	.375	9.53	1.260	32.00	.375	9.53	1.813	46.05	.375	9.53
5	2.800	71.12	.750	19.05	2.406	61.11	.326	8.28	.326	8.28	.770	19.56	.485	12.32	1.250	31.75	.485	12.32	1.750	44.45	.485	12.32
6	2.900	73.66	.844	21.44	2.500	63.50	.376	9.55	.376	9.55	.863	21.92	.550	13.97	1.323	33.60	.550	13.97	1.875	47.63	.550	13.97

Solid Shell EMI Backshell, Environmental, Panel Mount

289T007 top entry, 289B007 45º entry, 289S007 side entry

FOR USE WITH GLENAIR SERIES 28 HIPER-D CONNECTORS

289-007 backshell fits panel mount HiPer-D® connectors. Available in straight, right angle and 45° versions. Aluminum or stainless steel body, fluorosilicone rubber gasket and stainless steel screws. Design also features a boot groove for the attachment of Series 77 heatshrink boots. Terminate cable shield with optional Band-Master ATS® band. Optional slot allows easy termination of multiple individual cable shields. Attach cable ties to optional Qwik-Ty™ leg.

Entry Style

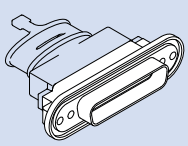


Fig. 1
Top Entry 289T007

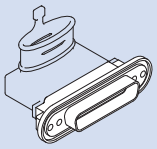


Fig. 2
Side Entry 289S007

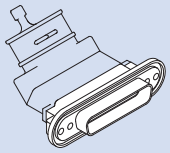


Fig. 3
45º Entry 289B007

Qwik-Ty™ Option

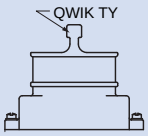


Fig. 4
Qwik-Ty™

Slot Option

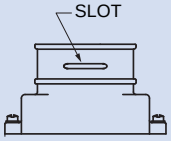


Fig. 5
Slots

Cable Entry Direction

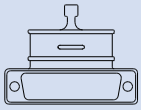


Fig. 6
Long Side Entry (1)

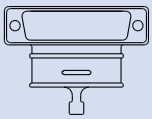


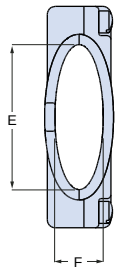
Fig. 7
Short Side Entry (2)

Ordering Information

Sample Part Number	289B007	ME	2	C	-T	N	N	1

Basic Part Number	**289T007** = Top Entry (*Fig. 1*) **289S007** = Side Entry (*Fig. 2*) **289B007** = 45º Entry (*Fig. 3*)
Finish	**ME** = Electroless Nickel (RoHS) **Z2** = Gold (RoHS)
Shell Size	**1** = Shell Size 1 **2** = Shell Size 2 **3** = Shell Size 3 **4** = Shell Size 4 **5** = Shell Size 5 **6** = Shell Size 6
Entry Size	**A, B, C or D** See Cable Entry Size Table Below
Qwik-Ty™ Option	**N** = Supplied without Qwik-Ty™ **T** = With Qwik-Ty™ Strain Relief (*Fig. 4*)
Slot Option	**N** = Supplied without Slots **S** = With Slots for Terminating Individual Shields (*Fig. 5*)
EMI/RFI Band	**N** = Supplied without Band **K** = Supplied with Pre-Coiled Band (600-052-1)
Cable Entry Direction	***Omit for 289T007. Applies only to 289S007 and 289B007.*** **1** = Cable Entry on Long Side of Shell Keystone (*Fig. 6*) **2** = Cable Entry on Short Side of Shell Keystone (*Fig. 7*)

Cable Entry Size

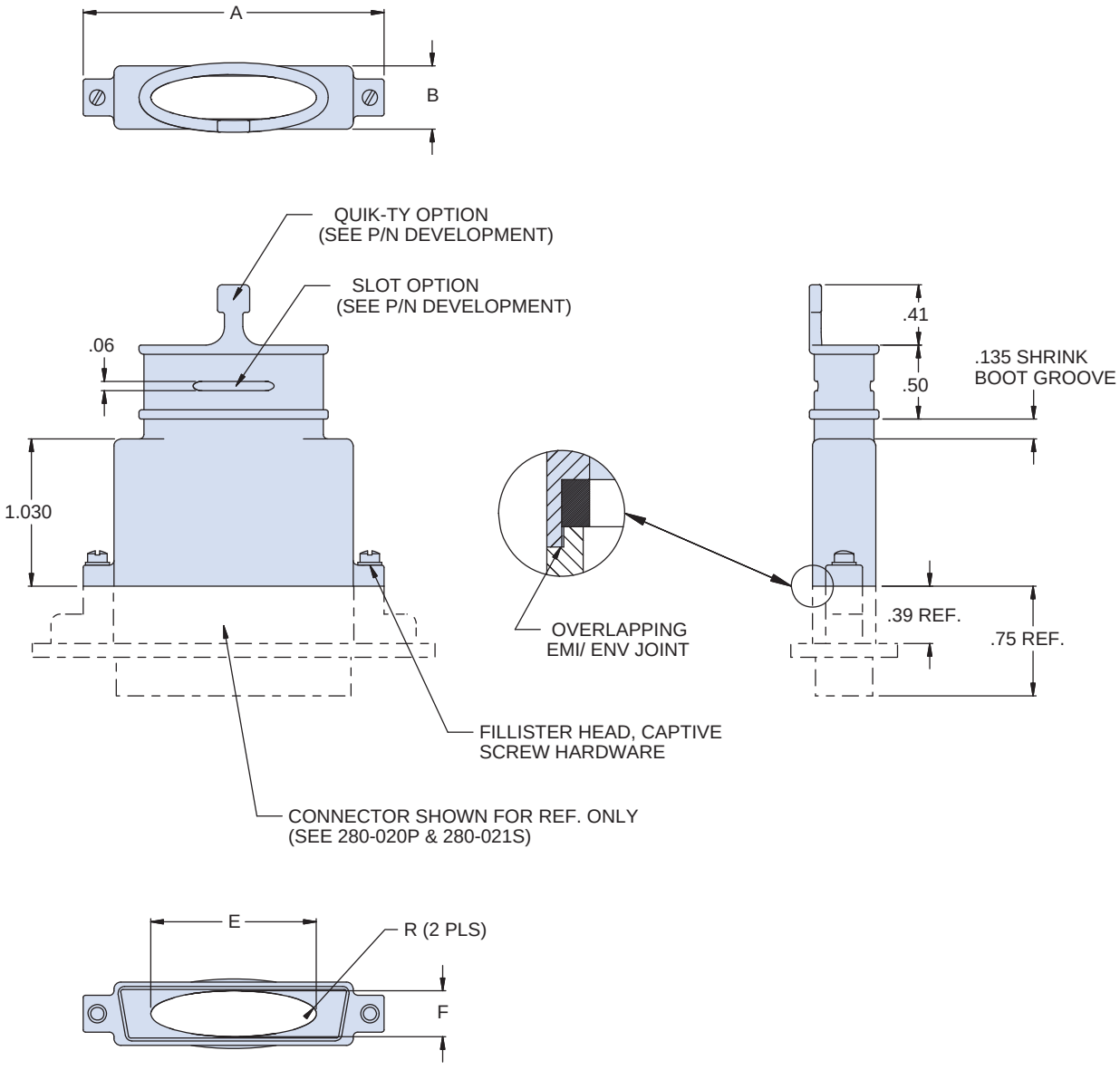


Shell Size	Entry Size A				Entry Size B				Entry Size C				Entry Size D			
	E		F		E		F		E		F		E		F	
	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm
1	.143	3.63	.143	3.63	.195	4.95	.195	4.95	.242	6.15	.242	6.15	.438	11.13	.375	9.53
2	.188	4.78	.188	4.78	.256	6.50	.256	6.50	.480	12.19	.375	9.53	.688	17.48	.375	9.53
3	.245	6.22	.245	6.22	.550	13.97	.375	9.53	.780	19.81	.375	9.53	1.125	28.58	.375	9.53
4	.291	7.39	.291	7.39	.800	20.32	.375	9.53	1.260	32.00	.375	9.53	1.813	46.05	.375	9.53
5	.326	8.28	.326	8.28	.770	19.56	.485	12.32	1.250	31.75	.485	12.32	1.750	44.45	.485	12.32
6	.376	9.55	.376	9.55	.863	21.92	.550	13.97	1.323	33.60	.550	13.97	1.875	47.63	.550	13.97

Solid Shell EMI Backshell, Environmental, Panel Mount

289T007 top entry dimensions

289T007 DIMENSIONS



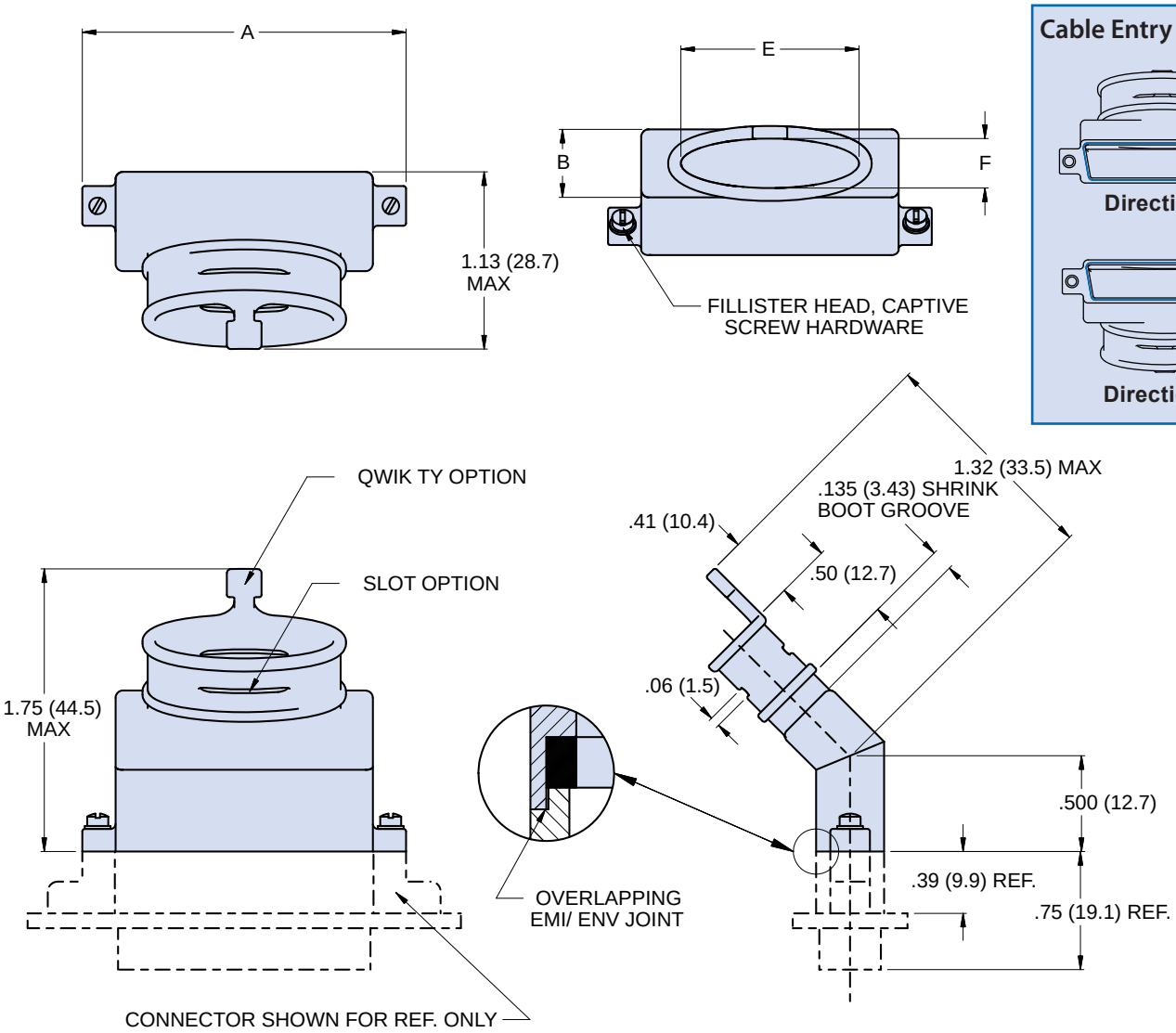
Dimensions																										
Shell Size	A Max		B Max		Entry Size A				Entry Size B						Entry Size C						Entry Size D					
					E		F		E		F		R		E		F		R		E		F		R	
	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm
1	1.181	30.00	.526	13.36	.143	3.63	.143	3.63	.195	4.95	.195	4.95	N/A		.242	6.15	.242	6.15	N/A		.438	11.13	.375	9.53	.160	4.06
2	1.506	38.25	.526	13.36	.188	4.78	.188	4.78	.256	6.50	.256	6.50	N/A		.480	12.19	.375	9.53	.125	3.18	.688	17.48	.375	9.53	.130	3.30
3	2.046	51.97	.526	13.36	.245	6.22	.245	6.22	.550	13.97	.375	9.53	.125	3.18	.780	19.81	.375	9.53	.125	3.18	1.125	28.58	.375	9.53	.109	2.77
4	2.694	68.43	.526	13.36	.291	7.39	.291	7.39	.800	20.32	.375	9.53	.125	3.18	1.260	32.00	.375	9.53	.125	3.18	1.813	46.05	.375	9.53	.109	2.77
5	2.600	66.04	.628	15.92	.326	8.28	.326	8.28	.770	19.56	.485	12.32	.156	3.96	1.250	31.75	.485	12.32	.156	3.96	1.750	44.45	.485	12.32	.125	3.18
6	2.694	68.43	.690	17.53	.376	9.55	.376	9.55	.863	21.92	.550	13.97	.188	4.78	1.323	33.60	.550	13.97	.156	3.96	1.875	47.63	.550	13.97	.125	3.18

Dimensions in Inches (millimeters) are subject to change without notice.

Solid Shell EMI Backshell, Environmental, Panel Mount

289B007 45º entry dimensions

289B007 DIMENSIONS

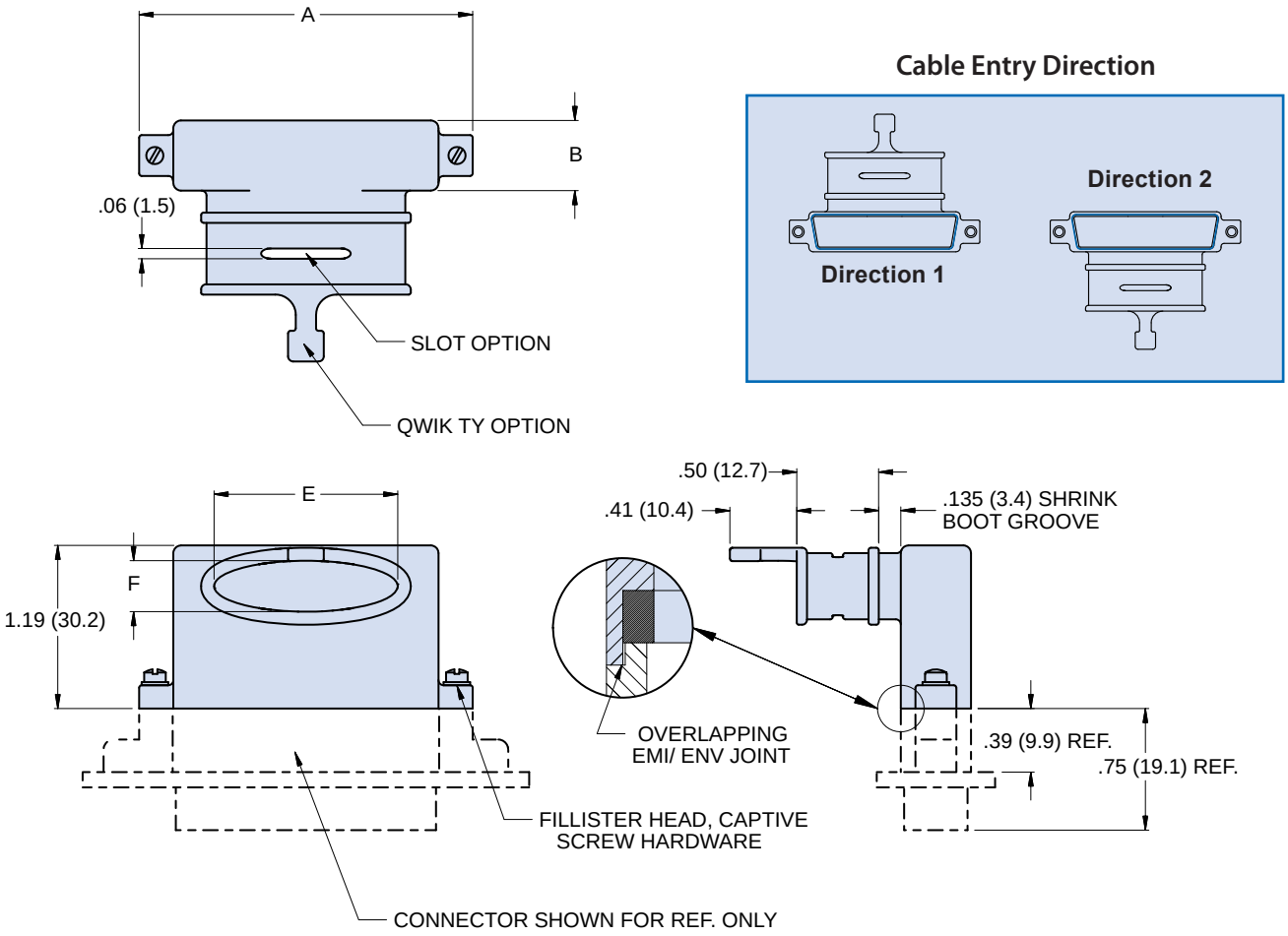


Dimensions																				
Shell Size	A Max		B Max		Entry Size A				Entry Size B				Entry Size C				Entry Size D			
					E		F		E		F		E		F		E		F	
	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm
1	1.181	30.00	.526	13.36	.143	3.63	.143	3.63	.195	4.95	.195	4.95	.242	6.15	.242	6.15	.438	11.13	.375	9.53
2	1.506	38.25	.526	13.36	.188	4.78	.188	4.78	.256	6.50	.256	6.50	.480	12.19	.375	9.53	.688	17.48	.375	9.53
3	2.046	51.97	.526	13.36	.245	6.22	.245	6.22	.550	13.97	.375	9.53	.780	19.81	.375	9.53	1.125	28.58	.375	9.53
4	2.694	68.43	.526	13.36	.291	7.39	.291	7.39	.800	20.32	.375	9.53	1.260	32.00	.375	9.53	1.813	46.05	.375	9.53
5	2.600	66.04	.628	15.92	.326	8.28	.326	8.28	.770	19.56	.485	12.32	1.250	31.75	.485	12.32	1.750	44.45	.485	12.32
6	2.694	68.43	.690	17.53	.376	9.55	.376	9.55	.863	21.92	.550	13.97	1.323	33.60	.550	13.97	1.875	47.63	.550	13.97

Solid Shell EMI Backshell, Environmental, Panel Mount

289S007 side entry dimensions

289S007 DIMENSIONS

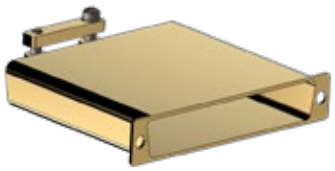


Dimensions																				
Shell Size	A Max		B Max		SIZE A				SIZE B				SIZE C				SIZE D			
					E		F		E		F		E		F		E		F	
	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm
1	1.181	30.00	.526	13.36	.143	3.63	.143	3.63	.195	4.95	.195	4.95	.242	6.15	.242	6.15	.438	11.13	.375	9.53
2	1.506	38.25	.526	13.36	.188	4.78	.188	4.78	.256	6.50	.256	6.50	.480	12.19	.375	9.53	.688	17.48	.375	9.53
3	2.046	51.97	.526	13.36	.245	6.22	.245	6.22	.550	13.97	.375	9.53	.780	19.81	.375	9.53	1.125	28.58	.375	9.53
4	2.694	68.43	.526	13.36	.291	7.39	.291	7.39	.800	20.32	.375	9.53	1.260	32.00	.375	9.53	1.813	46.05	.375	9.53
5	2.600	66.04	.628	15.92	.326	8.28	.326	8.28	.770	19.56	.485	12.32	1.250	31.75	.485	12.32	1.750	44.45	.485	12.32
6	2.694	68.43	.690	17.53	.376	9.55	.376	9.55	.863	21.92	.550	13.97	1.323	33.60	.550	13.97	1.875	47.63	.550	13.97

ESCC type for MIL-DTL-24308 D-Subminiature Connectors

Ordering information / ESCC part number cross-reference

BACKSHELL, LIGHTWEIGHT DESIGN WITH SADDLE CLAMPS FOR STRAIN RELIEF IAW ESCC 3401/072, TYPE VARIANTS 05, 06, 07, 08, 09, AND 72



MATERIAL/FINISH NOTES

Backshell: Al Aluminum Alloy with 30 micro-inches Gold (min.) over electroless nickel per ESCC No. 3401/072 Para. 4.4.2

Alternate finish code A174 per ESCC3401/072 available (Glenair Electroless Nickel code ME), consult factory

Hardware: Brass with 0.7µm Gold (min.) over 1µm copper (min.)

For dimensions and weight see ESCC3401/072

How To Order Glenair 557-433 Commercial Equivalent					
Sample Part Number		**557-433**	**GME**	**-1**	**A**
ESCC Series	Lightweight strain relief clamp with saddle bars				
Finish Symbol	**GME** = Gold over Electroless Nickel per ESCC No. 3401/072 Para. 4.4.2				
Shell Size	**1**=E, **2**=A, **3**=B, **4**=C, **5**=D, **6**=F				
Alternate Design	**A** = Alternate design per ESCC Detail Specification 3401/072 Figure 2(b) **Omit** for standard				

ESCC 3401/072 to Glenair P/N cross-reference			
Size	**ESCC P/N**	**Size**	**Glenair P/N**
E	340107205BNMBA	1	557-433GME-1A
A	340107206BNMBA	2	557-433GME-2A
B	340107207BNMBA	3	557-433GME-3A
C	340107208BNMBA	4	557-433GME-4A
D	340107209BNMBA	5	557-433GME-5A
F	340107272BNMB	6	557-433GME-6

"A" at the end of part number = Alternate design. Omit for standard.
Alternate design not available on size F (6)

SHORTING CAP, LIGHTWEIGHT DESIGN IAW ESCC 3401/072, TYPE VARIANTS 10, 11, 12, 13, 14, AND 73

MATERIAL/FINISH NOTES

Backshell: Al Aluminum Alloy with 30 micro-inches Gold (min.) over electroless nickel per ESCC No. 3401/072 Para. 4.4.2

Alternate finish code A174 per ESCC3401/072 available (Glenair Electroless Nickel code ME), consult factory

Hardware: Brass with 0.7µm Gold (min.) over 1µm copper (min.)

For dimensions and weight see ESCC3401/072

How To Order Glenair 557-434 Commercial Equivalent					
Sample Part Number		**557-434**	**GME**	**-2**	**A**
ESCC Series	Lightweight shorting cap				
Finish Symbol	**GME** = Gold over Electroless Nickel per ESCC No. 3401/072 Para. 4.4.2				
Shell Size	**1**=E, **2**=A, **3**=B, **4**=C, **5**=D, **6**=F				
Alternate Design	**A** = Alternate design per ESCC Detail Specification 3401/072 Figure 2(c) **Omit** for standard				

ESCC 3401/072 to Glenair P/N cross-reference			
Size	**ESA P/N**	**Size**	**Glenair P/N**
E	340107210BNMBA	1	557-434GME-1A
A	340107211BNMBA	2	557-434GME-2A
B	340107212BNMBA	3	557-434GME-3A
C	340107213BNMBA	4	557-434GME-4A
D	340107214BNMBA	5	557-434GME-5A
F	340107273BNMB	6	557-434GME-6

"A" at the end of part number = Alternate design. Omit for standard.
Alternate design not available on size F (6)

ESCC type for MIL-DTL-24308 D-Subminiature Connectors

Ordering information / ESCC part number cross-reference

SPACE GRADE
NASA
ESA, JAXA
SCREENED

EMI/RFI BANDING BACKSHELL, 90° LONGITUDINAL OUTLET, LIGHTWEIGHT DESIGN IAW ESCC 3401/072, TYPE VARIANTS 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, AND 76

How To Order Glenair 557-435 Commercial Equivalent						
Sample Part Number	**557-435**	**GME**	**-2**	**L**	**A**	
ESCC Series	Lightweight EMI/RFI banding backshell					
Finish Symbol	**GME** = Gold over Electroless Nickel per ESCC No. 3401/072 Para. 4.4.2					
Shell Size	**1**=E, **2**=A, **3**=B, **4**=C, **5**=D, **6**=F					
Entry Direction	**L** = Left outlet **R** = Right outlet **Omit** for Shell Size 6					
Alternate Design	**A** = Alternate design per ESCC Detail Specification 3401/072 Figure 2(e) **Omit** for standard					

MATERIAL/FINISH NOTES

Backshell: Al Aluminum Alloy with 30 micro-inches Gold (min.) over electroless nickel per ESCC No. 3401/072 Para. 4.4.2

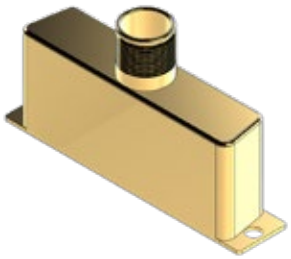
Alternate finish code A174 per ESCC3401/072 available (Glenair Electroless Nickel code ME), consult factory

Hardware: Brass with 0.7µm Gold (min.) over 1µm copper (min.)

For dimensions and weight see ESCC3401/072

ESA/ESCC3401/072 to Glenair P/N cross-reference			
Size	**ESA P/N**	**Size**	**Glenair P/N**
E	340107225BNMBA	**1**	557-435GME-1RA
	340107230BNMBA		557-435GME-1LA
A	340107226BNMBA	**2**	557-435GME-2RA
	340107231BNMBA		557-435GME-2LA
B	340107227BNMBA	**3**	557-435GME-3RA
	340107232BNMBA		557-435GME-3LA
C	340107228BNMBA	**4**	557-435GME-4RA
	340107233BNMBA		557-435GME-4LA
D	340107229BNMBA	**5**	557-435GME-5RA
	340107234BNMBA		557-435GME-5LA
F	340107276BNMB	**6**	557-435GME-6

EMI/RFI BANDING BACKSHELL, STRAIGHT OUTLET, LIGHTWEIGHT DESIGN IAW ESCC 3401/072, TYPE VARIANTS 35, 36, 37, 38, 39 AND 77



How To Order Glenair 557-436 Commercial Equivalent					
Sample Part Number	**557-436**	**GME**	**-2**	**A**	
ESCC Series	Lightweight EMI/RFI banding backshell				
Finish Symbol	**GME** = Gold over Electroless Nickel per ESCC No. 3401/072 Para. 4.4.2				
Shell Size	**1**=E, **2**=A, **3**=B, **4**=C, **5**=D, **6**=F				
Alternate Design	**A** = Alternate design per ESCC Detail Specification 3401/072 Figure 2(f) **Omit** for standard				

MATERIAL/FINISH NOTES

Backshell: Al Aluminum Alloy with 30 micro-inches Gold (min.) over electroless nickel per ESCC No. 3401/072 Para. 4.4.2

Alternate finish code A174 per ESCC3401/072 available (Glenair Electroless Nickel code ME), consult factory

Hardware: Brass with 0.7µm Gold (min.) over 1µm copper (min.)

For dimensions and weight see ESCC3401/072

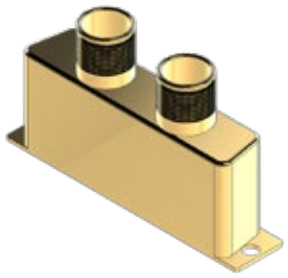
ESCC 3401/072 to Glenair P/N cross-reference			
Size	**ESA P/N**	**Size**	**Glenair P/N**
E	340107235BNMBA	**1**	557-436GME-1A
A	340107236BNMBA	**2**	557-436GME-2A
B	340107237BNMBA	**3**	557-436GME-3A
C	340107238BNMBA	**4**	557-436GME-4A
D	340107239BNMBA	**5**	557-436GME-5A
F	340107277BNMB	**6**	557-436GME-6

"A" at the end of part number = Alternate design. Omit for standard.
Alternate design not available on size F (6)

ESCC type for MIL-DTL-24308 D-Subminiature Connectors

Ordering information / ESCC part number cross-reference

EMI/RFI BANDING BACKSHELL, DUAL ENTRY, LIGHTWEIGHT DESIGN IAW ESCC 3401/072, 40 TYPE VARIANT



How To Order Glenair 557-437 Commercial Equivalent				
Sample Part Number		**557-437**	**GME**	**-2**
ESCC Series	Lightweight EMI/RFI banding backshell, dual entry			
Finish Symbol	**GME** = Gold over Electroless Nickel per ESCC No. 3401/072 Para. 4.4.2			
Shell Size	**2**=A			

MATERIAL/FINISH NOTES

Backshell: Al Aluminum Alloy with 30 micro-inches Gold (min.) over electroless nickel per ESCC No. 3401/072 Para. 4.4.2

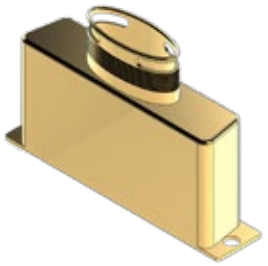
Alternate finish code A174 per ESCC3401/072 available (Glenair Electroless Nickel code ME), consult factory

Hardware: Brass with 0.7µm Gold (min.) over 1µm copper (min.)

For dimensions and weight see ESCC3401/072 Figure 2(g)

ESCC 3401/072 to Glenair P/N cross-reference			
Size	**ESCC P/N**	**Size**	**Glenair P/N**
A	340107240BNMB	**2**	557-437GME-2

EMI/RFI BANDING BACKSHELL, ULTRA ELLIPTICAL STRAIGHT ENTRY IAW ESCC3401/072, TYPE VARIANTS 46, 47, 48, 49, 50, AND 78



How To Order Glenair 557-438 Commercial Equivalent					
Sample Part Number		**557-438**	**GME**	**-1**	**A**
ESCC Series	Lightweight EMI/RFI banding backshell				
Finish Symbol	**GME** = Gold over Electroless Nickel per ESCC No. 3401/072 Para. 4.4.2				
Shell Size	**1**=E, **2**=A, **3**=B, **4**=C, **5**=D, **6**=F				
Alternate Design	**A** = Alternate design per ESCC Detail Specification 3401/072 Figure 2(i) **Omit** for standard				

MATERIAL/FINISH NOTES

Backshell: Al Aluminum Alloy with 30 micro-inches Gold (min.) over electroless nickel per ESCC No. 3401/072 Para. 4.4.2

Alternate finish code A174 per ESCC3401/072 available (Glenair Electroless Nickel code ME), consult factory

Hardware: Brass with 0.7µm Gold (min.) over 1µm copper (min.)

For dimensions and weight see ESCC3401/072

ESCC 3401/072 to Glenair P/N cross-reference			
Size	**ESA P/N**	**Size**	**Glenair P/N**
E	340107246BNMBA	**1**	557-438GME-1A
A	340107247BNMBA	**2**	557-438GME-2A
B	340107248BNMBA	**3**	557-438GME-3A
C	340107249BNMBA	**4**	557-438GME-4A
D	340107250BNMBA	**5**	557-438GME-5A
F	340107278BNMB	**6**	557-438GME-6

"A" at the end of part number = Alternate design. Omit for standard.
Alternate design not available on size F (6)

ESCC type for MIL-DTL-24308 D-Subminiature Connectors

Ordering information / ESCC part number cross-reference

SPACE GRADE
NASA
ESA, JAXA
SCREENED

EMI/RFI BANDING BACKSHELL, ULTRA ELLIPTICAL 45° ENTRY IAW ESCC3401/072, TYPE VARIANTS 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, AND 79

How To Order Glenair 557-439 Commercial Equivalent						
Sample Part Number		**557-439**	**GME**	**-2**	**R**	**A**
ESCC Series	Lightweight EMI/RFI banding backshell					
Finish Symbol	**GME** = Gold over Electroless Nickel per ESCC No. 3401/072 Para. 4.4.2					
Shell Size	**1**=E, **2**=A, **3**=B, **4**=C, **5**=D, **6**=F					
Entry Direction	**L** = Left outlet **R** = Right outlet **Omit** for Shell Size 6					
Alternate Design	**A** = Alternate design per ESCC Detail Specification 3401/072 Figure 2(j) **Omit** for standard					

MATERIAL/FINISH NOTES

Backshell: Al Aluminum Alloy with 30 micro-inches Gold (min.) over electroless nickel per ESCC No. 3401/072 Para. 4.4.2

Alternate finish code A174 per ESCC3401/072 available (Glenair Electroless Nickel code ME), consult factory

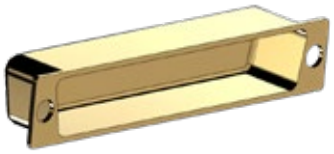
Hardware: Brass with 0.7µm Gold (min.) over 1µm copper (min.)

For dimensions and weight see ESCC3401/072

ESA/ESCC3401/072 to Glenair P/N cross-reference			
Size	**ESA P/N**	**Size**	**Glenair P/N**
E	340107251BNMBA	1	557-439GME-1RA
	340107256BNMBA		557-439GME-1LA
A	340107252BNMBA	2	557-439GME-2RA
	340107257BNMBA		557-439GME-2LA
B	340107253BNMBA	3	557-439GME-3RA
	340107258BNMBA		557-439GME-3LA
C	340107254BNMBA	4	557-439GME-4RA
	340107259BNMBA		557-439GME-4LA
D	340107255BNMBA	5	557-439GME-5RA
	340107260BNMBA		557-439GME-5LA
F	340107279BNMB	6	557-439GME-6

"A" at the end of part number = Alternate design. Omit for standard.
Alternate design not available on size F (6)

EXTRA SHORTING CAN, LIGHTWEIGHT DESIGN IAW ESCC3401/072, TYPE VARIANTS 61, 62, 63, 64, 65, AND 80



How To Order Glenair 557-440 Commercial Equivalent					
Sample Part Number		**557-440**	**GME**	**-2**	**A**
ESCC Series	Lightweight extra shorting can				
Finish Symbol	**GME** = Gold over Electroless Nickel per ESCC No. 3401/072 Para. 4.4.2				
Shell Size	**1**=E, **2**=A, **3**=B, **4**=C, **5**=D, **6**=F				
Alternate Design	**A** = Alternate design per ESCC Detail Specification 3401/072 Figure 2(k) **Omit** for standard				

MATERIAL/FINISH NOTES

Backshell: Al Aluminum Alloy with 30 micro-inches Gold (min.) over electroless nickel per ESCC No. 3401/072 Para. 4.4.2

Alternate finish code A174 per ESCC3401/072 available (Glenair Electroless Nickel code ME), consult factory

Hardware: Brass with 0.7µm Gold (min.) over 1µm copper (min.)

For dimensions and weight see ESCC3401/072

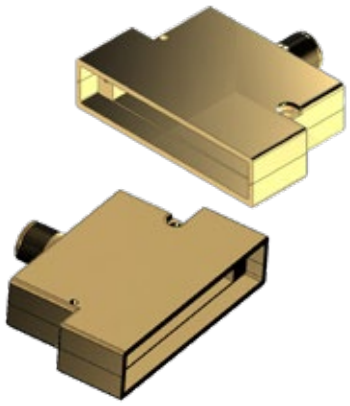
ESA/ESCC3401/072 to Glenair P/N cross-reference			
Size	**ESA P/N**	**Size**	**Glenair P/N**
E	340107261BNMBA	1	557-440GME-1A
A	340107262BNMBA	2	557-440GME-2A
B	340107263BNMBA	3	557-440GME-3A
C	340107264BNMBA	4	557-440GME-4A
D	340107265BNMBA	5	557-440GME-5A
F	340107280BNMB	6	557-440GME-6

"A" at the end of part number = Alternate design. Omit for standard.
Alternate design not available on size F (6)

ESCC type for MIL-DTL-24308 D-Subminiature Connectors

Ordering information / ESCC part number cross-reference

EMI/RFI BANDING BACKSHELL, STRAIGHT OUTLET, FRONT OR REAR MOUNT, LIGHTWEIGHT DESIGN IAW ESCC 3401/072, TYPE VARIANTS 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 74, AND 75



How To Order Glenair 550T072Commercial Equivalent						
Sample Part Number	**550T072**	**GME**	**-2**	**F**	**-A**	
ESCC Series	Lightweight EMI/RFI banding backshell					
Finish Symbol	**GME** = Gold over Electroless Nickel per ESCC No. 3401/072 Para. 4.4.2					
Shell Size	**1**=E, **2**=A, **3**=B, **4**=C, **5**=D, **6**=F					
Receptacle Mounting	**F** = Front mount **R1** = Rear mount					
Alternate Design	**A** = Alternate design per ESCC Detail Specification 3401/072 Figure 2(d) **Omit** for standard					

MATERIAL/FINISH NOTES

Backshell: Al Aluminum Alloy with 30 micro-inches Gold (min.) over electroless nickel per ESCC No. 3401/072 Para. 4.4.2

Alternate finish code A174 per ESCC3401/072 available (Glenair Electroless Nickel code ME), consult factory

Hardware: Brass with 0.7µm Gold (min.) over 1µm copper (min.)

For dimensions and weight see ESCC3401/072

ESCC 3401/072 to Glenair P/N cross-reference			
Size	**ESA P/N**	**Size**	**Glenair P/N**
E	340107215BNMBA	1	550T072GME-1F-A
	340107220BNMBA		550T072GME-1R1-A
A	340107216BNMBA	2	550T072GME-2F-A
	340107221BNMBA		550T072GME-2R1-A
B	340107217BNMBA	3	550T072GME-3F-A
	340107222BNMBA		550T072GME-3R1-A
C	340107218BNMBA	4	550T072GME-4F-A
	340107223BNMBA		550T072GME-4R1-A
D	340107219BNMBA	5	550T072GME-5F-A
	340107224BNMBA		550T072GME-5R1-A
F	340107274BNMB	6	550T072GME-6F
	340107275BNMB		550T072GME-6R1

"A" at the end of part number = Alternate design. Omit for standard.
Alternate design not available on size F (6)

ESCC type for MIL-DTL-24308 D-Subminiature Connectors

Ordering information / ESCC part number cross-reference

SPACE GRADE
NASA
ESA, JAXA
SCREENED

BACKSHELL HARDWARE - MALE SCREW LOCK ASSEMBLIES IAW ESCC 3401/072, TYPE VARIANTS 70, 71

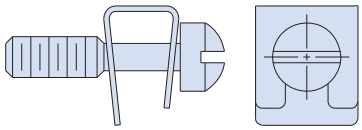
How To Order Glenair 6870-1124 Commercial Equivalent			
Sample Part Number		**6870-1124**	**M**
ESCC Series	Male screw lock assembly		
Jackscrew Style	**E** = Stainless Steel, Slotted Head **M** = Brass, Hex Socket Head		

MATERIAL/FINISH NOTES

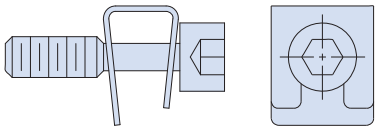
Jackscrews and Bracket: Stainless Steel or Brass with 30 micro-inches Gold (min.) over copper 40 micro-inches (min) per ESCC No. 3401/072 Para. 4.4.1

For dimensions and weight see ESCC3401/072

ESCC 3401/072 to Glenair P/N cross-reference	
ESCC P/N	**Glenair P/N**
340107270	6870-1124E
340107271	6870-1124M



SLOTTED HEAD
STYLE E



SOCKET HEAD SCREW
STYLE M

BACKSHELL HARDWARE - MALE SCREW LOCK ASSEMBLIES IAW ESCC 3401/072, TYPE VARIANTS 01, 02, 03, 04, 66, 67, 68, AND 69

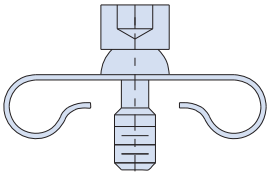
How To Order Glenair 6870-1129 Commercial Equivalent			
Sample Part Number		**6870-1129**	**-01**
ESCC Series	Male screw lock assembly		
Variant	See cross-ref table		

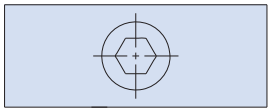
MATERIAL/FINISH NOTES

Jackscrews and Bracket: Brass with 30 micro-inches Gold (min.) over copper 40 micro-inches (min) per ESCC No. 3401/072 Para. 4.4.1

For dimensions and weight see ESCC3401/072

ESCC 3401/072 to Glenair P/N cross-reference			
ESCC P/N	**Glenair P/N**	**Material**	**Use with Shell Size**
340107201	6870-1129-01	Brass	DA to DC
340107202	6870-1129-02	Brass	DD
340107203	6870-1129-03	Stainless Steel	DA to DC
340107204	6870-1129-04	Stainless Steel	DD
340107266	6870-1129-66	Brass	DA to DC
340107267	6870-1129-67	Brass	DD
340107268	6870-1129-68	Stainless Steel	DA to DC
640107269	6870-1129-69	Stainless Steel	DD





Glenair Improved Designs for Removable-Entry and Cable Clamp Rectangular Backshells

557-652 and 557-653 (with IS-Sommer cross-reference)

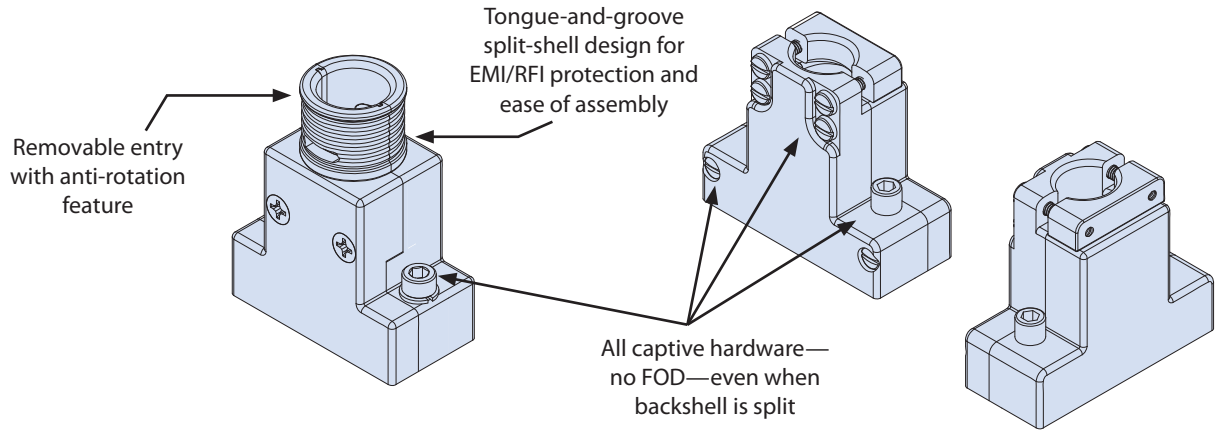
IS-Sommer rectangular connector accessories utilize a two-piece design with a separable band platform and loose/removable hardware. Glenair design improvements to this standard deliver serious performance in space and other high-performance application environments. Importantly, Glenair backshells of this type feature only captive hardware. Even when the two-piece backshell is split for assembly around the wired connector, Glenair hardware remains captive to the backshell body, eliminating the risk of FOD in sensitive space applications.

The architecture of the Glenair split shell design incorporates a sliding tongue-and-groove for superior EMC performance and ease of use. Also, unlike competitor solutions, the separable cable entry piece is captive when the backshell is assembled, and stays in position with an anti-rotation feature.

Glenair split-shell cable-clamp backshells likewise feature all captive hardware and a low-profile saddle-bar cable clamp. In general, the Glenair design facilitates faster, safer, trouble-free cable assembly.

Contact Glenair for detailed drawings and dimensional details.

GLENAIR IMPROVED DESIGN SPACE-GRADE BACKSHELL FEATURES: ROUND ENTRY BANDING AND CABLE-CLAMP VERSIONS



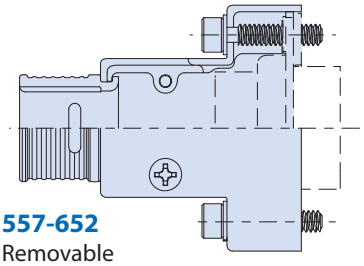
Removable round cable entry banding version

Cable clamp version

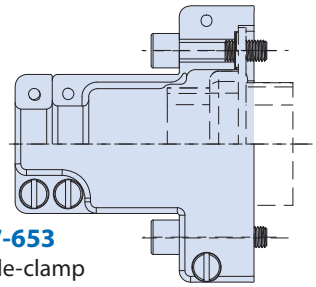
Glenair Improved Designs for Removable-Entry and Cable Clamp Rectangular Backshells

557-652 and 557-653 (with IS-Sommer cross-reference)

SPACE GRADE
NASA
ESA, JAXA
SCREENED



557-652
Removable round-entry banding



557-653
Cable-clamp

Glenair 557 Series Backshell to Sommer Cross-Reference	
557-652 Removable Round Entry Split Backshell	
Glenair Part Number	**Sommer Part Number**
557-652M106CC1	DW-214-09-1-6-9315
557-652M206CC1	DW-214-15-2-6-9316
557-652M306CC1	DW-214-25-3-6-9317
557-652M406CC1	DW-214-37-4-6-9318
557-652M507CC1	DW-214-50-5-6-9319
557-652M608CC1	Shell Size 6 not available
557-653 Cable Clamp Split Backshell, Rear Wall Mount	
Glenair Part Number	**Sommer Part Number**
557-653M1CC1	DW-214-09-1-6-0011
557-653M2CC1	DW-214-15-2-6-0012
557-653M3CC1	DW-214-25-3-6-0013
557-653M4CC1	DW-214-37-4-6-0014
557-653M5CC1	DW-214-50-5-6-0015
557-653M6CC1	DW-214-104-6-6-0016

Band-Master ATS®

Standard banding tools and bands

STANDARD BANDING TOOL

Color-coded tool handle:

= Standard; Black

The 601-100 Band-Master™ ATS Standard Tool with Counter for Standard Bands

Weighs approximately 1.30 lbs., and is designed for .240" width clamping bands in a tension range from 100 to 180 lbs. Calibrate at 150 lbs. ± 5 lbs. for most shield terminations. Tool and band should never be lubricated.

The 600-058 QPL Qualified (M81306/1A) Standard Banding Tool without Counter

Weighs 1.22 and is designed for .240" width clamping bands in a tension range from 100 to 180 lbs. Calibrate at 150 lbs. ± 5 lbs. for most shield terminations. Tool and band should never be lubricated (not shown).

Band-Master ATS® Standard Band Selection						
	Length		Part Number		Fits Diameter	
Bands	In.	mm.	Flat	Pre-Coiled	In.	mm.
Short Standard	9.0	228.6	601-005	601-006	1.0	25.4
Medium Standard	14.25	361.95	601-040	601-041	1.8	45.7
Long Standard	18.0	457.2	601-049	601-050	2.5	63.5

Cable Pull Strength for Band-Master ATS® Standard Bands							
Name	Material Type	Band Width		Band Thickness		Calibration Setting	Cable Pull Strength
		In	mm	In	mm		
Standard	300 SS	0.240	6.10	.020	.51	150 ±5 lbs	per AS85049/128

QPL Qualified Standard Band Selection						
	Length		Mil Spec Part Number		Fits Diameter	
Bands	in.	mm.	Flat	Pre-Coiled	in.	mm.
Standard Band	14.25	361.95	M85049/128-3	M85049/128-4	1.8	45.7

Cable Pull Strength for Standard QPL Qualified Bands							
Name	Material Type	Band Width		Band Thickness		Calibration Setting	Cable Pull Strength
		In	mm	In	mm		
Standard	300 SS	0.240	6.10	.020	.51	150 ±5 lbs	per AS85049/128

Band-Master ATS®

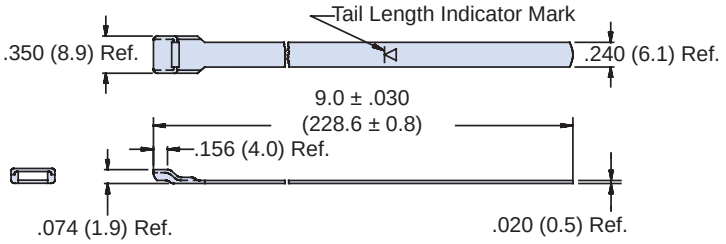
Standard banding tools and bands

SPACE GRADE
NASA
ESA, JAXA
SCREENED

STANDARD BANDS

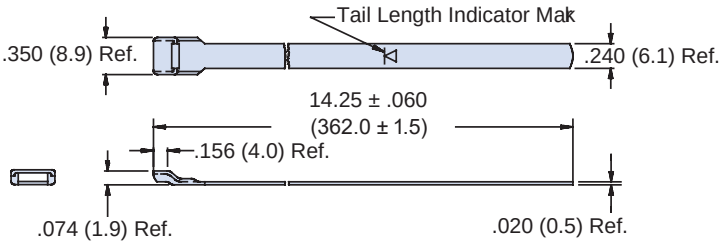
Short Flat 601-005
Short Precoiled 601-006

Standard bands are precision constructed of 300 Series SST passivate IAW AMS 2700 . Short standard bands are 9.00 inches (228.6) in length and designed for use with the Band-Master ATS® 601-100 manual banding tool or the 601-106 pneumatic banding tool. Bands should always be double wrapped and will accommodate diameters up to approximately 1.0 inches (25.4).



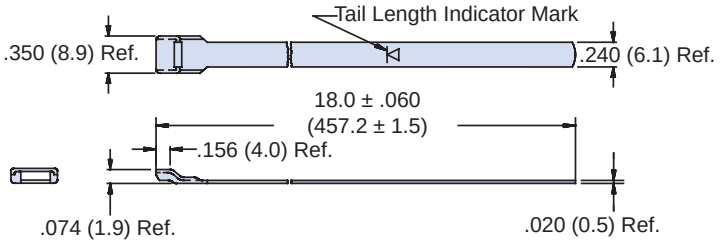
Medium Flat 601-040
Medium Precoiled 601-041

Standard bands are precision constructed of 300 Series SST passivate IAW AMS 2700. Medium standard bands are 14.25 inches (361.95) in length and designed for use with the Band-Master ATS® 601-100 manual banding tool or the 601-106 pneumatic banding tool. Bands should always be double wrapped and will accommodate diameters up to approximately 1.8 inches (45.7).



Long Flat 601-049
Long Precoiled 601-050

Standard bands are precision constructed of 300 Series SST passivate IAW AMS 2700. Long standard bands are 18.0 inches (457.2) in length and designed for use with the Band-Master ATS® 601-100 manual banding tool or the 601-106 pneumatic banding tool. Bands should always be double wrapped and will accommodate diameters up to approximately 2.5 inches (63.5).



Dimensions in Inches (millimeters) are subject to change without notice.

Band-Master ATS®

Micro banding tools and bands

MICRO BANDING TOOL

Color-coded tool handle:

= Micro; Blue

The 601-101 Band-Master ATS® Micro Tool with Counter for Micro Bands

Weighs approximately 1.20 lbs., and is designed for micro .120" width clamping bands in a tension range from 50 to 85 lbs. Calibrate at 80 lbs ±3 lbs. for most shield terminations. Tool and band should never be lubricated.

The 600-061 QPL Qualified (M81306/1B) Micro Banding Tool without Counter

Weighs 1.11 and is designed for micro .120" width clamping bands in a tension range from 60 to 85 lbs. Calibrate at 80 lbs ±5 lbs. for most shield terminations. Tool and band should never be lubricated (not shown).

	Band-Master ATS® Micro Band Selection					
	Length		Part Number		Fits Diameter	
Bands	in.	mm.	Flat	Pre-Coiled	in.	mm.
Short Micro	5.0	127.0	601-024	601-025	0.5	12.7
Medium Micro	8.125	206.4	601-060	601-061	.88	22.4
Long Micro	14.25	362.0	601-064	601-065	1.8	45.7

Cable Pull Strength for Band-Master ATS® Micro Bands							
Name	Material Type	Band Width		Band Thickness		Calibration Setting	Cable Pull Strength
		In	mm	In	mm		
Micro	300 SS	0.120	3.05	.015	.38	80 ±5 lbs	per AS85049/128

	QPL Qualified Micro Band Selection					
	Length		Part Number		Fits Diameter	
Bands	in.	mm.	Flat	Pre-Coiled	in.	mm.
Standard Micro	8.125	206.4	M85049/128-7	M85049/128-8	.88	22.4

Cable Pull Strength for Micro QPL Qualified Bands							
Name	Material Type	Band Width		Band Thickness		Calibration Setting	Cable Pull Strength
		In	mm	In	mm		
Micro	300 SS	0.120	3.05	.015	.38	80 ±5 lbs	per AS85049/128

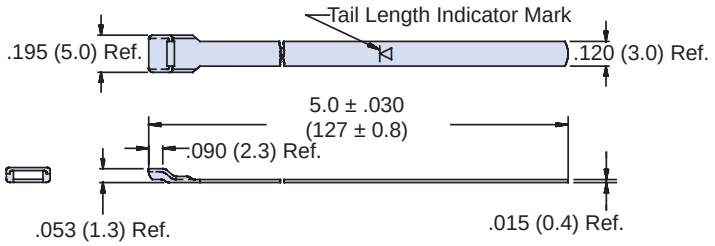
Band-Master ATS®

Micro banding tools and bands

MICRO BANDS

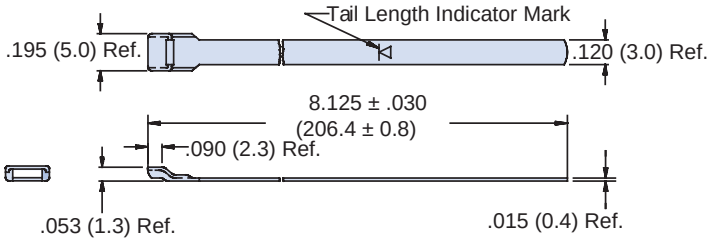
Short Flat 601-024
Short Precoiled 601-025

Micro Bands are precision constructed of 300 Series SST passivate IAW AMS 2700. Short Micro Bands are 5.00 inches (127) in length and designed for use with the Band-Master ATS® 601-101 hand banding tool or the 601-107 pneumatic banding tool. Bands should always be double wrapped and will accommodate diameters up to approximately .5 inches (12.7).



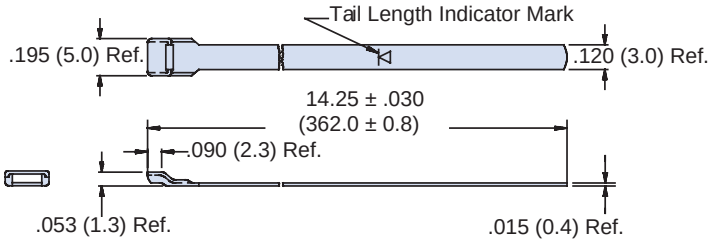
Medium Flat 601-060
Medium Precoiled 601-061

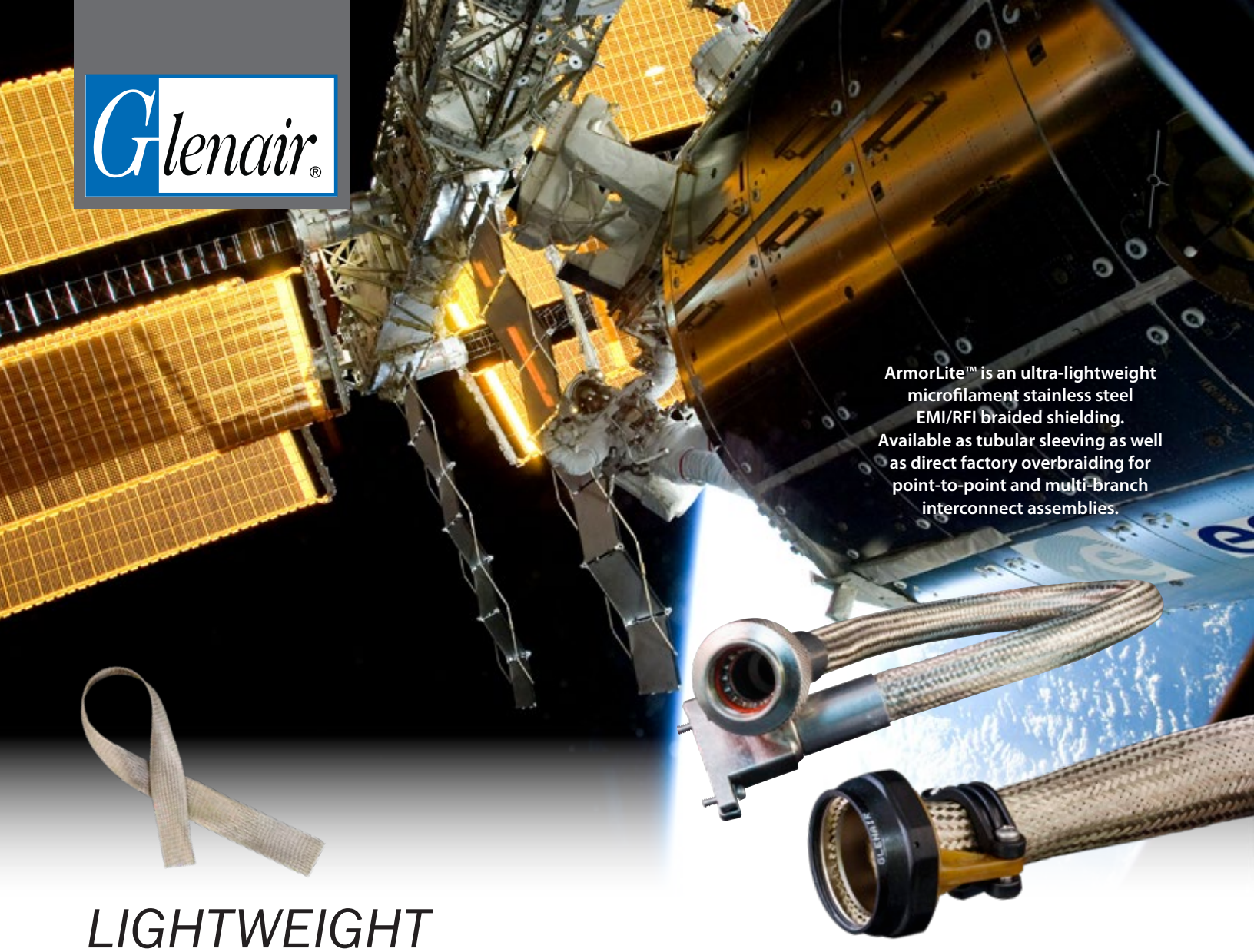
Micro Bands are precision constructed of 300 Series SST passivate IAW AMS 2700. Medium Micro Bands are 8.125 inches (206.4) in length and designed for use with the Band-Master ATS® 601-101 hand banding tool or the 601-107 pneumatic banding tool. Bands should always be double wrapped and will accommodate diameters up to approximately .88 inches (22.4).



Long Flat 601-064
Long Precoiled 601-065

Micro Bands are precision constructed of 300 Series SST passivate IAW AMS 2700. Long Micro Bands are 14.25 inches (362.0) in length and designed for use with the Band-Master ATS® 601-101 hand banding tool or the 601-107 pneumatic banding tool. Bands should always be double wrapped and will accommodate diameters up to approximately 1.88 inches (47.8).





ArmorLite™ is an ultra-lightweight microfilament stainless steel EMI/RFI braided shielding. Available as tubular sleeving as well as direct factory overbraiding for point-to-point and multi-branch interconnect assemblies.

LIGHTWEIGHT

ARMORLITE™

Microfilament nickel-clad expandable stainless steel EMI/RFI braided shielding

Save weight and money every time you fly! All-Up-Weight (AUW) has met its match: ArmorLite™ microfilament stainless steel braid saves pounds compared to standard QQ-B-575/A-A-59569 EMI/RFI shielding. ArmorLite™ is an expandable, flexible, high-strength, conductive stainless steel microfilament braid material designed for use as EMI/RFI shielding in high-performance wire interconnect systems. The principal benefit of ArmorLite™ is its extreme light weight compared to conventional nickel/copper shielding. By way of comparison, 100 feet of 5/8 inch ArmorLite™ is more than four pounds lighter than standard 575 A-A-59569 shielding. Plus, ArmorLite™ offers superior temperature tolerance compared to other lightweight tubular braided shielding including microfilament composite technologies.

- **Ultra-lightweight EMI/RFI braided sleeving for high-temperature applications -80°C to +260°C**
- **Microfilament stainless steel: *70% lighter* than NiCu A-A-59569/QQB575**
- **Outstanding EMI/RFI shielding and conductivity**
- **Aerospace environment qualified**
- **Superior flexibility and "windowing" resistance: 90 to 95% optical coverage**
- **70,000 psi (min.) tensile strength**
- **Best performing metallic braid during lightning tests (IAW ANSI/EIA-364-75-1997 Waveform 5B)**

LIGHTWEIGHT, FLEXIBLE

ArmorLite™ Microfilament Braid for EMI/RFI Shielding Applications

SPACE GRADE
NASA
ESA, JAXA
SCREENED

DESCRIPTION	REQUIREMENT	PROCEDURE	REPORT
Altitude test 27,000 ft (5 PSIA nom.)	2.5% min.	RTCA DO-160F, Table 4-1, Table 4-2 Category C temp. spec	ARM-103
Operating Temperature	-80°C to +260°C	(85% Shielding effectiveness 1000 hours)	ARM-103
Braid Resistivity test, Pre and Post	Test pre/post–5 cycles–minimal disparity per spec.	EIA-364-32D IAW AS85049	ARM-110/1
Surface Transfer Impedance	Transfer Impedance (10.0 kHz ~ 1.0 GHz)	IEC 62153-4-3	GT-18-026
Shield Effectiveness test, Pre and Post	Screening Attenuation (0 ~ 4.00 GHz)	IEC 62153-4-4	GT-18-026
Tensile/ Pull Strength	220 lbs. (min.). No anomalies within 8% - 10% of pre test for variable sizes	Glenair ATP- 183. 0 lbs. to 90 lbs, to 150 lbs, to 220lbs @ speed of 0.25 inches/min	ARM-105
Specific Gravity Test	8.2 (max) per ISO-1183	ASTM A580 (ref 316L Stainless Steel)	ARM-109
Lightning Current Test	Glenair Qual. Test Plan 191/ DC resistance/ voltage criteria per DO-160F Level for 3 sizes up to 30Ka.	ANSI/EIA-364-75-1977 Wave Form 5B SAE/ARP5416 Section 6.3 Waveform 1, 3 (1, 10MHz) and 5A	ARM-110 ARM-112
Vertical Flammability	Self extinguishing ≤ 2 sec. Burn length 0.1 inch. max. Dripping 0.0 seconds.	14 CFR part 25.853 (a) AMdT25-116 Appendix F Part I (a) (1) (ii)	ARM-101
Mass Loss and Collected Volatile Condensable Materials	Total Mass Loss (TML) ≤1.0% Collected Volatile Condensable Matl.(CVCM) ≤.1%	ASTM E-595	ARM-102
Salt Spray Test	DC Resistance IAW AS85049 .5 milliohm. No evidence of base metal on braid	ASTM B117-09 Sodium Chloride 5% 500 Hrs	ARM-100
Vibration Resistance	EAI Test Report 33247. DO160 section 8 Cat. R Vib. Curves E1	DO-160F RTCA/DO-160F, Section 9, Fig. 8-4. Curve E1. - 3 sizes – 3 hours on each axis.	ARM-111
Thermal Shock Cycling test and Resistivity	No adverse effects in visual inspection or resistance after 50 cycles	EIA-364-32D, Table 3 Test condition V -65°C to +175°C	ARM-113
Abrasion and Plating test	DC Resistance IAW AS 85049. Glenair internal QTR-003	ATP 180 20 continuous @ 6 cycles/min. over 3 arms with .030 radiused edges	ARM-107
Fluid Immersion Test	Material compatibility – see table below	Customer/AS4373D method 601 Mod	ARM-106
Flex Test	2 Cycles: starting 0° over vertical ctr. line across to 180° cycle. Total cycles of 25633	Glenair ATP 179	ARM-112

Test Fluid	Test Temp °C	Test Temp °F	Immersion Time(h)	Requirement	Procedure
MIL-L-23699, Lubricating Oil ,Aircraft Turbine Engine, Synthetic Base	48-50	118-122	20	No fraying, DCresistance within limits (AS85049 paragraph 4.6.3)	SAE AS1241 Table 15/Mil-Std 810F Method 504 (modified), for all Substances. Additional conformance to Test Criteria AS4373D method 601 Mod
MIL-H-5606 (Inactive for New Design), Hydraulic Fluid, Petroleum Base, Aircraft Missile, and Ordnance	48-50	118-122	20		
TTI-I-735, Solvent, Isopropyl Alcohol	20-25	68-77	168		
ASTM D 1153, Methyl Isobutyl Ketone (For use in organic coatings)	20-25	68-77	168		
MIL-DTL-5624 , Turbine Fuel, Aviation, Grade JP-4 either or MIL-T-83133, JP-8	20-25	68-77	168		
SAE AMS1424, Anti-Icing and Deicing-Defrosting Fluid, undiluted	48-50	118-122	20		
SAE AMS1424, Anti-Icing and Deicing-Defrosting Fluid, diluted 60/40 (fluid/water) ratio. Supersedes Coolanol 25 Item Q	48-50	118-122	20		
MIL-C-43616, Cleaning Compound, Aircraft Surface	48-50	118-122	20		
SAE AS 1241 , Fire Resistant Hydraulic Fluid for Aircraft	48-50	118-122	20		
MIL-L-7808, Lubricating Oil, Aircraft Turbine Engine, Synthetic Base	118-121	244-250	30		
MIL-C-87937, Cleaning Compound, Aircraft Surface, Alkaline, undiluted	63-68	145-154	20		
MIL-C-87937, Cleaning Compound, Aircraft Surface, Alkaline Waterbase, diluted 25175 (fluid/water) ratio	63-68	145-154	20		
TT-S-735, Standard Test Fluids; Hydrocarbon, Type I	20-25	68-77	168		
TT-S-735, Standard Test Fluids; Hydrocarbon, Type II	20-25	68-77	168		
TT-S-735, Standard Test Fluids; Hydrocarbon, Type III	20-25	68-77	168		
TT-S-735, Standard Test Fluids; Hydrocarbon, Type VII	20-25	68-77	168		
MIL-PRF-87252, Coolant Fluid, Hydrolytically Stable, Dielectric	20-25	68-77	168		

LIGHTWEIGHT, FLEXIBLE

ArmorLite™ Microfilament Braid for EMI/RFI Shielding Applications

Aircraft utilization study

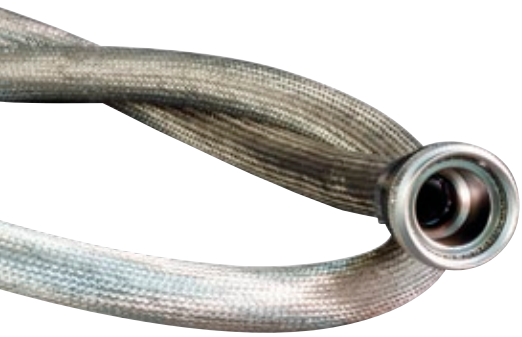
ARMORLITE™ AIRCRAFT UTILIZATION ANALYSIS

Comparison of ArmorLite® lightweight microfilament braid to standard A-A-59569 Ni/Cu braid

ArmorLite™ lightweight EMI/RFI braided shielding is ideally suited for weight reduction efforts in Electrical Wire Interconnect Systems in aerospace applications

Length and Weight of NiCu Braid in Typical Commercial Aircraft			
Diameter (in)	Weight (Lb/ft)	Length (in)	weight (Lb)
0 - 0.25	0.02	12564.8	21.08
0.25 - 0.5	0.05	5259.3	21.17
0.5 - 0.75	0.07	1212.6	7.12
0.75 - 1.0	0.14	1437.4	16.88
1.0 - 1.5	0.18	467	7.05
		Total weight	**73.3**

Weight Savings Using ArmorLite™ (Equivalent Lengths)				
Diameter (in)	Weight (Lb/ft)	Length (in)	Length in feet	weight (Lb)
0 - 0.25	.00507	12564.8	1047.07	5.309
0.25 - 0.5	.0097	5259.3	438.28	4.251
0.5 - 0.75	.0178	1212.6	101.05	1.737
0.75 - 1.0	.0256	1437.4	119.78	3.063
1.0 - 1.5	.0368	467	38.92	1.434
		Total weight		**15.794**



Using ArmorLite™ in place of standard nickel-copper braid saves 54.6 pounds per system—up to 78% weight savings!

Aircraft Zone Typical Braid Utilization (length in inches)								
L Wing	R Wing	Fwd Belly	Aft Belly	HYD Bay	Aft Barrel	Tail	V/H Stab	Totals
1852.2	1852.2	0	2811.4	168.2	2015.2	2480.6	1385	12564.8
434.8	434.8	511.6	1034.6	257.4	506.2	958.2	1121.7	5259.3
0	0	260.9	223	0	184.2	392.4	152.1	1212.6
0	0	77.2	0	0	1198	162.2	0	1437.4
0	0	0	0	0	446	21	0	467

ArmorLite™ Microfilament Braid

103-051 100% ArmorLite
EMI/RFI microfilament stainless steel braided shielding

SPACE GRADE
NASA
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SCREENED

103-051 ARMORLITE™ LIGHTWEIGHT EMI/RFI MICROFILAMENT STAINLESS STEEL BRAIDED SHIELDING

How To Order				
Sample Part Number	**103**	**-051**	**-024**	**S**
Product Code	Lightweight Braid Series			
ArmorLite™	**-051** = 100% ArmorLite™ Nickel-Clad Stainless Steel			
Braid Diameter Dash Number	See Table			
Silver Clad Option	**S** = silver clad **Omit** for standard nickel clad			

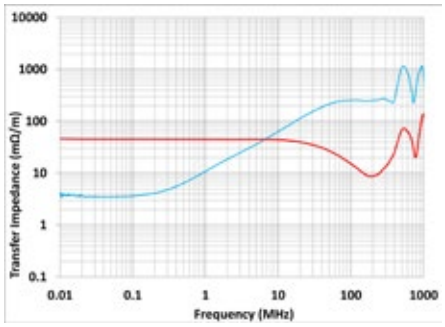
ArmorLite™ -051 vs. nickel-plated copper braid			
Braid Dia.	ArmorLite™ 103-051 grams per foot (approx.)	Nickel-Copper 100-003 grams per foot (approx.)	% Weight Savings/ Foot
.031	.5	.9	44%
.062	1.2	1.9	37%
.125	1.6	4.8	67%
.250	2.3	16.1	86%
.375	3.0	18.5	84%
.500	4.6	22.3	79%
.625	5.0	27.7	82%
.750	6.0	34.3	83%
1.000	11.9	35.0	66%
1.250	14.5	44.0	67%
1.500	17.9	51.0	65%
2.000	23.6	60.0	61%

Dash Number - Diameter, Wire Bundle and Weight					
Dash No.	Nominal I.D. (ref.)	Wire Bundle Range (ref.)	Approx. Grams/Foot Nickel Clad	Approx. Grams/Foot Silver Clad	Approx. Milliohms/ Meter
-001	.031 (.8)	.016 (.4) .047 (1.2)	.52	.53	355
-002	.062 (1.6)	.040 (1.0) .075 (1.9)	1.19	1.23	129
-004	.125 (3.2)	.093 (2.4) .140 (3.5)	1.55	1.60	109
-008	.250 (6.4)	.125 (3.2) .312 (7.9)	2.28	2.35	65
-012	.375 (9.5)	.250 (6.4) .406 (10.3)	3.00	3.10	49
-016	.500 (12.7)	.375 (9.5) .560 (14.2)	4.56	4.70	33
-020	.625 (15.9)	.375 (9.5) .700 (17.8)	4.97	5.13	32
-024	.750 (19.1)	.500 (12.7) .800 (20.3)	6.00	6.19	25
-032	1.000 (25.4)	.780 (19.8) 1.100 (27.9)	11.9	12.3	13
-040	1.250 (31.8)	.938 (23.8) 1.312 (33.3)	14.5	15.0	11.3
-048	1.500 (38.1)	1.187 (30.1) 1.590 (40.4)	17.9	18.5	9
-064	2.000 (50.8)	1.312 (33.3) 2.090 (53.1)	23.6	24.4	5

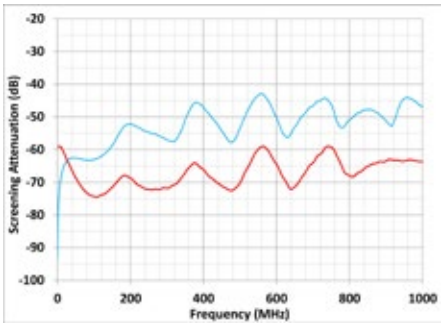
ARMORLITE™

- **70+% weight savings over NiCu braid**
- **Outstanding EMI/RFI shielding and conductivity**
- **Broader temperature range: -80°C to +260°C**
- **Highly corrosion resistant**
- **Superior flexibility and "windowing" resistance**

Transfer Impedance Comparison (Z_T) Size 16



Screening Attenuation Comparison (A_S) Size 16



103-051-016 ArmorLite™ 100-003A500 NiCu Tested per IEC 62153-4-3Ed2

NOTES

1. Material - ArmorLite™ nickel-clad 316L stainless steel. ArmorLite™ is a trademark of Glenair, Inc.
2. Specify length on purchase order. No minimums!

ArmorLite™ Microfilament Braid

103-052 75% ArmorLite, 25% Nickel/Copper EMI/RFI microfilament stainless steel braided shielding

103-052 ARMORLITE™ LIGHTWEIGHT EMI/RFI MICROFILAMENT STAINLESS STEEL / NICKEL COPPER BRAIDED SHIELDING

How To Order				
Sample Part Number	**103**	**-052**	**-024**	**S**
Product Code	Lightweight Braid Series			
ArmorLite™	**-052** = 75% ArmorLite™ / 25% Nickel-Copper			
Braid Diameter Dash Number	See Table			
Silver Clad Option	**S** = 75% ArmorLite / 25% silver-plated copper **Omit** for standard nickel clad			

ArmorLite™ -052 vs. nickel-plated copper braid

Braid Dia.	ArmorLite™ 103-052 grams per foot (approx.)	Nickel-Copper 100-003 grams per foot (approx.)	% Weight Savings/ Foot
.062	1.6	1.9	16%
.125	1.8	4.8	63%
.250	2.8	16.1	83%
.375	3.5	18.5	81%
.500	5.4	22.3	76%
.625	5.7	27.7	79%
.750	7.5	34.3	78%
1.000	13.1	35.0	63%
1.250	15.8	44.0	65%
1.500	19.7	51.0	61%
2.000	24.4	60.0	59%

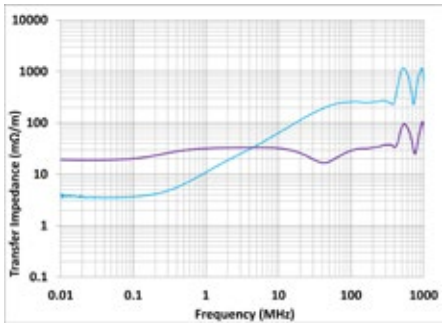
Dash Number - Diameter, Wire Bundle and Weight

Dash No.	Nominal I.D. (ref.)	Wire Bundle Range (ref.)	Approx. Grams/Foot
-002	.062 (1.6)	.040 (1.0) – .075 (1.9)	1.6
-004	.125 (3.2)	.093 (2.4) – .140 (3.5)	1.8
-008	.250 (6.4)	.125 (3.2) – .312 (7.9)	2.8
-012	.375 (9.5)	.250 (6.4) – .406 (10.3)	3.5
-016	.500 (12.7)	.375 (9.5) – .560 (14.2)	5.4
-020	.625 (15.9)	.375 (9.5) – .700 (17.8)	5.7
-024	.750 (19.1)	.500 (12.7) – .800 (20.3)	7.5
-032	1.000 (25.4)	.780 (19.8) – 1.100 (27.9)	13.1
-040	1.250 (31.8)	.938 (23.8) – 1.312 (33.3)	15.8
-048	1.500 (38.1)	1.187 (30.1) – 1.590 (40.4)	19.7
-064	2.000 (50.8)	1.312 (33.3) – 2.090 (53.1)	24.4

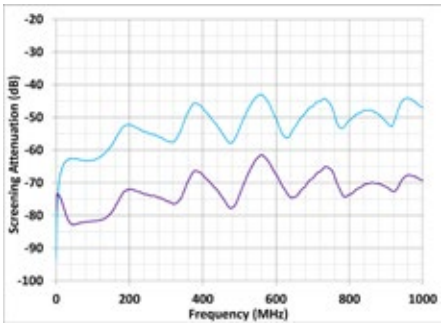
ARMORLITE™

- **70+% weight savings over NiCu braid**
- **Outstanding EMI/RFI shielding and conductivity**
- **Broader temperature range: -80°C to +200°C**
- **Highly corrosion resistant**
- **Superior flexibility and "windowing" resistance**

Transfer Impedance Comparison (Z_T) Size 16



Screening Attenuation Comparison (A_S) Size 16



103-052-016 75% ArmorLite / 25% NiCu — 100-003A500 NiCu Tested per IEC 62153-4-3Ed2

NOTES

1. Material - 75% ArmorLite™ nickel-clad 316L stainless steel / 25% nickel plated copper.
   S Option - 75% ArmorLite™ nickel-clad 316L stainless steel / 25% silver plated copper.
   ArmorLite™ is a trademark of Glenair, Inc.
2. Specify length on purchase order. No minimums!

ArmorLite™ Microfilament Braid

103-071 50% ArmorLite, 50% Nickel/Copper EMI/RFI microfilament stainless steel braided shielding

SPACE GRADE
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103-071 ARMORLITE™ LIGHTWEIGHT EMI/RFI MICROFILAMENT STAINLESS STEEL / NICKEL COPPER BRAIDED SHIELDING

How To Order				
Sample Part Number	**103**	**-071**	**-024**	**S**
Product Code	Lightweight Braid Series			
ArmorLite™	**-071** = 50% ArmorLite™ / 50% Nickel-Copper			
Braid Diameter Dash Number	See Table			
Silver Clad Option	**S** = 50% ArmorLite / 50% silver-plated copper **Omit** for standard nickel clad			

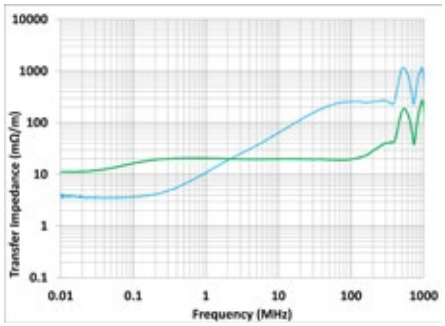
ArmorLite™ -071 vs. nickel-plated copper braid			
Braid Dia.	ArmorLite™ 103-071 grams per foot (approx.)	Nickel-Copper 100-003 grams per foot (approx.)	% Weight Savings/ Foot
.062	2.1	1.9	16%
.109	2.4	3.7	35%
.125	2.5	4.8	63%
.250	3.6	16.1	83%
.375	5.1	18.5	81%
.500	7.5	22.3	76%
.625	7.7	27.7	79%
.750	10.0	34.3	78%
1.000	15.5	35.0	63%
1.250	16.8	44.0	65%
1.500	27.9	51.0	61%
2.000	30.2	60.0	59%

Dash Number - Diameter, Wire Bundle and Weight			
Dash No.	Nominal I.D. (ref.)	Wire Bundle Range (ref.)	Approx. Grams/Foot
-001	.031 (0.8)	.025 (0.6) – .062 (1.6)	1.8
-002	.062 (1.6)	.040 (1.0) – .075 (1.9)	2.1
-003	.109 (2.8)	.075 (1.9) – .125 (3.2)	2.4
-004	.125 (3.2)	.093 (2.4) – .140 (3.5)	2.5
-008	.250 (6.4)	.125 (3.2) – .312 (7.9)	3.6
-012	.375 (9.5)	.250 (6.4) – .406 (10.3)	5.1
-016	.500 (12.7)	.375 (9.5) – .560 (14.2)	7.5
-020	.625 (15.9)	.375 (9.5) – .700 (17.8)	7.7
-024	.750 (19.1)	.500 (12.7) – .800 (20.3)	10.0
-032	1.000 (25.4)	.780 (19.8) – 1.100 (27.9)	15.5
-040	1.250 (31.8)	.938 (23.8) – 1.312 (33.3)	16.8
-048	1.500 (38.1)	1.187 (30.1) – 1.590 (40.4)	27.9
-064	2.000 (50.8)	1.312 (33.3) – 2.090 (53.1)	30.2

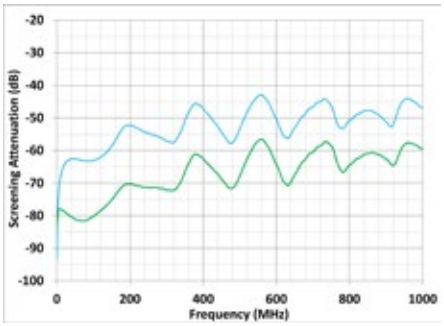
ARMORLITE™

- **70+% weight savings over NiCu braid**
- **Outstanding EMI/RFI shielding and conductivity**
- **Broad temperature range: -80°C to +200°C**
- **Highly corrosion resistant**
- **Superior flexibility and "windowing" resistance**

Transfer Impedance Comparison (Z_T) Size 16



Screening Attenuation Comparison (A_S) Size 16



103-071-016 50% ArmorLite / 50% NiCu — 100-003A500 NiCu — Tested per IEC 62153-4-3Ed2

NOTES

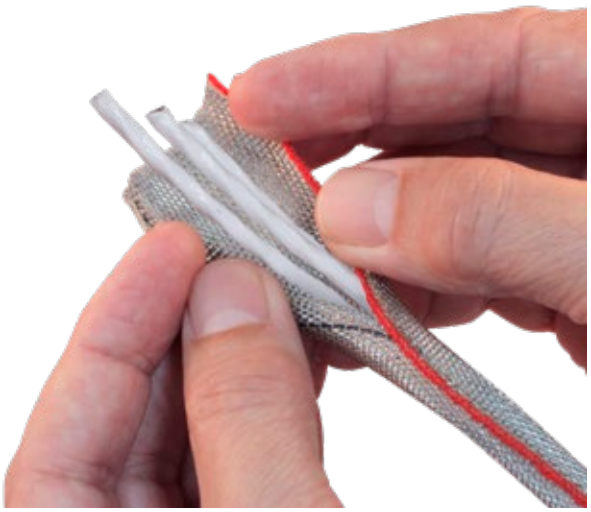
1. Material - 50% ArmorLite™ nickel-clad 316L stainless steel / 50% nickel plated copper. S Option - 50% ArmorLite™ nickel-clad 316L stainless steel / 50% silver plated copper. ArmorLite™ is a trademark of Glenair, Inc.
2. Specify length on purchase order. No minimums!

WITH ARMORLITE™ TECHNOLOGY

MasterWrap™ flexible, lightweight wraparound EMI/RFI shielding and abrasion protection

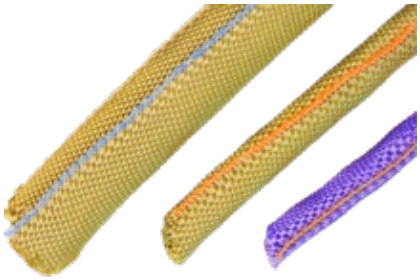
for spot EMI/RFI shielding coverage and repair of wire harnesses

MasterWrap™



- **Up to 70% weight reduction compared to standard metallic EMI shielding**
- **Replaces harder-to-install tubular EMI/RFI sleeving**
- **Fast and easy side-entry installation and removal**
- **Reduces windowing and coverage gaps**
- **Superior flexibility, durability and repairability**
- **Temperature tolerant from -65°C to 200°C**
- **High-frequency EMI shielding performance comparable to standard metallic and lightweight tubular braid**
- **Outstanding abrasion and mechanical protection**
- **Halogen-free and RoHS compliant**
- **500 hour salt spray corrosion resistance**
- **50,000 cycle 90°–120° bend flex tested**
- **Outstanding caustic chemical and corrosive fluid resistance**

Tubular braided sleeving meets the broad range of EMC shielding and mechanical protection requirements of aircraft harness assemblies. But the need to apply conductive shielding materials over installed aircraft wire and cable bundles requires new technology. Legacy self-wrapping cable braid has long been available for EMI/RFI applications and abrasion protection, albeit with poor performance due to its heavy weight, inflexibility, and "windowing," which results in poor shielding performance. MasterWrap™, a lightweight, easy-to-install, side-entry, self-wrapping shielding solution —incorporating Glenair microfilament ArmorLite™ and composite thermoplastic PEEK fibers—solves these problems and more. MasterWrap™ is ideally suited for both long-run wire harness protection as well as spot coverage and maintenance of EMC cable applications—all with outstanding weight reduction and ease-of-assembly. MasterWrap™ is qualified for use at major aircraft manufacturers for both long cable runs and spot coverage and repairs.



MATERIAL CONSTRUCTION AND HANDLING PERFORMANCE

Flexible material eliminates kinking and windowing · Spring members ensure shielding stays tight to wire bundle

Ultra-lightweight microfilament stainless steel core, plated with conductive nickel for outstanding shielding performance

Interwoven with high-temperature PEEK composite thermoplastic spring members that ensure up to 95% optical coverage

- Material design provides uniform surface with limited interference to structures and clamps
- Provides optimum surface coverage and adherence to wire bundle without buckling during both straight and angled routing
- MasterWrap delivers increased abrasion protection with additional axial edge strength members compared to standard tubular braided shielding
- Reduces kinking and windowing compared to full metal braid solutions for excellent shielding performance

WITH ARMORLITE™ TECHNOLOGY

MasterWrap™ flexible, lightweight wraparound EMI/RFI shielding and abrasion protection

for spot EMI/RFI shielding coverage and repair of wire harnesses

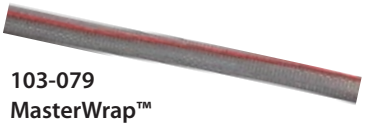
SPACE GRADE NASA ESA, JAXA SCREENED

HERE'S WHAT YOU NEED TO KNOW ABOUT WEIGHT

Weight of standard metallic tubular braided cable shielding		
EMI Braided Shielding Type (measured samples all 1/2" diameter)	Weight g/ft	Weight g/m
Glenair nickel-clad copper braid	21.6	70.9
Raychem RAY-103-12.5 nickel-clad copper braid	21.9	72.0
Weight of lightweight tubular (LWB) braided cable shielding		
AmberStrand® 100%	3.7	12.1
AmberStrand® 75% / NiCu 25%	4.9	16.1
ArmorLite™ 100%	4.4	14.4
ArmorLite™ 75% / NiCu 25%	5.4	17.7
Raychem INSTALITE	13.4	44.0
Weight of side-entry self-wrapping braided cable shielding		
MasterWrap™	6.2	20.3
Federal Mogul ROUNDIT® EMI FMJ	18.0	59
Federal Mogul ROUNDIT® EMI C27 XWS	23.5	77

100-003
tubular metal braid ASTM B355 Class 4 OFHC nickel-plated copper

103-051
ArmorLite™ microfilament nickel-clad stainless steel



103-079
MasterWrap™ side-entry shield braid

Mechanical and Environmental Performance Summary		
Vibration	No evidence of wear or visible defect	DO-160G Cat S and H
Abrasion	No evidence of wear, visible defect or electrical degradation	EN-3475-511:2002
High Temperature Exposure	168 hours at 200°C; no visual or electrical degradation	EN 6059-302 part 302
Rapid Change of Temperature	10 hour hot and cold cycling; no evidence of wear or visible defect	EN 6059-308 part 308
Vertical Flammability	Pass	14 CFR part 25.853
Fluid Immersion Testing	No visual or electrical degradation	DO-160G
Bending Properties	25000 cycles; no breakage, no plating delamination	EN 6059-402
Salt Fog 500 Hours	No evidence of base metal on braid	ASTM B117-03 Sodium Chloride 5%

MasterWrap is compatible with most aerospace industry fluids. Consult factory for specifics.

WHAT YOU NEED TO KNOW ABOUT EMI/RFI SHIELDING PERFORMANCE

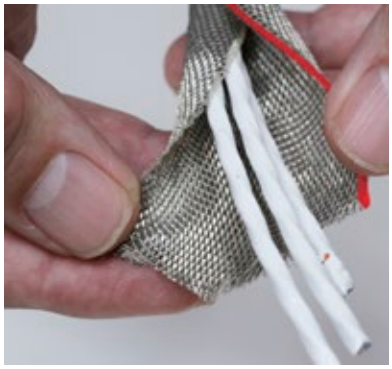
	NiCu	ArmorLite™	Amberstrand®	MasterWrap™
TRANSFER IMPEDANCE (Per IEC 62153-4) (Max values for 1/2 inch diameter shields)				
FREQUENCY				
10 KHz	5 mΩ/m	50 mΩ/m	60 mΩ/m	40 mΩ/m
100 KHz	5 mΩ/m	50 mΩ/m	60 mΩ/m	40 mΩ/m
1 MHz	12 mΩ/m	50 mΩ/m	60 mΩ/m	40 mΩ/m
10 MHz	80 mΩ/m	50 mΩ/m	80 mΩ/m	40 mΩ/m
100 MHz	130 mΩ/m	30 mΩ/m	110 mΩ/m	80 mΩ/m
SHIELDING ATTENUATION (Per IEC 62153-4) (Min values for 1/2 inch diameter shields)				
FREQUENCY				
1 GHz	38 dB	55 dB	48 dB	40 dB
3 GHz	40 dB	60 dB	55 dB	35 dB
5 GHz	44 dB	60 dB	60 dB	45 dB
8 GHz	40 dB	50 dB	60 dB	40 dB
WEIGHT	**70.9 g/m**	**14.4 g/m**	**12.1 g/m**	**20.3 g/m**

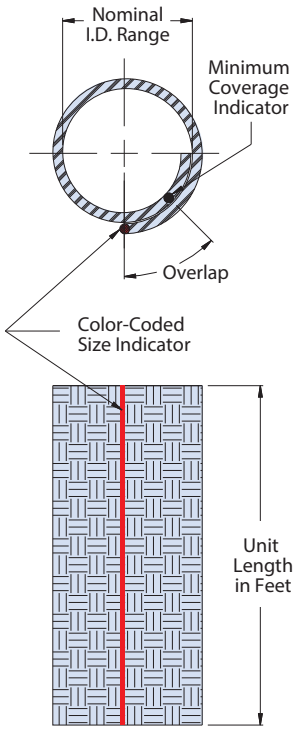
The table at left is a useful summary of MasterWrap™ shielding performance compared to NiCu and lightweight braid. Transfer impedance and shielding attenuation data is supplied for 1/2" diameter test samples. At high frequencies, both LWB and MasterWrap™ provide comparable and even superior performance to nickel-copper due to reduced windowing and superior optical coverage with significant reduction in weight. Further improvements in high-frequency shielding attenuation can be achieved using conductive tape wraps and/or via hybrid blends of LWB and NiCu.

MasterWrap™ ArmorLite: flexible, lightweight wraparound EMI/RFI shielding

for long runs and spot coverage

MASTERWRAP ARMORLITE: DIMENSIONAL INFORMATION • HOW TO ORDER





How To Order		
Sample Part Number	**103-079**	**-024**
Basic No.	MasterWrap™ ArmorLite material	
Dash No.	See Table I	

Table I

Dash No	Nominal I.D. (Ref.)		Ref. Wire Bundle Range Nominal		Approx. Weight Grams/Ft.	Approx. Milliohms / Meter	Min. Pull Strength (lbs)	Size Indicator color code	Quantity feet/spool
	In.	mm	In.	mm					
004	.125	3.2	.093 .170	2.4 4.3	2.1	99.8	39	Black	50–500
008	.250	6.4	.170 .300	4.3 7.6	4.0	52.2	75	Brown	50–400
012	.375	9.5	.300 .406	7.6 10.3	5.0	41.8	94	Red	50–300
016	.500	12.7	.406 .520	10.3 13.2	6.2	34.0	116	Orange	50–250
020	.625	15.9	.520 .675	13.2 17.2	8.7	24.2	158	Yellow	50–200
024	.750	19.1	.675 .825	17.2 21.0	10.6	20.0	193	Green	50–100
032	1.000	25.4	.825 1.100	21.0 27.9	12.9	16.4	237	Blue	50–100
040	1.250	31.8	.938 1.312	23.8 38.3	17.4	TBD	TBD	Violet	50–100
048	1.500	38.1	1.187 1.575	30.1 40.4	21.2	TBD	TBD	Gray	50–100
064	2.000	50.8	1.575 2.090	33.0 53.1	25.8	TBD	TBD	White	50–100

NOTES

Product ordered in 1 foot increments, packaged in boxed spools. See Table I. Lengths of 1–49 feet will be packaged in individual polybags.

Materials:

Woven mesh - ArmorLite microfilament nickel-clad 316L stainless steel; Monofilament - PEEK; Overlap tracer - high temperature DuPont™ Nomex®thread

DuPont™ and Nomex® are trademarks or registered trademarks of E.I. duPont de Nemours and Company.

AVAILABLE WIRE LOOM TOOL FOR EASY ASSEMBLY FOR ALL MASTERWRAP™ PRODUCTS

Select size based on max bundle diameter

Part Number	Max Bundle Dia.
600-180-08	3/8 in (8mm)
600-180-15	5/8 in (15mm)
600-180-20	3/4 in (20mm)
600-180-25	1 in (25 mm)
600-180-32	1 1/4 in (32mm)

Easy to use: simply gather wire bundle into the tool…

…Insert tool and wires into MasterWrap and run through

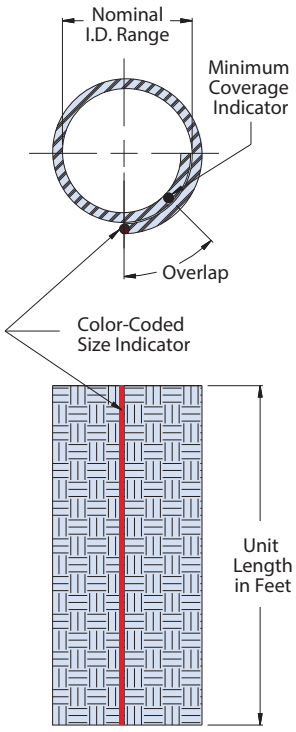
NEW MASTERWRAP™ WITH NOMEX®

103-095 (Nomex®) flexible, lightweight wraparound abrasion / thermal protection

for spot mechanical coverage and repair of wire harnesses

SPACE GRADE NASA ESA, JAXA SCREENED

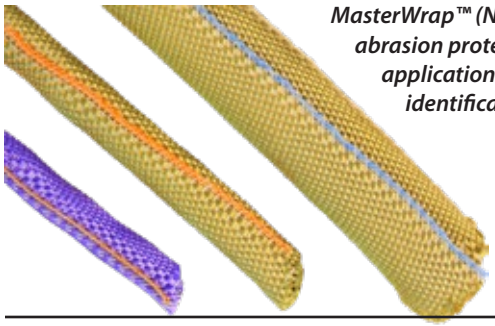
MASTERWRAP (NOMEX®): DIMENSIONAL INFORMATION • HOW TO ORDER



How To Order			
Sample Part Number	**103-095**	**-024**	**GY**
Basic No.	MasterWrap™ (Nomex®) material		
Dash No.	See Table I		
Color option	**W** = White **R** = Red **GN** = Green GY = Gray **TN** = Desert Tan **OR** = Orange Omit = for standard Black		

Table I

Dash No	Nominal I.D. (Ref.) In.	Nominal I.D. (Ref.) mm	Ref. Wire Bundle Range Nominal In.	Ref. Wire Bundle Range Nominal mm	Approx. Weight Grams/Ft.	Min. Pull Strength (lbs)	Size Indicator color code	Quantity feet/spool
004	.125	3.2	.093 .170	2.4 4.3	1.8	39	Black	50–500
008	.250	6.4	.170 .300	4.3 7.6	2.3	75	Brown	50–400
012	.375	9.5	.300 .406	7.6 10.3	3.2	94	Red	50–300
016	.500	12.7	.406 .520	10.3 13.2	3.7	116	Orange	50–250
020	.625	15.9	.520 .675	13.2 17.2	5.0	158	Yellow	50–200
024	.750	19.1	.675 .825	17.2 21.0	6.0	193	Green	50–100
032	1.000	25.4	.825 1.100	21.0 27.9	7.3	237	Blue	50–100
040	1.250	31.8	.938 1.312	23.8 38.3	10.0	TBD	Violet	50–75
048	1.500	38.1	1.187 1.590	30.1 40.4	11.0	TBD	Gray	50
064	2.000	50.8	1.812 2.090	33.0 53.1	12.2	TBD	White	50



MasterWrap™ (Nomex®) is the ideal solution for mechanical abrasion protection of wire bundle harnessing in aircraft applications. Available color selections allow for easy identification and labeling of wire circuitry.

NOTES

Product ordered in 1 foot increments, packaged in boxed spools. See Table I. Lengths of 1–49 feet will be packaged in individual polybags.

Materials:

Woven mesh - high temperature DuPont™ Nomex®; Monofilament - PEEK; Overlap tracer - high temperature DuPont™ Nomex®thread

DuPont™ and Nomex® are trademarks or registered trademarks of E.I. duPont de Nemours and Company.

ArmorLite™ mesh tape: flexible, lightweight woven solution for spot EMI coverage and repairs

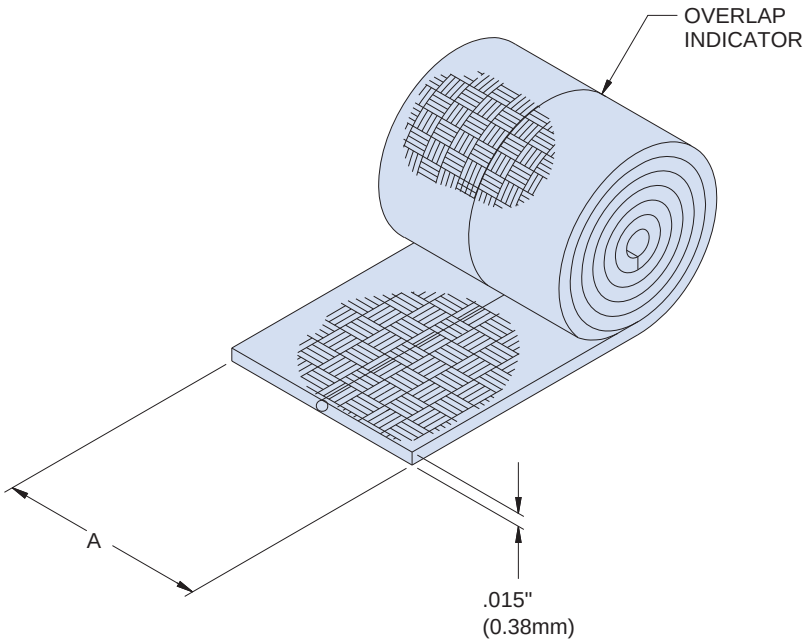
103-058 ArmorLite™ mesh tape (non-adhesive)

103-058 ARMORLITE LIGHTWEIGHT SHIELDING TAPE FOR 360° EMI SPOT COVERAGE AND REPAIR

How To Order			
Sample Part Number		**103-058**	**-1**
Basic No.	ArmorLite™ tape		
Dash No.	**1** = .50" wide tape **2** = 1.00" wide tape **3** = 1.50" wide tape (see Table I for specifications)		

Table I

Dash No.	Nominal Width 'A' Dim.	Approx. Weight (grams/ft.)	Milliohms per meter ref.	Minimum pull strength (lbs) ref.
-1	.50" (12.7mm)	2.1	99.8	39
-2	1.00" (25.4mm)	4.0	52.2	75
-3	1.50" (38.1mm)	6.1	TBD	120



NOTES

1. Order in 1 foot increments. Standard packaging on spools in 50 ft. lengths. Orders of 1–49 ft. will be packaged in individual polybags.

Material:

Woven mesh - ArmorLite™ microfilament (nickel clad 316L stainless steel); Overlap tracer - high temperature DuPont™ Nomex® thread; Monofilament - PEEK

DuPont™ and Nomex® are trademarks or registered trademarks of E.I. duPont de Nemours and Company.

Mesh tape, Nomex®: flexible, lightweight woven solution for spot mechanical/abrasion protection

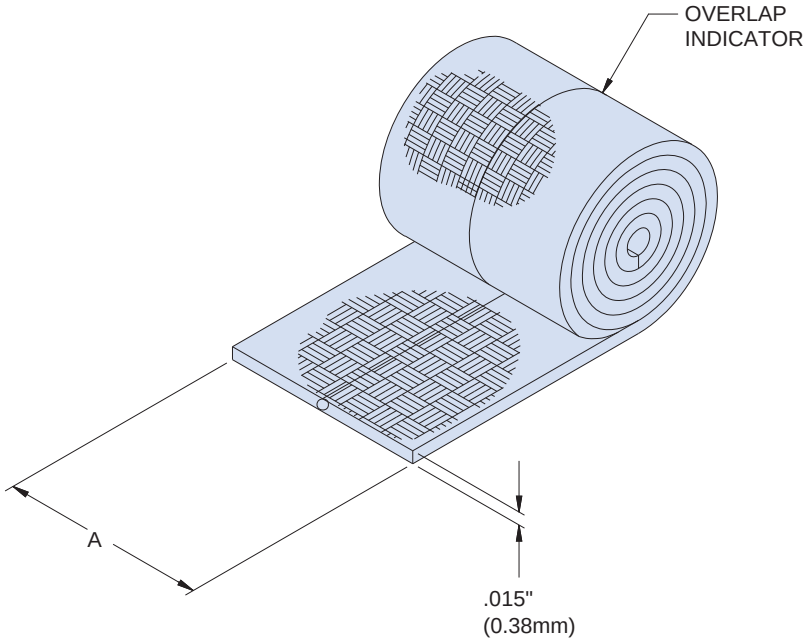
103-102 Mesh tape, Nomex® (non-adhesive)

SPACE GRADE NASA ESA, JAXA SCREENED

103-102 LIGHTWEIGHT TAPE, NOMEX® FOR MECHANICAL/ABRASION SPOT COVERAGE AND REPAIR

How To Order			
Sample Part Number	**103-102**	**-1**	**GY**
Basic No.	Mesh tape, Nomex®		
Dash No.	**1** = .50" wide tape **2** = 1.00" wide tape **3** = 1.50" wide tape (see Table I for specifications)		
Color option	**W** = White **R** = Red **GN** = Green **GY** = Gray **TN** = Desert Tan **OR** = Orange **Omit** = for standard Black		

Table I			
Dash No.	Nominal Width 'A' Dim.	Approx. Weight (grams/ft.)	Minimum pull strength (lbs) ref.
-1	.50" (12.7mm)	1.5	TBD
-2	1.00" (25.4mm)	3.0	TBD
-3	1.50" (38.1mm)	4.5	TBD



NOTES

1. Order in 1 foot increments. Standard packaging on spools in 50 ft. lengths. Orders of 1–49 ft. will be packaged in individual polybags.

Material:

Woven mesh and overlap tracer - high temperature DuPont™ Nomex® thread; Monofilament - PEEK

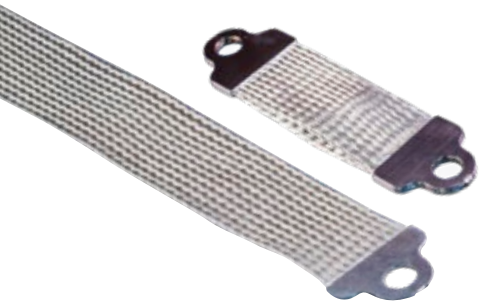
DuPont™ and Nomex® are trademarks or registered trademarks of E.I. duPont de Nemours and Company.

WEIGHT-SAVING, LOW-PROFILE

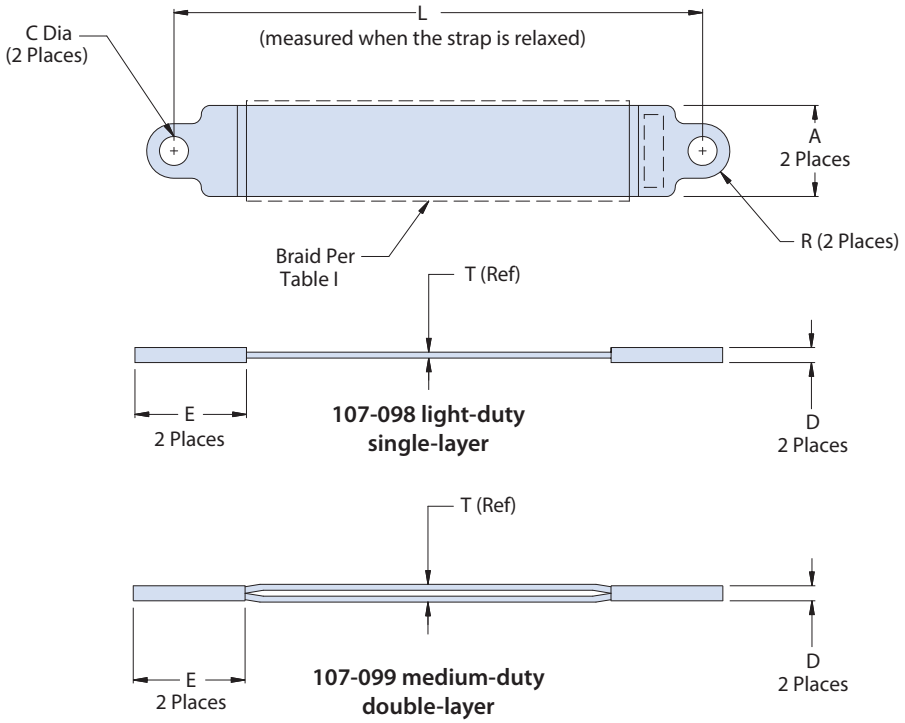
ArmorLite™ ESD Grounding Straps

Series 107 • Single and dual layer • soldered lugs

LIGHTWEIGHT ARMORLITE™ MICROFILAMENT GROUND STRAPS, SOLDERED LUGS



How To Order				
Sample Part Number	**107-098**	**-A**	**-12**	**-6**
Grounding Strap	**-098** = Single layer light duty ArmorLite **-099** = Dual layer medium duty ArmorLite			
Material	**A** = ArmorLite microfilament stainless steel braid			
Width Code	(See Table II)			
Length	Dimension (L) in one inch increment			



- **For grounding airframe sections, dissipating static build-up in composite structures, dissipating lightning strike energy, and grounding individual moving parts**
- **70+% weight savings over standard NiCu braid**
- **Approved for use by major airframe and equipment manufacturers**
- **Lightweight, durable soldered lugs**

Table II: Mechanical/Electrical Parameters for ArmorLite Material

Width Code	A ± .03	C	R	D	E	T	Nom. Resistance mOhm/m* (AWG Equiv.)	Lug Junction Resistance mOhm	Weight gr/m*	Inductance nH/m (Ref. Only)	Test Current Amps**	Tensile Strength Lbf
12	.290 (7.37)	.150 (3.81)	.145 (3.68)	.042 (1.06)	.480 (12.19)	.016 (.41)	48 (22)	0.129	9.0	1277	37	130
20	.480 (12.19)	.200 (5.08)	.240 (6.10)	.042 (1.06)	.690 (17.53)	.016 (.41)	26 (19)	0.111	13.4	1170	52	216
24	.590 (14.99)	.260 (6.60)	.295 (7.49)	.042 (1.06)	.790 (20.06)	.016 (.41)	23 (18)	0.097	17.9	1116	62	219
32	.820 (2.83)	.390 (9.91)	.375 (9.53)	.052 (1.32)	.950 (24.13)	.021 (.53)	13 (16)	0.089	35.8	1047	127	483
40	.870 (22.10)	.390 (9.91)	.375 (9.53)	.052 (1.32)	.950 (24.13)	.021 (.53)	11 (15)	0.061	40.3	1034	141	524
48	1.080 (27.43)	.390 (9.91)	.375 (9.53)	.052 (1.32)	.950 (24.13)	.021 (.53)	8 (14)	0.054	53.8	983	162	590
64	1.330 (33.78)	.390 (9.91)	.375 (9.53)	.052 (1.32)	.950 (24.13)	.021 (.53)	6 (12)	0.047	71.7	936	208	723
for 107-099 double-layer straps												
48	1.080 (27.43)	.390 (9.91)	.375 (9.53)	.080 (2.03)	1.15 (29.21)	.042 (1.06)	4 (11)	0.054	107.6	976	500	590
64	1.330 (33.78)	.390 (9.91)	.375 (9.53)	.080 (2.03)	1.15 (29.21)	.042 (1.06)	3 (10)	0.047	143.4	930	650	723

* Braid only, figures exclude termination lugs. **Test current is defined as the current required to reach 200° C at ambient temperature

WEIGHT-SAVING, LOW-PROFILE

ArmorLite™ ESD Grounding Straps

107-080 • Single and dual layer • configurable heavy-duty solder-free crimp lugs

SPACE GRADE NASA ESA, JAXA SCREENED

LIGHTWEIGHT ARMORLITE™ MICROFILAMENT GROUND STRAPS, SOLDER-FREE CRIMP LUGS

- **For grounding airframe sections, dissipating static build-up in composite structures, and lightning strike energy**
- **70+% weight savings over standard NiCu braid**
- **Approved for use by major airframe and equipment manufacturers**

How To Order					
Sample Part Number	**107-080**	**S**	**12**	**A**	**-6**
Grounding Strap	**-080** = ArmorLite ground strap with crimp lugs				
Layer Code	**S** = Single-layer braid **D** = Double-layer braid				
Width Code	See Table I				
Lug Hole Code	See Table II				
Length	Dimension (L) in one inch increment				

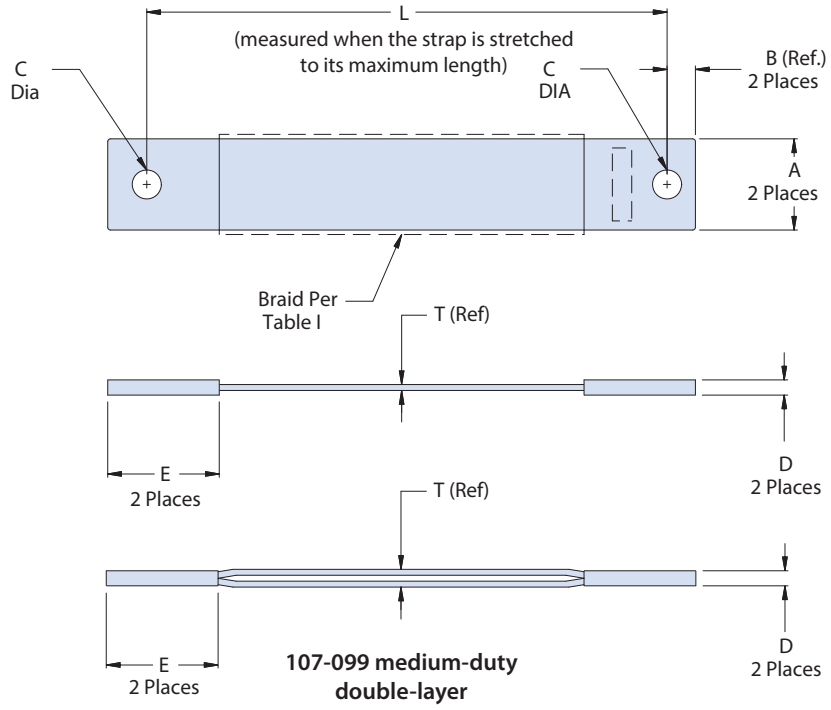


Table III: Lug Hole Size Codes

Lug 1 & 2 Hole Size Code	C Dia.	Stud Size (Ref.)
A	.120 / .128 (3.0 / 3.3)	#3, #4
B	.147 / .152 (3.7 / 3.9)	#5, #6
C	.172 / .180 (4.4 / 4.6)	#8
D	.199 / .204 (5.1 / 5.2)	#10
E	.257 / .266 (6.5 / 6.8)	#12, #14, 1/4
F	.323 / .328 (8.2 / 8.3)	5/16
G	.386 / .391 (9.8 / 9.9)	3/8

Table I: Mechanical/Electrical Parameters for ArmorLite Material

Width Code	A ± .03	B	D		E	T		Nom. Resistance mOhm/m*(AWG Equiv.)		Weight gr/m*		Inductance nH/m (Ref. Only)		Max. Recommended Lug Code
			single-layer braid	double-layer braid		single-layer braid	double-layer braid	single-layer braid	double-layer braid	single-layer braid	double-layer braid	single-layer braid	double-layer braid	
12	.24 (6.1)	.375 (9.5)	.056 (1.4)	.072 (1.8)	.75 (19.1)	.016 (.4)	.032 (.8)	48 (22)	24	9.0	18	1277	1260	B
20	.43 (10.9)	.5 (12.7)	.072 (1.8)	.086 (2.2)	.75 (19.1)	.016 (.4)	.032 (.8)	26 (19)	13	13.4	26.8	1170	1159	F
24	.52 (13.2)	.5 (12.7)	.072 (1.8)	.086 (2.2)	1.00 (25.4)	.016 (.4)	.032 (.8)	23 (18)	11.5	17.9	35.8	1116	1109	G
32	.76 (19.3)	.5 (12.7)	.102 (2.6)	.123 (3.1)	1.00 (25.4)	.021 (.5)	.042 (1.1)	13 (16)	6.5	35.8	71.6	1047	1040	G
40	.88 (22.4)	.5 (12.7)	.102 (2.6)	.123 (3.1)	1.00 (25.4)	.021 (.5)	.042 (1.1)	11 (15)	5.5	40.3	80.6	1034	1027	G
48	1.02 (25.9)	.5 (12.7)	.102 (2.6)	.123 (3.1)	1.00 (25.4)	.021 (.5)	.042 (1.1)	8 (14)	4	53.8	107.6	983	976	G
64	1.15 (29.2)	.5 (12.7)	.102 (2.6)	.123 (3.1)	1.00 (25.4)	.021 (.5)	.042 (1.1)	6 (12)	3	71.7	143.4	936	930	G

* Braid only, figures exclude termination lugs. **Test current is defined as the current required to reach 200° C at ambient temperature

Glenair®

SPACE-GRADE

Complex Cable Assemblies

Commander Ed White on the first American spacewalk, 1965 with Glenair-manufactured "Golden Umbilical" cable

We like to begin our presentation of Glenair's proven-performance space-grade products with the golden umbilical life support cable used by Commander Ed White in the first American space walk in 1965. This was a complex cable assembly with an exacting set of performance requirements. Even though this application is now over 50 years old, it still reflects Glenair's design and fabrication expertise and that we have been a go-to supplier for the space industry for almost 5 decades. Today we continue to fabricate high-performance cables for space, from rugged Viton® overmolded designs to ultra-lightweight SpaceWire jumpers for the high-speed space data transmission protocol. Other notable space cable applications include:

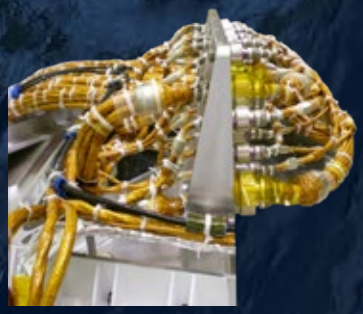
- Dozens of robotic spacecraft, including orbiters, landers, and rovers, have been launched to Mars since the 1960s. Glenair cables have ridden along on several, helping to fulfill navigation, data and communication requirements.
- Complex interconnect cable assemblies made by Glenair have also traveled to and from orbit dozens of times on the Space Shuttle, as well as numerous space-launch vehicles. Glenair-made interconnect harnesses also served on all twelve manned Gemini capsules.

PROVEN PERFORMANCE IN SPACE

- The "Golden Umbilical" life-support cable
- JPL Mars probes (orbiters, landers, and the Curiosity rover)
- AIRS satellite
- Gravity Probe mission
- Space Shuttle
- Titan II launch vehicles
- SpaceWire (MIL-DTL-83513)

COMPLEX MULTIBRANCH AND OVERMOLDED CABLE ASSEMBLIES

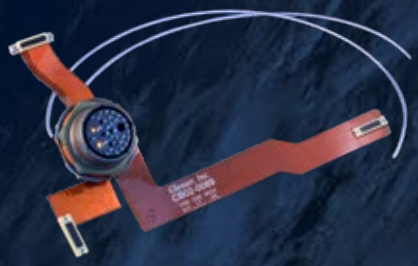
Multibranch wire harness for a space lab application



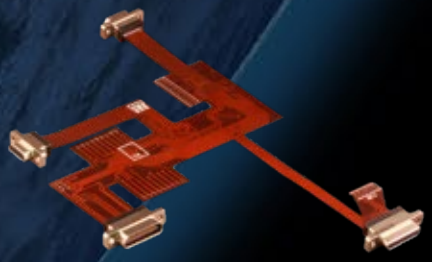
Complex Mighty Mouse cable harness for a Mars rover application

ESA and NASA screened Micro-D/Nano cable assembly

Space-grade Micro-D flex assemby with NASA EEE-INST-002 screening



Hybrid flex/rigid flex multibranch Micro-D flex assembly with discrete RF circuits



Micro-D subminiature multibranch flex assembly

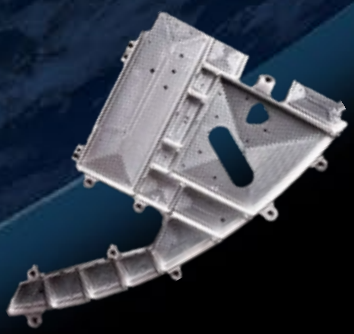
TURNKEY FACTORY-TERMINATED CONDUIT ASSEMBLIES

Complex multibranch high altitude electrical wire conduit assembly

Lightweight, halogen-free wire conduit assembly

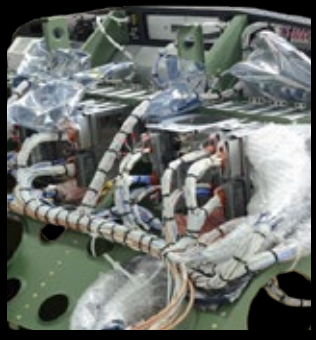
Crush-resistant aerospace metal-core conduit assembly

AEROSPACE-GRADE INTEGRATED SYSTEMS



Precision-machined, injection molded or stamped-and-formed boxes and structural members

Military-aerospace and space-grade multibranch interconnect cable assembly staff and facilities



Turnkey integrated system assemblies

Dimensions in Inches (millimeters) are subject to change without notice.

Glenair®

Artist concept of NASA's Juno spacecraft, exploring Jupiter. Credit NASA/JPL-Caltech

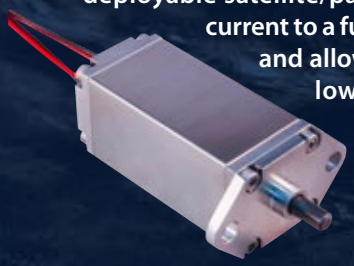
SERIES 06 HDRM

Pyrotechnic-Free Space Mechanisms

Glenair pyrotechnic-free release mechanisms offer quick release time, low shock, relatively low power input, and virtually no temperature sensitivity. Series includes separation nuts, HDRMs, pin pushers, and pin pullers—direct wired or connectorized—with higher preload carrying capacity compared to competitor solutions.

High-reliability, non-explosive (split-spool) HDRMs, separation nuts, and pin pullers/ pushers for dependable stowage and release of deployable space systems

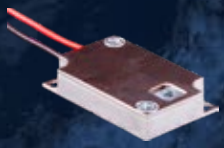
Glenair HDRM space mechanisms are optimized for foolproof release reliability with built-in mechanical and electrical redundancy. The planned release of the deployable satellite/payload is activated by a pre-determined value of electrical current to a fuse-wire system which causes the wire to break under tension and allows a pre-loaded mechanical bolt to actuate. Glenair's line of low-shock, redundant and non-redundant space mechanims includes both HDRM devices as well as a family of pin pushers and pin pullers. Customer-defined housing and mounting configurations are available. Consult factory for specific device TR level and qualification test reports.



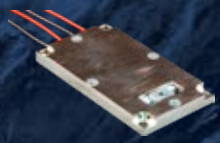
- **Pyrotechnic-free alternative (low-shock fuse-wire) for single-event release of deployable space systems—electrical initiation up to 5 amps**
- **User-serviceable and refurbishable units**
- **Redundant or non-redundant actuation circuit**
- **Not susceptible to transient and noise (EMI/ EMP/ESD/RFI) inputs**
- **Extended temperature ranges: -150°C to +150°C**

HDRM CATALOG PRODUCT SELECTION GUIDE

Note: Preloading assembly, release actuator, and load-carrying structure may also be custom-packaged per customer requirements



061-002
Light-Duty HDRM
Non-redundant circuit,
5 or 20 lb release preload



061-003
Light-Duty HDRM
Redundant circuit,
30 lb release preload

061-014
Light-Duty HDRM
Non-redundant circuit,
75 lb release preload,
Side load bearing

061-007
Medium-Duty HDRM
Redundant circuit,
300 lb release

061-006
Medium-Duty HDRM
Redundant circuit,
1000 lb release preload

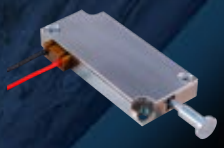
061-005
Medium-Duty HDRM
Redundant circuit,
2500 lb release preload

062-002
Heavy-Duty HDRM
Redundant circuit,
5000 lb release preload

063-001
Heavy-Duty HDRM
Redundant circuit,
8750 lb release preload

064-001
Heavy-Duty HDRM
Non-redundant circuit,
20,000 lb release preload

061-010
Light-Duty Pin Pusher
Non-redundant circuit
6 lb push force



061-009
Light-Duty Pin Puller
Non-redundant circuit
18 lb pull force

061-011
Light-Duty Pin Puller
Non-redundant circuit
18 lb pull force

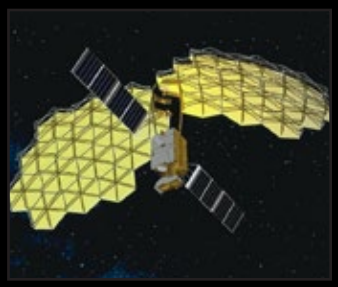
061-013
Medium-Duty Pin Puller
Redundant circuit
50 lb pull force

DEPLOYMENT APPLICATIONS

Solar Arrays

Booms and Masts

Antennas



Reflectors

Dimensions in Inches (millimeters) are subject to change without notice.
Rev. 01.15.19

Glenair®

PhoneSat 2.5 CubeSats at
NASA Ames Research Center

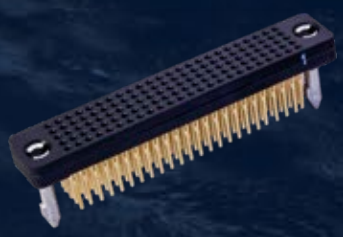
HD STACKER™

High-density, solder-free, PCIe-ready board-to-board stackable connectors

Mission-critical board-to-board connector applications demand fail-safe signal integrity as well as rugged and reliable harsh-environment performance. The HD Stacker™ brings Glenair innovation to stacking board-to-board connectors with several significant design improvements: Ultra high-density .0625" Chevron Contact System provides 55% more contacts per connector size, or a 31% size reduction for the same number of contacts as compared to current industry solutions. Polarized connector bodies and available polarized guide pins prevent accidental mismating. The solder-free press-fit compliant pin contacts are removable, repairable, and available in custom lengths. HD Stacker™ connectors may also be ordered with pre-wired cable or flex jumper terminations. High-speed signal integrity test reports are available upon request. Choose HD Stacker™ for the ultimate in high-density, rugged board-to-board stackable connector performance.

- High-density .0625" pitch Chevron Contact System
- PCIe Rev 3 capable
- Signal integrity to 10.5Gb/sec.
- Polarized insulator and hardware options
- Solder free "eye of the needle" compliant tail for press fit installation
- High-temp PPS insulator meets NASA outgassing requirements
- Available wired / flex jumpers
- Available between-board spacers up to 1 inch

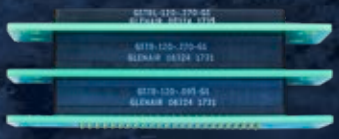
HD STACKER™ FOR MISSION-CRITICAL BOARD-TO-BOARD APPLICATIONS



Solder-free press-fit (compliant pin) board mounting

.0625" pitch contact spacing: highest available density

Polarized shells and keyed guide pin hardware prevent mis-mating



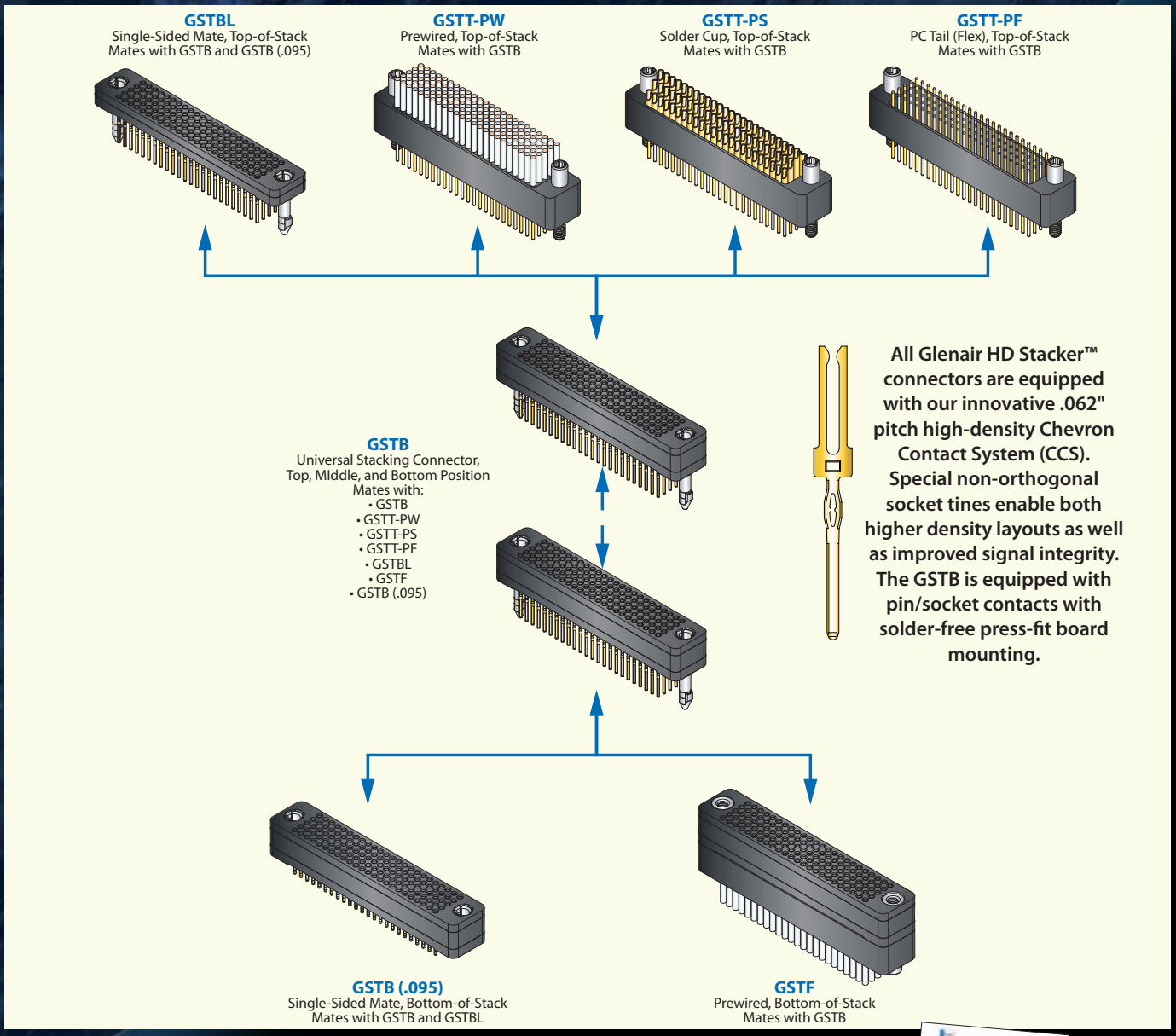
Controlled signal integrity for differential applications (PCIe Rev 3 capable)

.0625” PITCH COMPLIANT PIN

High-Density Stacker™

Rugged board-to-board stackable connectors

HD STACKER™ POSITION AND MATING COMPATIBILITY GUIDE



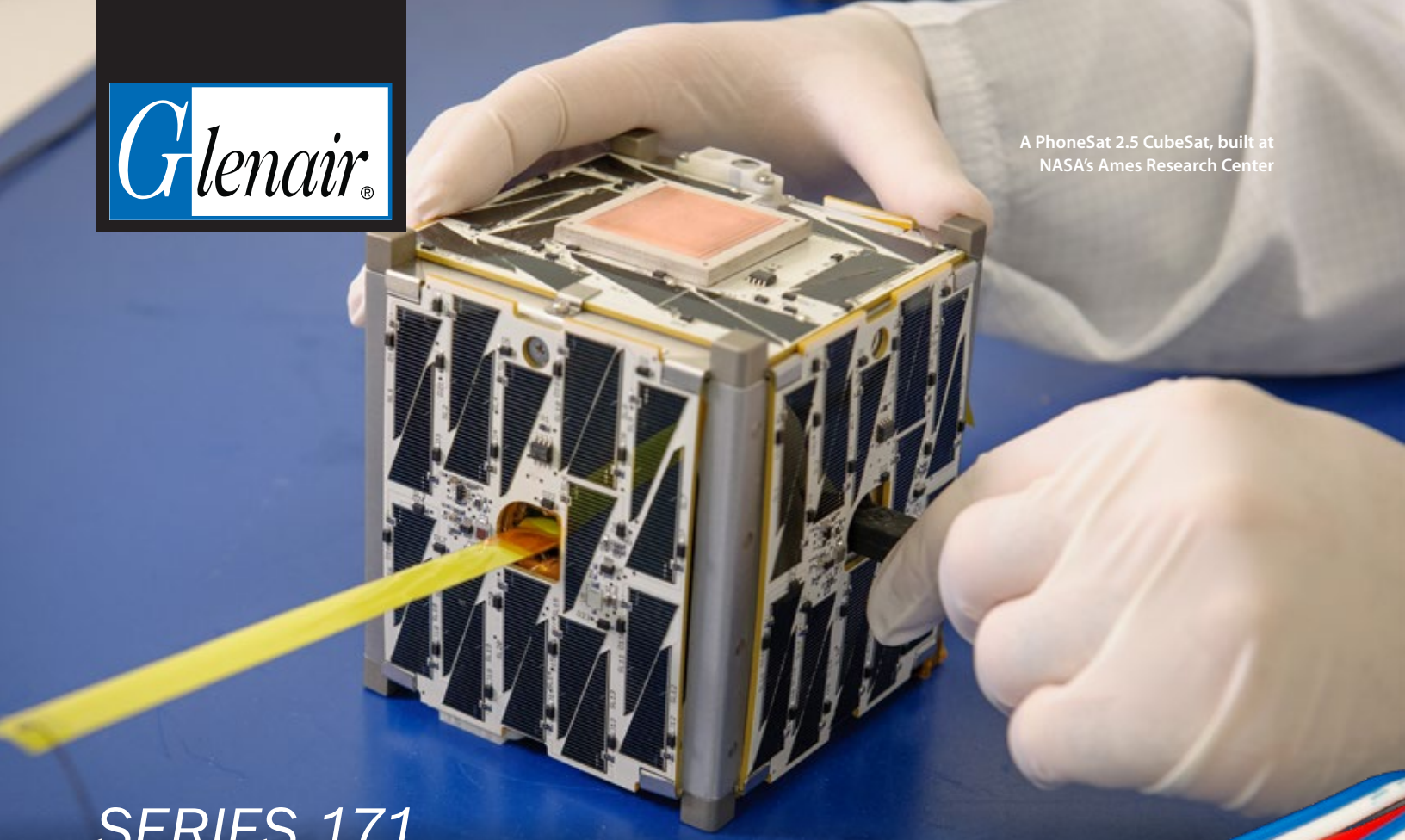
All Glenair HD Stacker™ connectors are equipped with our innovative .062" pitch high-density Chevron Contact System (CCS). Special non-orthogonal socket tines enable both higher density layouts as well as improved signal integrity. The GSTB is equipped with pin/socket contacts with solder-free press-fit board mounting.

QUALIFICATION TESTING / HIGH-SPEED PERFORMANCE

Stacker connectors were qualified in accordance with MIL-DTL-55302G testing for:

- Contact engagement/separation
- Contact retention
- DWV
- Electrical resistance
- Mechanical vibration and shock
- Insulation resistance
- Thermal shock
- Contact resistance
- Humidity

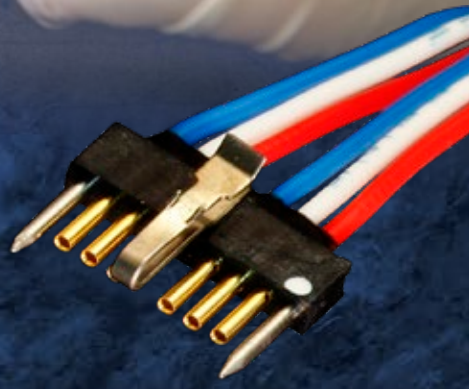
High-frequency electrical performace tests were performed for: Insertion loss, return loss, crosstalk, and time domain performance metrics including impedance and eye pattern. Complete test reports are available at **www.glenair.com/technical_information_test_reports**



A PhoneSat 2.5 CubeSat, built at NASA's Ames Research Center

SERIES 171

Latching MicroStrips™

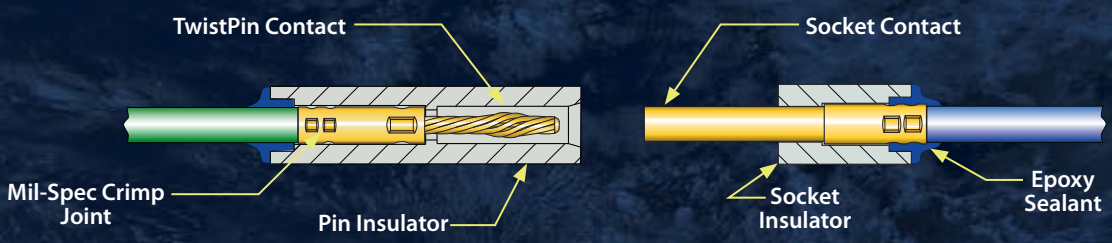


TwistPin performance and durability in an economical, space-saving single row package

Series 171 MicroStrips™ are made for high-reliability wire-to-board and wire-to-wire applications. These high-density strip connectors are typically used in ruggedized 3 Amp signal applications, where higher-performance contacts, precision machined shells and space-grade dielectrics offer significant advantages compared to commercial-grade headers and jumpers. Glenair's rugged, high force TwistPin contact accepts up to #24 gage wire, the current rating is 3 Amps, the voltage rating is 600 Vac, and the temperature rating is -55C to +150C. The Series 171 Latching MicroStrip connector meets all applicable requirements of MIL-DTL-83513. Choose solder cup, pre-wired, or printed circuit board versions. A stainless steel latch provides secure coupling.

- High-reliability TwistPin contact system
- #24-30 AWG wire size
- .050" pitch contact spacing
- Solder cup, pre-wired or PCB header terminations
- 3 Amps, +150C, 600 Vac

LATCHING MICROSTRIP™ CROSS-SECTIONAL VIEW



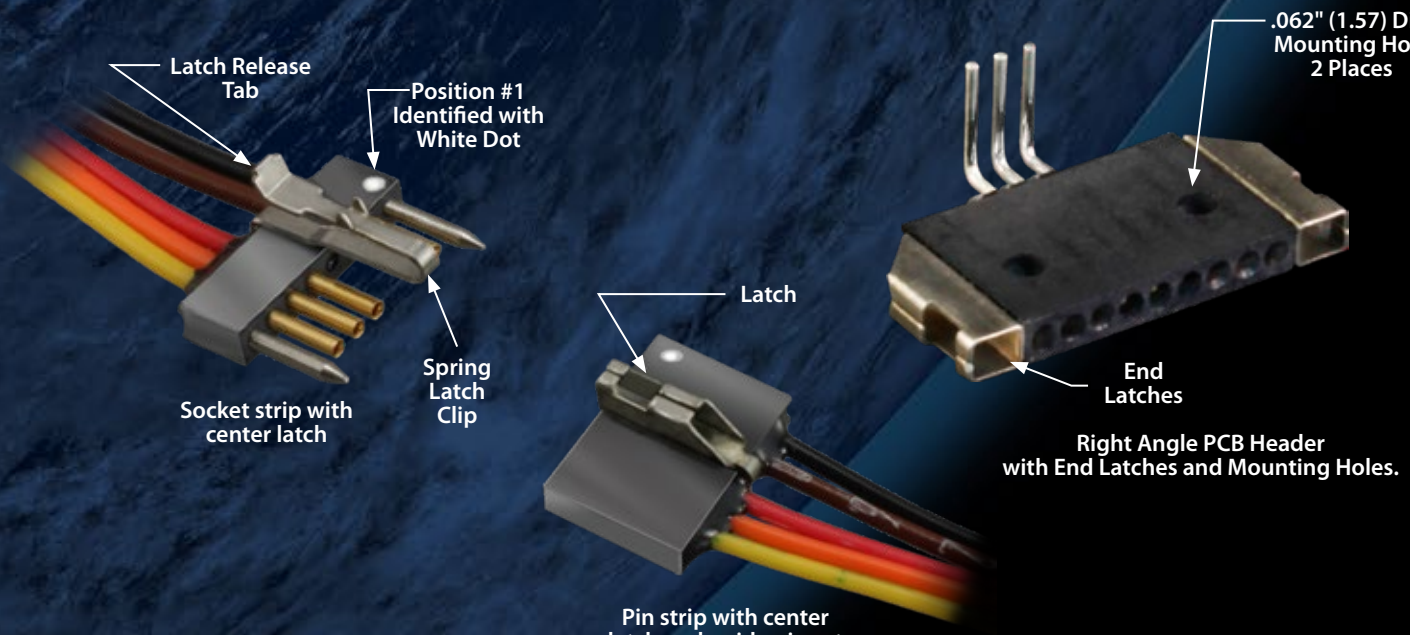
SERIES 171

Latching MicroStrips™

Superior TwistPin contact performance

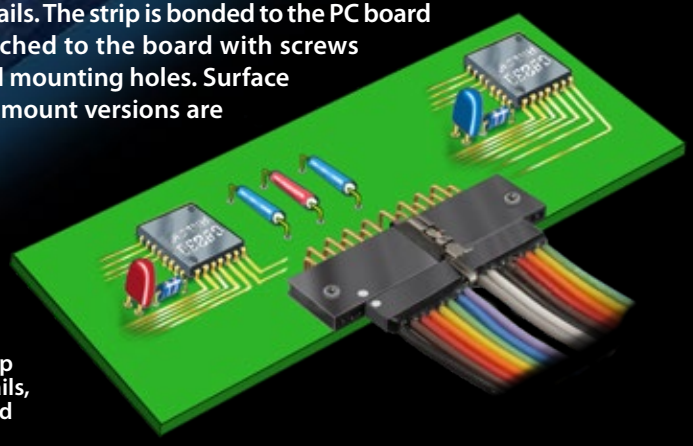
ABOUT SPRING LATCHES, GUIDE PINS AND MOUNTING HOLES

Optional stainless steel latch clips provide secure mating when subjected to shock and vibration. A single center latch is suitable for most applications. Dual end latches are also available. The spring latch is always installed on the socket strip. The latch receiver is installed on the pin strip. To unmate the connectors, simply press the release tab while pulling the connectors apart. MicroStrips™ are available with stainless steel guide pins. A single guide pin provides circuit polarization. A guide pin on each end helps to align connectors when mating and prevents damage to contacts. For most applications the preferred configuration is a single center latch with no guide pins. Mounting holes are now available. Attach strips to circuit boards with size 0-80 screws (customer-supplied).



ABOUT BOARD MOUNT STRIPS

Space customers typically use MicroStrips™ for high reliability board-to-wire I/O applications. The pin strip is usually configured with right angle thru-hole PC tails. The strip is bonded to the PC board with epoxy, or attached to the board with screws installed in optional mounting holes. Surface mount and vertical mount versions are also available.



Right angle pin strip with staggered PC tails, mounting holes and center latch

SINGLE ROW BACK-TO-BACK MICROSTRIPS

.050" pitch single row surface mount back-to-back microstrip

Dimensions in Inches (millimeters) are subject to change without notice.

Physical layer SpaceWire router aboard the James Webb Space Telescope (NASA)

SpaceWire Cable Assemblies

Flight- and lab-grade SpaceWire qualified cable assemblies for IEEE 1355 space network node interconnection of routers, switches, recorders, transceivers, and other physical layer devices

The success of any space mission begins with reliable data transmission and Glenair Spacewire cables, built to meet the strict standards set forth by ECSS-E-ST-50-12C make this a reality. Our Spacewire cables offer bidirectional, high speed data transmission rates up to 400 Mbits/s while significantly reducing cross talk, skew, and signal attenuation. By incorporating a serial, point-to-point cable, with low voltage differential signaling (LVDS) reduced costs are realized through an easily integrated data transmission cable. These features allow Spacewire cables to be incorporated across various satellite data transmission programs without the expense of costly design customization.

Glenair Spacewire assemblies begin with a high performance cable built with expanded polytetraflouroethylene (ePTFE) insulation. This material allows for low-loss transmission of LVDS signals, maximizing data-rates while allowing for the implementation of standard hardware protocols, thus eliminating the need for design customization and long lead time cable projects.

TYPICAL USES INCLUDE

- EGSE applications
- Radar sensor systems
- Hi-resolution camera equipment
- Sensor, mass-memory unit, and telemetry subsystem interconnections

APPROVED FOR USE BY:

- ESA
- NASA
- JAXA
- RKA

CONNECTOR/CABLE

- **Laboratory and space-grade versions available**
- **Qualified MIL-DTL-83513 Micro-D connectors**
- **Gold-plated copper alloy TwistPin contacts**
- **Basic cable, 4 twisted pair cables and a ground**
- **Epoxy resin potting**
- **EMI banding backshell**

PERFORMANCE

- **3 Amps**
- **Temperature tolerance -200° to 180° C**
- **100 Ω impedance shielded signal pair**
- **Very low skew, signal attenuation and crosstalk**
- **65dB minimum attenuation shielding effectiveness**
- **Low magnetic permeability IAW EIA-364-54**

POINT-TO-POINT AND SINGLE-ENDED

SpaceWire cable assemblies

Technical specifications / how-to-order

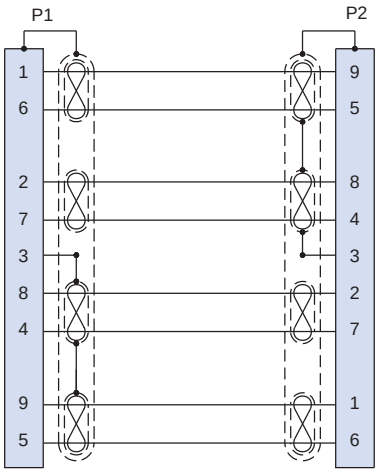
NOTES:

1. Flight grade (cable Type F) assemblies to be screened IAW NASA EEE-INST-002, Table 2. Level 1 with 100% thermal vacuum outgassing (24 hours/+125°C/10^{-6} torr). Reference Glenair Mod Code 429C.
2. Operating temperature - 200°C to +180°C. Reference Glenair Mod Code 428.
3. Electrical performance:
   Dielectric withstanding voltage: 600 VAC.
   Insulation resistance: 5000 megohms @500 VDC.
4. Assembly to be identified with Glenair's name, Part Number, Cage Code and Date Code or ESCC Component Part Marking Standards.

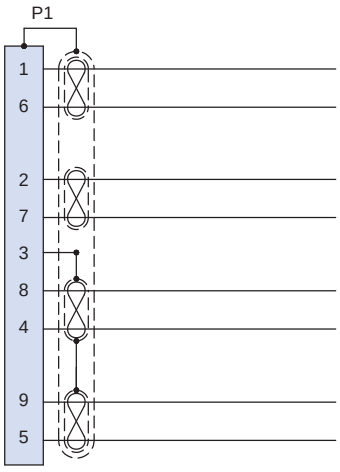
MATERIALS/FINISH:

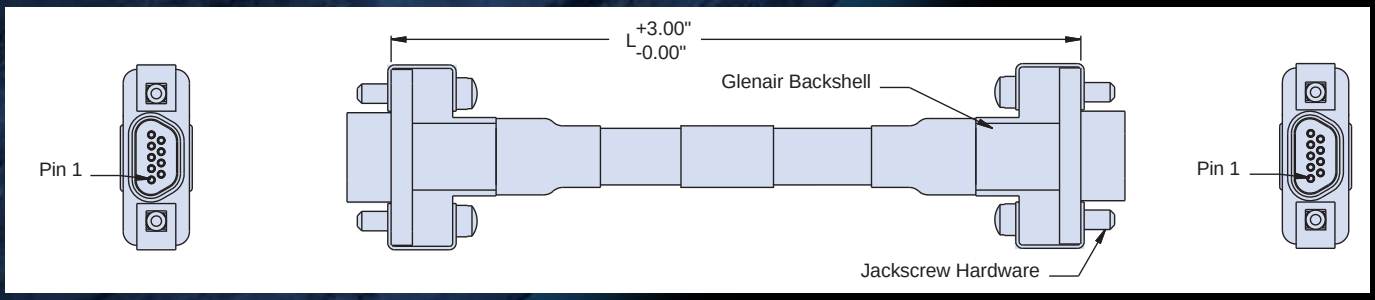
- Shells/backshells - aluminum alloy/electroless nickel.
- Insulators - high grade rigid dielectric/N.A.
- Contacts - copper alloy, gold plated.
- Hardware - stainless steel/passivated.

Back To Back Wiring
Diagram (GP)



Single Ended Wiring
Diagram (P)





How To Order Spacewire											
Sample Part Number	**GSWM**	**2**	**L**	**-9**	**GP**	**-6**	**F**	**B**	**-16**	**S**
Product Series	**GSWM**–Glenair Spacewire Micro-D									
Shell Plating	**2**–Electroless Nickel **5**–Gold									
Insulator Material	**L**–LCP									
Shell Size	**-9**									
Connector Type	**P**–Single Ended Pin (Plug) **GP**–Pin (Plug) Connector Both Ends									
Wire Gauge	**-6**–26 AWG **-8**–28 AWG **-0**–30 AWG (30 AWG–Lab Only)									
Cable Type	**F**–Flight Grade **L**–Lab Grade									
Termination Option	**B**–Backshell									
Cable Length In Inches	**-16** = 16 inches (12 inches minimum)									
Hardware	**S**–Male Slotted Jackscrew **P**–Female Jackpost									

Dimensions in Inches (millimeters) are subject to change without notice.

Glenair®

JAXA Kibo Laboratory module from the International Space Station

Certified SpaceWire cables for both laboratory/test applications and flight applications

SPACE GRADE
NASA ESA, JAXA SCREENED

SERIES MWDM

Micro-D Connectors

Standard

Hermetic

EMI Filter

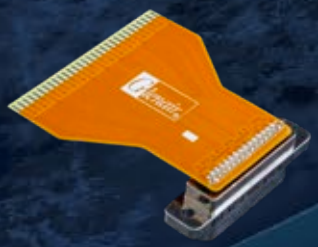
- High density Micro TwistPin contacts set on .050" centers
- 9 to 130 contact arrangements
- Pigtail, PCB, solder cup, and flex terminations
- Single row, multi-row, low profile and high density insert arrangements
- QPL and commercial versions
- Same-day availability on all part numbers
- Qualified for use in ESA, NASA, JAXA applications

TwistPin equipped MIL-DTL-83513 Micro-D connectors offer outstanding mating performance, durability and minimal contact resistance

MasterLatch™

Surface Mount

Rear Panel Mount



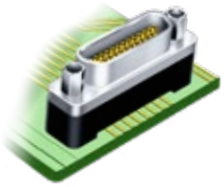
Flex Circuit

MIL-DTL-83513 AND COMMERCIAL

Micro-D Connectors

Mission-critical mating performance

Metal Shell Micro-D for Harnessing Applications					
					
GRPM Solder Cup	GRPM Insulated Wire	GRPM Uninsulated Wire	MWDM Solder Cup	MWDM Insulated Wire	MWDM Back-To-Backs
					
Shielded Cable Assembly	MWDM Uninsulated Wire	GMDR Insulated Wire	GMDE Environmental	GSWM SpaceWire	GMLM MasterLatch

Micro-Ds for Printed Circuit Board			
			
GRPM-CBS	GRPM-CBR	MWDM-BS	MWDM-BR
			
MWDM-CBR	MWDM-CBS	90° Surface Mount	GMR7580
			
GMR7590	GMR7580C	GMR7590C	Right Angle Filter

WellMaster™ 260

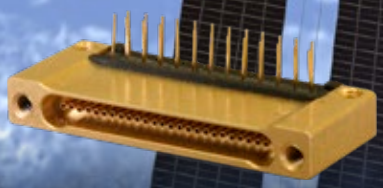
Sav-Con®

Latching MicroStrip

Low Profile

Dimensions in Inches (millimeters) are subject to change without notice.

The International Space Station



SERIES 89

Nanominiature Connectors

MIL-DTL-32139 qualified connectors for mission-critical board-to-wire applications—simply the smallest and lightest mil-spec connector in the business

- 1 Amp current rating
- .025 Inch (0.64 mm) contact spacing
- #30 And #32 gage wire accommodation
- Single and double row
- Metal shell, aluminum, titanium or stainless steel
- TwistPin contact system
- Gold alloy contact, unplated
- Thru-hole and surface-mount PCB versions

THE NANO TWISTPIN ADVANTAGE

Transverse cross-section of a TwistPin contact crimped to solid wire

- Gas-Tight Crimp Joint
- Better Shock and Vibration Performance
- Corrosion Proof Contact Alloy

SERIES 89

Nanominiature Connectors

The smallest and lightest mil-spec connector

Series 89 Nanominiature Connector Performance Summary	
Contact Spacing	.025" (0.64mm) Contact Centers
Wire Accommodation	#30-#32 AWG
Current Rating	1 AMP Max
DWV	250 VAC RMS Sea Level
Insulation Resistance	5000 Megohms Minimum
Operating Temperature	-55° C. to +125° C.
Contact Resistance	71 Millivolt Drop Maximum
Shock, Vibration	100g's, 20 g's
Durability	200 Mating Cycles
Corrosion Resistance	48 Hours Salt Spray
Mating Force	5 Ounce Max, 0.4 Ounce Min

How Small Are They?

D-Subminiature Connector
25 Contacts
on 0.109 Inch Spacing

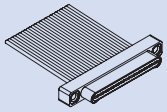
Micro-D Connector
25 Contacts
on 0.050 Inch Spacing

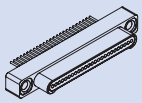
Nano Connector
25 Contacts
on 0.025 Inch Spacing

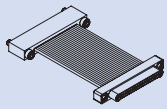
Now available: space-grade Nano circulars

Series 89 Nanominiature Product Selection Guide

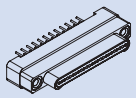
Pre-Wired Single Row Connectors

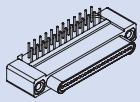

Insulated Wire

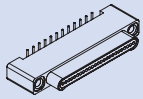

Uninsulated Wire

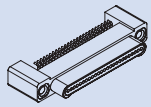

Back-to-Back Cables

Pre-Wired PCB Connectors

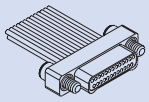

Thru-Hole Vertical

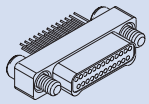

Thru-Hole 90°

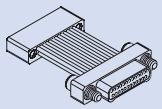

SMT Vertical


SMT 90°

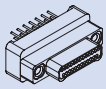
Pre-Wired Double Row Connectors

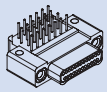

Insulated Wire

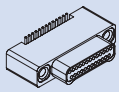

Uninsulated Wire

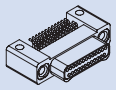

Back-to-Back Cables

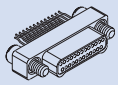
Double Row PCB Connectors


Thru-Hole Vertical

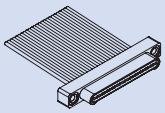

Thru-Hole 90°

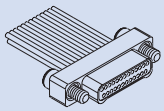

SMT Vertical


SMT 90°


SMT Straddler

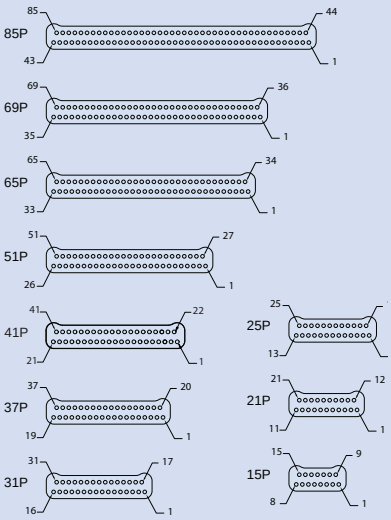
Pre-Wired MIL-DTL-32139 Connectors


Single Row, Insulated Wire

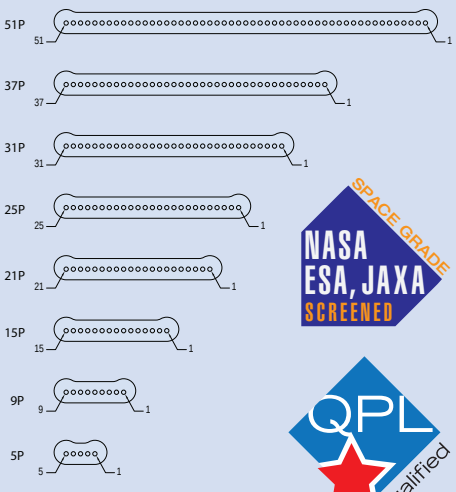

Double Row, Insulated Wire

NANOMINIATURE CONTACT ARRANGEMENTS

Single Row Mating Face of Pin (Plug) Connector



Double Row Mating Face of Pin (Plug) Connector

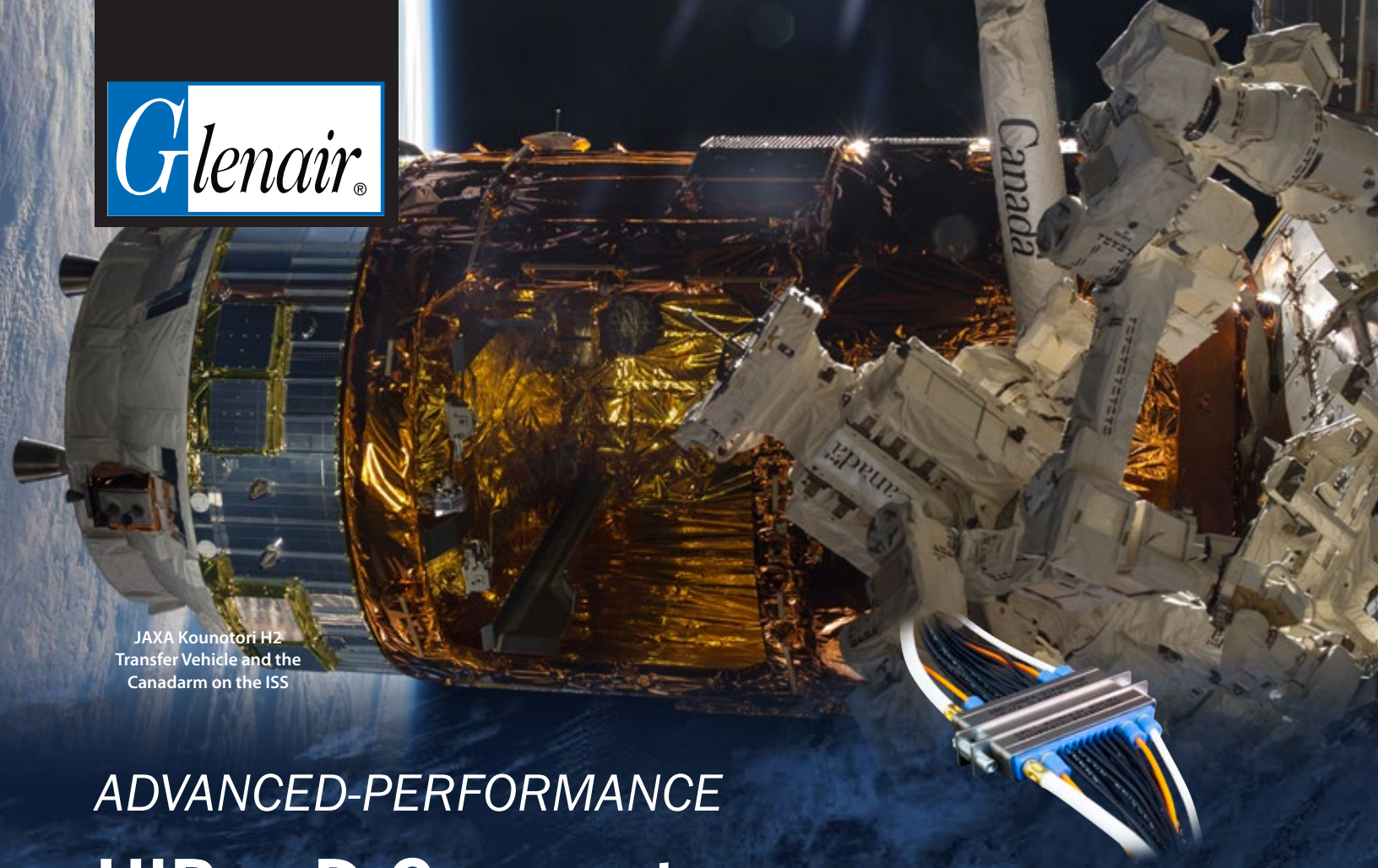


SPACE GRADE
NASA
ESA, JAXA
SCREENED

QPL
qualified

INTERCONNECT SHOWCASE

Dimensions in Inches (millimeters) are subject to change without notice.



JAXA Kounotori H2 Transfer Vehicle and the Canadarm on the ISS

ADVANCED-PERFORMANCE

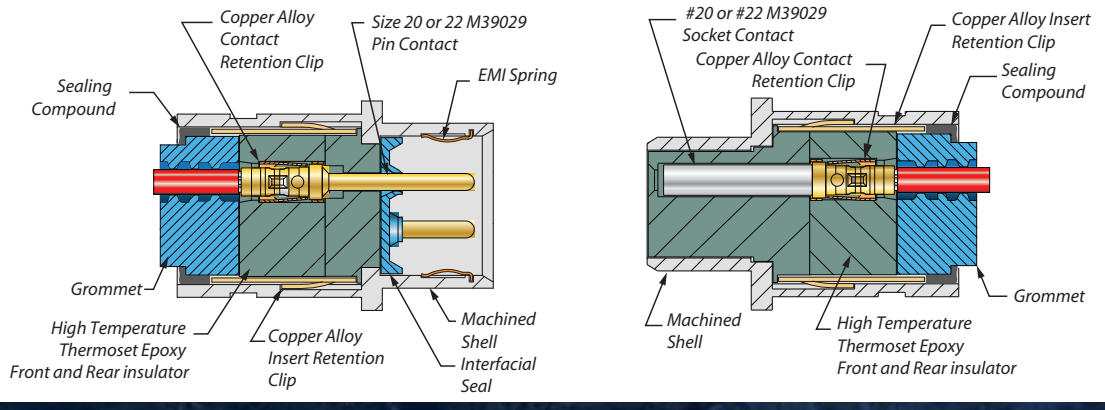
HiPer-D Connectors

Space-grade M24308 intermateable

The HiPer-D connector is a M24308-type D-Subminiature connector with superior design features. Unlike standard M24308 connectors with stamped steel shells, the HiPer-D connector features a one-piece machined shell, 200°C continuous operating temperature rating and enhanced, mated shell EMI/RFI protection via an integrated ground spring. Aerospace grade fluorosilicone grommets and face seals (JAXA / NASA outgassing available) provide environmental protection. The HiPer-D is intermateable, intermountable and interchangeable with standard M24308 D-Sub connectors.

- **Advanced temperature, vibration and EMC/ electrical performance**
- **11 standard and 20 combo insert arrangements**
- **High temperature epoxy insulators**
- **Watertight sealing**
- **Rugged machined one-piece shell**

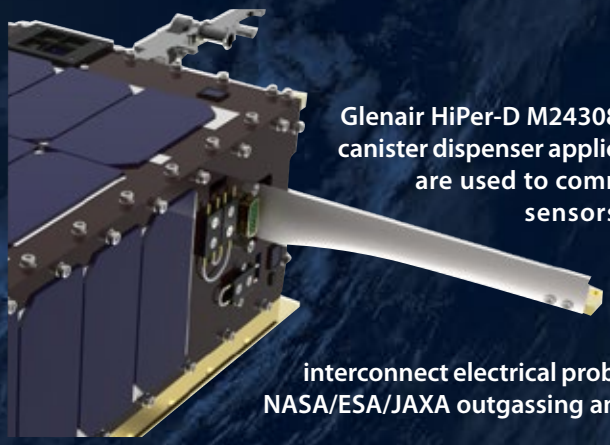
STANDARD AND HIGH DENSITY HiPer-D® - CUTAWAY



SERIES 28

HiPer-D Space Grade Connectors

Product features and specifications



Glenair HiPer-D M24308 D-sub connectors are ideally suited for CubeSat or NanoSat canister dispenser applications where rack and panel or connectorized wire assemblies are used to communicate with HDRMs, pin pullers, pin pushers, door status sensors, as well as system communications and testing prior to deployment of satellite equipment. Standardized usage of M24308 connectors on hardware interfaces simplifies interconnection and communication. Glenair HiPer-D space grade M24308 D-sub connectors eliminate potential interconnect electrical problems on mission critical systems. Connectors are supplied with NASA/ESA/JAXA outgassing and screening in accordance with NASA EEE-INST-0002.

HiPer-D High-Performance D-Sub vs. MIL-STD-24308		
Specification / Feature	**M24308**	**HiPer-D**
Temperature	-55°C to +125°C	-65°C to +200°C
Insulator	Thermoplastic	Thermoset Epoxy
Shell	Steel (Brass)	Aluminum (SST)
Voltage	1000 VAC	1000 VAC
Grounding	Dimples in shell (not in Mil-Spec)	Nickel-plated Copper Alloy EMI spring
Environmental	No	Yes
Vibration, sine	20 g	60 g
Vibration, random	N/A	43 g
Shock	50 g	300 g
Bolt-on backshells	No	Yes

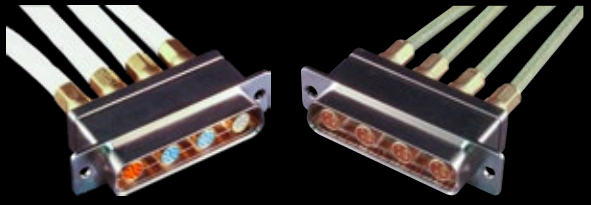
HiPer-D M24308 COMBO-Ds for power, signal, and RF applications

- **Size #8 power and 50 ohm or 75 ohm RF contacts**
- **Mixed layouts with #8's and #20's**
- **200°C continuous operating temperature**
- **20 tooled layouts**
- **Crimp and PC tail terminations**

HIGH-SPEED HiPer-D HIGH-PERFORMANCE M24308

Crimp contact non-environmental connectors with #8 contacts for high-speed data transmission

- **One-piece rugged machined aluminum shell**
- **Two to five size 8 Coax, Twinax, Quadrax or Ochito contacts**
- **Common ground plane (no insulators)**
- **Available in straight and right angle PCB versions**



Glenair®

ESA Astronaut Alexander Gerst in the cupola of the International Space Station

Series 806 Mighty Mouse Mil-Aero Connectors

SPACE GRADE
NASA
ESA, JAXA
SCREENED

Advanced electrical, mechanical and environmental performance *plus reduced size and weight* compared to D38999

Series 806 offers significant size and weight savings while meeting key performance benchmarks for a broad range of applications such as commercial and military aerospace, industrial robotics, transportation systems and more. Designed for general use in harsh vibration, shock and environmental settings—as well as high-altitude, unpressurized aircraft zones with aggressive voltage ratings and altitude immersion standards—the Series 806 Mil-Aero features numerous mechanical design innovations including durable mechanical insert retention, radial seals and triple-ripple grommet seals. Its reduced thread pitch and re-engineered ratchet prevent decoupling problems, particularly in small shell sizes, solving one of the major problems of shell size 9 and 11 MIL-DTL-38999 Series III connectors.

- **Next-generation small form factor aerospace-grade circular connector**
- **Designed for general use in harsh application environments such as aircraft, industrial robotics and more**
- **Upgraded environmental, electrical and mechanical performance**
- **Integrated anti-decoupling technology**
- **Higher density 20HD and 22HD contact arrangements**
- **Glass hermetic, lightweight aluminum hermetic, and filtered versions**
- **+200° C temperature rating**

SAVE SIZE AND WEIGHT WITH SERIES 806 CONNECTORS

Series 806 Mil-Aero
Smallest Size
.500 In. Mating Threads
3 #20 Contacts or 7 #22 contacts

MIL-DTL-38999
Smallest Size
.625 In. Mating Threads
3 #20 Contacts or 6 #22 contacts

MIGHTY MOUSE MIL-AERO

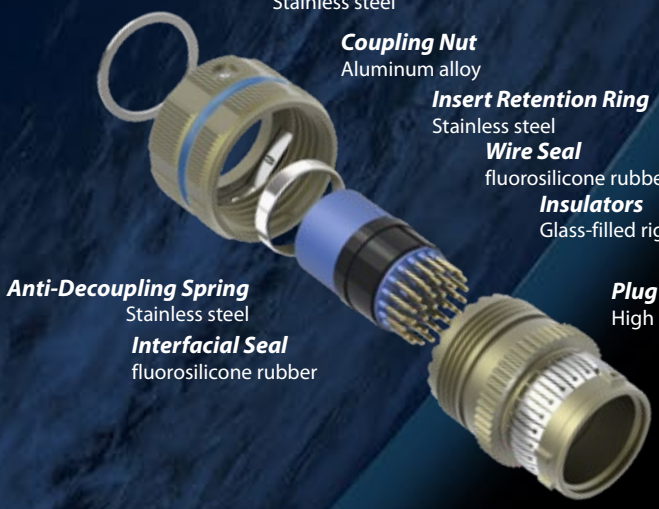
Series 806
Ultraminiature Circular Connectors

Product Features

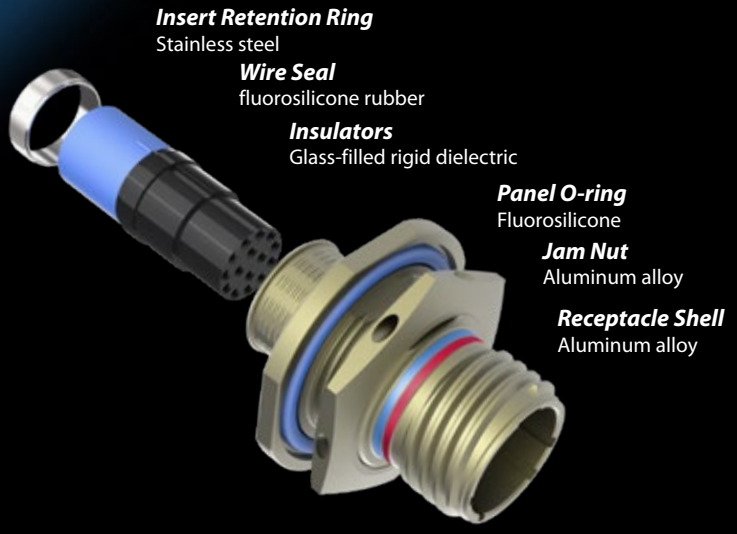
KEY FEATURES

- Next-generation high performance ultraminiature aerospace connector
- Reduced pitch triple-start 60° modified anti-decoupling stub ACME thread
- Higher density 20HD and 22HD contact arrangements
- +200°C operating temperature
- High strength 7075 alloy plug barrel
- "Triple ripple" wire sealing grommet (75,000 ft. rated)
- Snap in, rear release crimp contacts
- Metal contact retention clips
- Integral Nano-Band shield termination platform
- EMI shielding effectiveness per MIL-DTL-38999M para. 4.5.28 (65 dB min. leakage attenuation @ 10GHz)
- 10,000 amp indirect lightning strike
- 300g. shock
- MIL-S-901 Grade A high impact shock
- Aluminum and stainless steel versions
- Environmental crimp contact, glass-to-metal seal PC tail and solder cup hermetics, and EMI filter versions
- RoHS compliant nickel, nickel-PTFE, black zinc and stainless steel plus mil-grade cadmium finish options
- Printed circuit board versions with threaded flange

Plug Connector



Receptacle Connector



Dimensions in Inches (millimeters) are subject to change without notice.

Glenair®

ESA Astronaut Paolo Nespoli working on the ALTEA Shield isotropic equipment aboard the ISS

HIGH PERFORMANCE

Series 791

The next-generation ultraminiature rectangular connector for demanding aerospace applications

Polarized / keyed shells prevent mis-mating and allow designers to specify identical layouts side-by-side without risk of circuit damage

Sometimes the simplest ideas are the best ideas. The Series 791 is a simple idea. Let's create a brand new class of connector – the ultraminiature rectangular. Let's combine the versatility of the Series 790 Micro-D type connector with the rugged features of our popular HiPer-D M24308 type connector. Let's add a unique dual lobe shell and let's recess the pins to eliminate the possibility of scooping damage. Let's add high speed datalink capability.

Originally designed for NASA's Orion project, the 791 is qualified for manned space flight. The 791's small size and blind mate capability make it a perfect choice for 2U and 3U electronics modules. Applications include radars, weapons systems, comms gear, satellites, exoatmospheric vehicles, avionics, power distribution units, instrumentation, and everywhere else in need of a smaller, higher performance interconnect system.

- **Next-generation small form factor aerospace-grade rectangular connector**
- **Scoop-proof recessed pin contacts**
- **37 arrangements, 12 shell sizes for the ultimate in versatility**
- **Rugged aluminum alloy dual lobe shell**
- **Environmental**
- **EMI shielded**
- **Blind mating**

SERIES 791 MICRO-CRIMP

Next-generation ultraminiature rectangular

for demanding aerospace applications

SPACE GRADE
NASA
ESA, JAXA
SCREENED

SERIES
791
SEVEN
NINETY-ONE

Save Size and Weight with Series 791 Connectors

The Next Generation Ultraminiature Rectangular Connector for Demanding Aerospace and Defense Applications

About The Series 791

The Series 791 is an aerospace-grade ultraminiature rectangular connector with EMI protection and environmental sealing. Originally developed for NASA's Orion capsule, The 791 is qualified for manned space flight and is ideal for radars, weapons systems and avionics gear.

The Series 791 is available either with crimp pins or with printed circuit terminals. Machined aluminum alloy shells feature dual lobes for polarization. Contact sizes range from size 8 to size 23 in 37 arrangements. Pin contacts are recessed to prevent scooping damage while mating. Crimp contacts conform to M39029 requirements and are rear release.

An optional ground spring reduces susceptibility to EMI problems. Fluorosilicone face seals and wire grommets prevent moisture and contamination. Panel mount versions are available with an O-ring, or for improved panel bonding, a metal spring.

Board mount versions include straight or right angle terminals. Right angle PCB connectors feature an aluminum shroud covering the terminals.

Hardware options include screwlocks, jackscrews or guide pins for blind mate applications.

M-17P17 with size 16 contacts

- **Two to 102 contacts**
- **Coax, twinax, quadrax and Ochito octaxial contacts**
- **Rugged aluminum shell with dual polarizing lobes**

Shell size A – the smallest 791

- **Integral band platform for direct attachment of cable braid**
- **-65°C to +150°C**
- **Panel mount versions with O-ring or EMI spring**

- **37 contact arrangements**
- **Crimp-and-poke or epoxy-sealed board mount versions**
- **Scoop-proof recessed pins**
- **Size 23, 16, 12 and 8 contacts**

- **Straight and right angle printed circuit board mounting**
- **12 shell sizes**
- **Guide pins for blind mate modules**

- **Contacts meet SAE AS39029 requirements**
- **Internal ground spring for EMI protection**
- **Approved for manned space flight**

Dimensions in Inches (millimeters) are subject to change without notice.

Glenair

Glenair Sav-Con's protected the umbilical connectors on every Space Shuttle mission

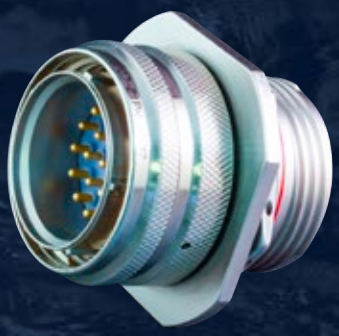
SAV-CON

SAV-CON®

Connector Savers and Bulkhead Feed-Thrus

The smart solution for preventing contact damage and extending the service life of cable assemblies and box and panel-mount receptacles

- Sav-Con®s for every Military Standard connector—circular and rectangular
- Hundreds of successful space launch and space flight applications
- Glenair Sav-Con®s on board every Space Shuttle mission flown
- Bulkhead feed-thrus for environmental, filter and hermetic applications
- Pin/pin, pin/socket, and socket/socket versions
- Traditional plug-receptacle savers, as well as in-line versions and gender changers
- Available EMI/EMP filter savers and adapters
- Optional locking mechanism



Series changers and gender changers available in both Sav-Con® and bulkhead feed-thru configurations

circular and rectangular configurations available including hermetic and EMI/RFI filter configurations

HIGH-PERFORMANCE CONNECTOR GO-BETWEENS

Sav-Con® Connector Savers and Bulkhead Feed-Thrus

SPACE GRADE
NASA
ESA, JAXA
SCREENED

Each Glenair Sav-Con® Connector Saver meets the military specification performance requirements of its mating connector. Glenair manufactures and supplies a Sav-Con® connector saver for every military standard connector currently in use including:

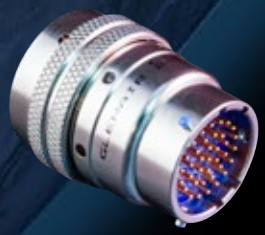
- MIL-DTL-26482 Series I and II
- MIL-DTL-28840
- MIL-DTL-38999 Series I, II and III
- MIL-DTL-83723
- LN 29729 (SJT)
- PATT 105 and PATT 602
- MIL-DTL-5015
- Series 801 and 805 Mighty Mouse
- Series 89 Nanominiature
- M24308 D-Subminiature
- MIL-DTL-83513 Micro-D Subminiature
- Series 28 HiPer-D M24308 intermateable
- Series 79 Micro-Crimp

Comprehensive materials, plating, and polarization options available

TRADITIONAL PLUG-RECEPTACLE SAV-CON® CONNECTOR SAVERS

MIL-DTL-38999 series III type

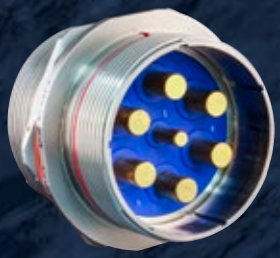
Series 89 Nanominiature rectangular



MIL-DTL-38999 series II bayonet-coupling saver

Series 80 Mighty Mouse Sav-Con®

BULKHEAD FEED-THRUS



Special high-voltage power bulkhead feed-thru

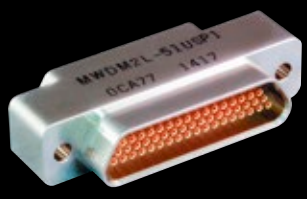
Special wide panel accommodation Mighty Mouse bulkhead feed-thru

MIL-DTL-5015 bulkhead feed-thru

Special non-cadmium plating classes

SPECIAL-PURPOSE ADAPTERS AND SAVERS

EMI/RFI filter Sav-Con® adapter (D38999 Series III type shown)



Rectangular EMI/RFI filter Sav-Con adapter (MIL-DTL-83513 type shown)

Power distribution connector savers (MIL-D-5015 type shown)

Dimensions in Inches (millimeters) are subject to change without notice.

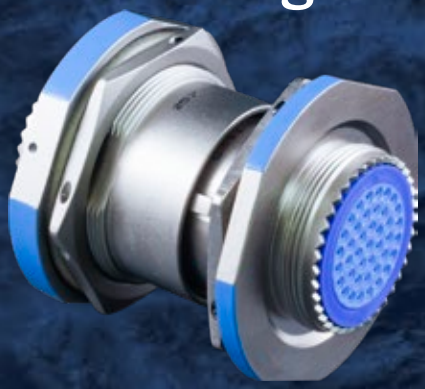
Glenair®

NASA's STEREO
(Solar TErrestrial RElations Observatory),
artist's concept

SuperNine®

Blind-Mate Connectors

Rack and Panel Sealed, Assisted Kick-off and Feed-Through Blind-Mate to D38999



Application: Glenair Series 253 connectors are designed to meet applicable environmental, electrical and mechanical performance characteristics of D38999 Series III. The technology is well suited for use in commercial blind-mate instrumentation panels, satellite deployment, scientific research and development payloads, as well as interstage, UAV, and munitions release applications.

- **Blind-mate, float mount interconnects for non-ITAR commercial as well as military/defense applications**
- **Optional assisted release (spring force) solutions to overcome pin/socket engagement force**
- **Panel-mount versions feature self-aligning float-mount technology for repeatable mating and de-mating**
- **Available in most symmetrical MIL-STD-1560 insert arrangements with contacts sizes from #23 to #12**
- **Selected materials offer low outgassing properties and high resistance to both corrosion and stress corrosion cracking**
- **Optional outgassing bake-out process available**
- **Designed to withstand the rigors of launch and flight—including shock, vibration, thermal vacuum, acceleration, and temperature extremes**
- **Standard accessory threads and teeth per MIL-DTL-38999 accommodate a wide range of backshell accessories**

Current Rating	
Size Contact	Amps
23	5
22D	5
20	7.5
16	13
12	23

Unmated Test Voltages, AC RMS, 60 Hz				
Altitude (Feet)	Service Rating M	Service Rating N	Service Rating I	Service Rating II
Sea Level	1300	1000	1800	2300
50,000	550	400	600	800
70,000	350	260	400	500
100,000	200	260	200	200

Space-grade blind-mate

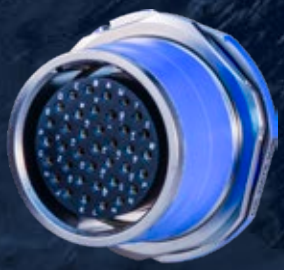
Float-mount and assisted-release connectors

SPACE GRADE
NASA
ESA, JAXA
SCREENED

CRITICAL MECHANICAL FEATURES OF BLIND-MATE CONNECTORS WITH ASSISTED SEPARATION FORCE (ASF) AND MISALIGNMENT ACCOMMODATION

Roll-off nose: allows for the smooth disconnection of a blind mate connector. Without this feature, connectors can catch or hang during mate and demate.

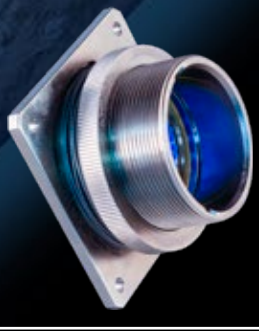
Misalignment accommodation: Radial, axial, and angular misalignment in blind-mate applications is resolved in the receptacle design with mechanical float mounting and integral wave form springs.



Sealing: Integrated misalignment accommodation makes environmental sealing difficult in blind mate circulars. Glenair SuperNine® blind-mate and assisted release connectors are available with auxiliary exterior seals.

EMI shielding: Glenair blind-mate circulars are available with auxiliary ground springs on receptacles, and ground fingers on plugs (shown), to optimize 360° shell-to-shell continuity.

Assisted separation: Spring-loaded kick-off posts are designed to overcome contact separation force (normal force) with adjustable flange-mounted springs. Separation force may be calibrated IAW application requirements and insert arrangement.



Assisted separation: Adjustment ring on receptacle shells provides reliable and repeatable calibration of assisted separation force. The adjustment ring interfaces directly with the spring-loaded kick-off posts on the plug. A set screw fitting locks the ring in place after adjustments have been made.

PRODUCT SELECTION GUIDE

Available non-ITAR rack-and-panel blind-mate and zero separation force solutions		
Basic Part No.	Description	Mates With
253-014	Float-mount plug with roll-on roll-off nose, environmental crimp contact	253-015
253-015	Float-mount receptacle with optional auxiliary seal and misalignment accommodation, environmental crimp contact	253-014
253-016	Float-mount plug with roll-on roll-off nose and spring-assisted release, environmental crimp contact	253-017
253-017	Float-mount receptacle with spring-assisted release and misalignment accommodation, environmental crimp contact	253-016
253-018	Bulkhead feed-thru with optional threaded plug or jam nut receptacle side IAW MIL-DTL-38999 Series III	253-019
253-019	Blind mate float mount jam nut receptacle with misalignment accommodation	253-018
253-033	Blind mate float mount jam nut receptacle and MIL-DTL-38999, series III feed-through with misalignment accommodation	253-018 and 38999

Also available: consult factory for specifications and how-to-order information		
Basic Part No.	Description	Mates With
253-022	Hermetic, blind mate receptacle	253-015
253-027-07	Blind mate PC tail receptacle with threaded standoff	253-015

Launch of a Japanese H-IIA rocket with the Global Precipitation Measurement (GPM) Core Observatory onboard, from the Tanegashima Space Center

SPACE-RATED

Lanyard-Release Quick-Disconnect Connectors

AS81703 space-grade lanyard release push pull mated pair with special order band and boot platform

For mission-critical disengagement and release of launch and payload systems

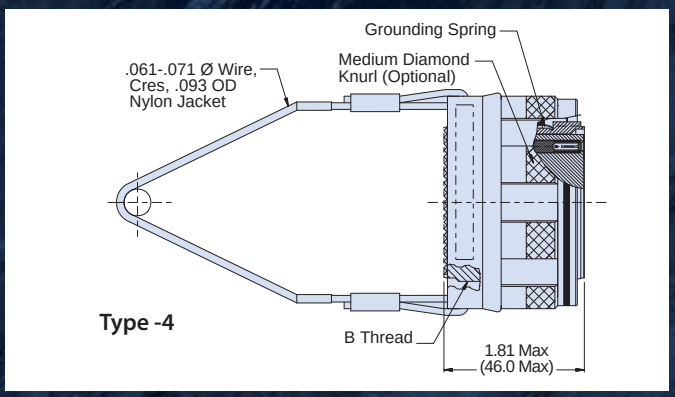
Mil-standard 1760 lanyard-release connectors were originally developed for carriage stores management applications including weapons, pods, and drop tanks. Incorporating a common electrical interface as well as interfacing signals and pin and circuit assignments, lanyard-release connectors of this type are broadly employed for reliable, jam-free mating and disengagement. Space-rated versions of 1760 class cylindrical connectors take advantage of the technology's legacy in harsh-duty aircraft applications to ensure reliable and predictable performance in space. From fail-safe application in space station and space telescope deployment to rack-and-panel research equipment interconnection, these rugged axial-pull lanyard connectors deliver proven performance in accordance with all applicable NASA, ESA, and JAXA standards. Available in a wide range of connector packaging, from MIL-DTL-38999 SuperNine® to AS81703* and special small form-factor designs, these proven-performance interconnection devices may be equipped with standard signal or power contacts as well as shielded high-speed coax, twinax, and quadrax.

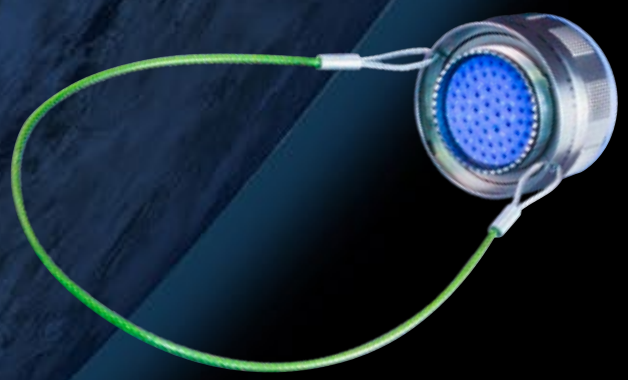
- **Jam-free, push on/pull off technology**
- **Reliable fail-safe axial pull lanyard equipped coupling**
- **Instant disengagement for critical quick-release systems**
- **Manufactured IAW MIL-STD-1760**
- **Special umbilical buffers and go-betweens also available**
- **Blind-mate rack-and-panel versions available**
- **Qualified for military and space application**
- **Outgas processing IAW NASA, ESA and JAXA**

SPACE-GRADE

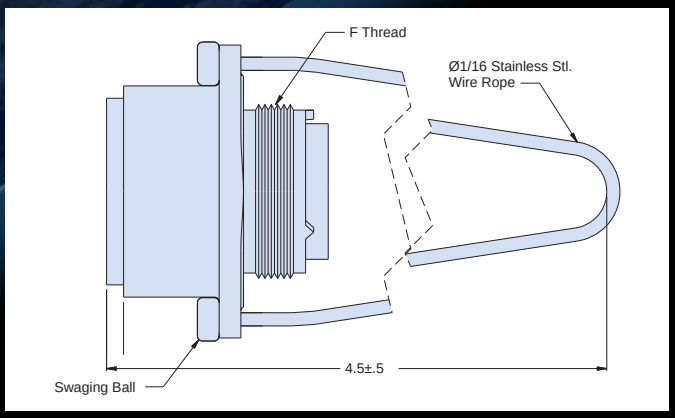
Lanyard-Release Quick-Disconnect Connectors

How To Order SuperNine® 233-216 MIL-DTL-38999 Type								
Sample Part Number	**233-216**	**-G6**	**ME**	**25-35**	**S**	**A**	**E**	**-4**
Series / Basic Part No.	**233-216** = Lanyard Release Plug							
Connector Style	**G6** = Plug with EMI Spring							
Finish	**ZL** = Cres, Electrodeposited Nickel **Z1** = Cres, Passivated **ME** = Al Alloy, Eletroless Nickel							
Size and Arrangement	Per MIL-STD-1560 plus high density							
Contact Type	**P** = Pin **S** = Socket; 500 cycles							
Alternate Key Position	**A**, **B**, **C**, **D**, **E**, **N** = Normal (Per MIL-DTL-38999 Series III)							
Lanyard Length Code	See Lanyard Length Table							
Connector Type	**4** = Type 4 (shown below, no accessory threads) **6** = Type 6 (not shown, includes accessory threads)							





How To Order 253-020 AS81703* Type Push-Pull Lanyard Release							
Sample Part Number	**253-020**	**-08**	**ME**	**25-35**	**S**	**N**	**812**
Series / Basic Part No.	**253-020** = AS81703 Type						
Connector Style	**08** = Push-Pull Layard-Release Plug						
Finish	**ZL** = Cres, Electrodeposited Nickel **Z1** = Cres, Passivated **ME** = Al Alloy, Eletroless Nickel						
Size and Arrangement	Per AS81703						
Contact Type	**P** = Pin **S** = Socket						
Alternate Key Position	**N**, **W**, **X**, **Y**, **B**, **C**						
Lanyard Ring Mod Code	**812** = Lanyard ring rotated 90° from master keyway **Omit** for standard ring						



*The MIL-C-81703 standard was superseded by SAE-AS81703 10-December 2010 per Navair

Glenair®

Dr Chiaki Mukai is a cardiovascular surgeon and JAXA astronaut, the first Japanese woman in space

CIRCULAR AND RECTANGULAR

Backshells and Connector Accessories

Corrosion resistance, weight reduction, environmental durability and design innovation

Nowhere in the world does anyone manufacture and supply such a complete selection of backshell connector accessories—for space as well as all other mission-critical applications. In addition to traditional metal materials, Glenair also manufactures an extensive line of lightweight, corrosion-free composite thermoplastic interconnect components ideally suited for systems requiring electromagnetic compatibility, long-term durability and weight reduction.

The Glenair Qwik-Clamp connector accessory shown here is used on the International Space Station. This gold plated part is extremely resistant to space corrosion and radiation and is designed with all smooth surfaces to eliminate potential damage to space suits.

QPL qualified

- **High-performance connector accessories for every environmental, mechanical and electromagnetic shielding requirements**
- **Qualified to AS85049, SSQ 21635, 21636, 22698 and 22681 and other standards and specs**
- **EMI shield termination, cable strain relief, connector protective covers and more**
- **Lightweight composite versions**
- **QPL'd AS85049 backshells**
- **Tens of thousands of popular part numbers in inventory ready for same-day shipment**

SPACE-GRADE INNOVATIONS

Circular and rectangular backshells and connector accessories

COMPOSITE DESIGN INNOVATION RADICALLY REDUCES INTERCONNECT SYSTEM WEIGHT

Band-in-a-Can composite backshell

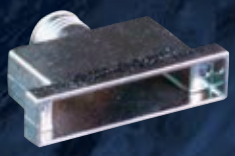
Composite Swing-Arm with keyed drop-in banding insert

All-in-one booted "Piggyback" backshell

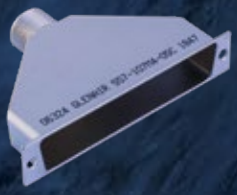
Isolated conductive ground path

SPACE-GRADE MICRO-D AND D-SUB BACKSHELLS AND ACCESSORY HARDWARE

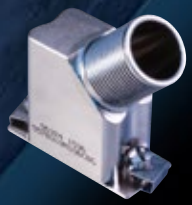
Solid shell, lightweight aluminum



Solid shell, ultra-lightweight composite



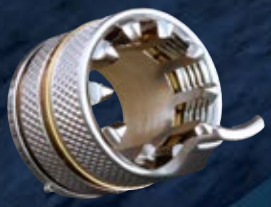
Solid shell, trapezoidal, low-profile flange, lightweight aluminum



Solid shell, standard flange, lightweight aluminum

Split shell, standard and extended shroud

BACKSHELL INNOVATION SHOWCASE



TAG-Ring/Qwik-Ty® Feed-Through Fitting

Spring-Loaded "Flop-Lid" Protective Cover

Special Space Grade Rectangular Backshell

Ultra Low-Profile Backshell

Series 437-001 Backshell "Connector Saver"

Environmental Protective Covers

Mighty Mouse composite EMI/RFI banding backshell

High-Performance Banding Backshell

Dimensions in Inches (millimeters) are subject to change without notice.

Reference Applications

Brief history of Glenair space-grade design-ins

Atmospheric Infrared Sounder (AIRS)

Glenair-built cables provide signal and power interconnection on a broad range of space applications including The **Atmospheric Infrared Sounder (AIRS)** instrument aboard the Aqua Earth-observing satellite, JPL Mars Probes, the Space Shuttle, and the AIRS satellite. Several notable space applications include:

The **Gravity Probe**, confirmed two key predictions of Einstein's general theory of relativity in 2011 by monitoring the orientations of ultra-sensitive gyroscopes relative to a distant guide star. Glenair-built cables are on board.

Gravity Probe

Titan II space-launch vehicles, with Glenair-made interconnect harnesses, propelled all twelve manned Gemini capsules.

Hermetic connectors are ideal for high-pressure/low-leakage applications in air, sea and space environments. Made of stainless steel (CRES) with glass insulators fused to the connector shell, and suitable contacts meeting a leak rate of 1 X 10^{-6} cubic centimeters of Helium per second, these mounted receptacle connectors and bulkhead feed thrus prevent gases from travelling through apertures or penetrations created for the routing of interconnect cabling. Glenair hermetics have protected a range of space programs including:

The **X-38** program implemented to design and build a spacecraft capable of flying itself and the Space Station crew back to Earth in an orbital emergency.

The X-38

Pegasus rockets, the winged space booster vehicles used in an expendable launch system developed by private industry.

MetOp-A, Europe's polar-orbiting satellite dedicated to operational meteorology.

A well designed interconnect system will include a complement of grounding and shielding technologies to insure EMC. ***EMI filter connectors*** are an effective method to achieve electro-magnetic compatibility. Glenair is extremely well versed in supplying filter connector products optimized for use in space-grade applications, providing products compliant to EEE-INST-002, Table 2G, the recognized standard for space grade filters. Glenair MIL-DTL-38999, Series 80 Mighty Mouse, Series 28 HiPer-D, and Series 79 Micro-Crimp filter connectors are currently qualified and used by Ball Aerospace, Boeing Space, NASA/JPL, Orbital Sciences, Sierra Nevada Corp., and others. Notable Glenair Filtered connector space applications include:

MetOp-A

Skynet, for the United Kingdom Ministry of Defence, to provide strategic communication services to the three branches of the British Armed Forces and to NATO forces engaged on coalition tasks.

JWST

The **James Webb Space Telescope (JWST)** is a large, infrared-optimized space telescope. JWST is designed to find the first galaxies that formed in the early Universe, connecting the Big Bang to our own Milky Way Galaxy.

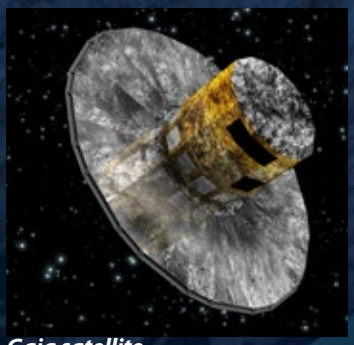
Micro-D connectors, including environmentals, hermetics, filters, and flex assemblies are commonly used in space applications for their high-performance and small size. The precision-machined shell of the Micro-D, with its robust mating retention forces, makes for an ideal connector for rocket and space vehicle applications that are subject to high levels of vibration and shock. The Micro-D is easily customized with package and mounting modification to fit virtually any integration challenge. A short list of Glenair Micro-D space applications would include the James Webb Space Telescope, SkyNet 5 military satellite, ALMA space telescope, JPL Mars Probe, Mars Curiosity Rover, AIRS satellite, and others. Several notable space applications that use Glenair Micro-D connectors include:

Skynet

The **Herschel Space Observatory**, from the European Space Agency, made several scientific discoveries in its operational phase from 2009 – 2013, including a previously unknown and unexpected step in the star formation process, and the presence of molecular oxygen in space.

Herschel Space Observatory

The European Space Agency also developed and built the **Gaia** satellite. Launched in 2013, its mission is to construct the largest and most precise map to date of the Milky Way. Its 2016 data release included positions and magnitudes for 1.1 billion stars

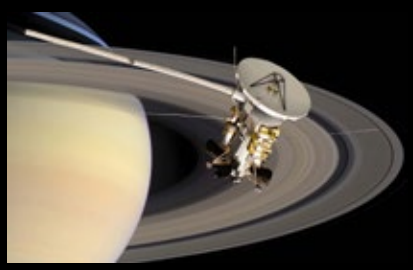


Gaia satellite

Cassini–Huygens was a joint NASA/ESA/ASI robotic spacecraft mission studying Saturn and its moons. Cassini executed several risky passes through Saturn's inner rings before completing its mission by burning up in atmospheric entry—but the data it returned will be analyzed for years to come.

CrIS is an advanced atmospheric sounding instrument aboard the United States Suomi National Polar Partnership (NPP) Polar-orbiting Operational Environmental Satellite. It produces high-resolution pressure, temperature, and moisture profiles from space, enabling more accurate predictions of severe weather events.

***Glenair M32139 Class S Nanominiature* connectors are DSCC approved for space programs. Glenair Nanominiature connectors, cable assemblies and flex circuit assemblies are currently in use on the several space-based telescopes,**



Cassini-Huygens

CrIS NPOESS Satellite

including the **Large Synoptic Survey Telescope (LSST)**, **James Webb Space Telescope**, and others.

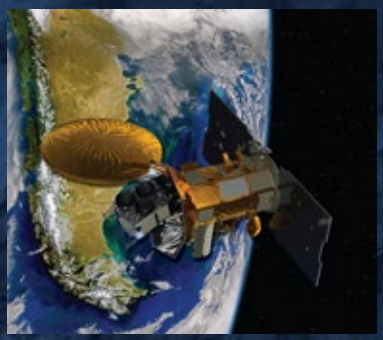
The ***Series 79*** connector is a Glenair original design. It features crimp, rear-release size #23 contacts on 0.075" spacing, as well as size #12 and #16 power and coaxial crimp contacts available in 29 insert arrangements for data and power transmission. The Series 79 Micro-Crimp is ideally suited for blind-mate rack and panel and/or module-to-chassis applications; and is currently qualified for use by Orion, Ball Aerospace, Honeywell Space, and LMCO Denver.

Glenair ***Series 80 Mighty Mouse*** connector and cable assemblies were developed as a smaller and lighter alternative to MIL-DTL-38999, offering virtually equal performance with up to 71% (weight) and 52% (size) savings for similar contact layouts. Mighty Mouse is well established in hundreds of safety-critical military, medical, industrial and geo-physical and space applications. Some space applications for this reduced form factor connector include:

NASA's **Mars Exploration Rover (MER)** Mission, an ongoing robotic mission to explore the Martian surface and geology. The Opportunity rover is continuing her winter exploration of "Perseverance Valley" on the west rim of Endeavour Crater.

A Mars Curiosity Rover "selfie"

The Mars Science Laboratory **Curiosity** landed in Mars' Gale Crater in 2012. This rover is over five times as heavy and carries over ten times the weight in scientific instruments as previous rovers. Within weeks, Curiosity discovered an ancient steambed where water once flowed, and evidence of a lake that could have supported microbial life in the distant past. Curiosity's original 2-year mission has been extended indefinitely, and it's still returning valuable data more than 5 years after landing.

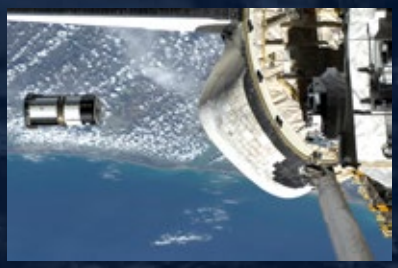


Aquarius Satellite

Aquarius was a satellite mission to measure global Sea Surface Salinity. It provided the global view of salinity variability needed for climate studies.

Glenair ***Sav-Con® Connector Savers*** protect deliverable connectors subject to repeated mating and unmating cycles, especially from repetitive qualification test cycles. Sav-Con® Connector Savers prevent costly repair or replacement of cable plugs and receptacle connectors by absorbing connect and disconnect abuse and by reducing mating cycles during testing to the absolute minimum.

A virtual "Who's Who" of space programs use Glenair Sav-Cons including Boeing Satellite Systems, the Delta IV launch vehicle, Voyager, Galileo, Magellan, Cassini, and others—both during fabrication testing and in operation.



A NASA LEO (Low Earth Orbit) Satellite

One of the most dramatic applications of our Sav-Con connectors is on the **Space Shuttle Orbiter** where they provided protection for the umbilical connectors from liftoff to touchdown on every mission.

For many space applications, the cable shield is the most important element in controlling EMI and radiation damage. Unfortunately, metal shielding—especially when applied in multiple layers—can be extremely

heavy. ***AmberStrand*** composite thermoplastic braid, and ***ArmorLite*** microfilament stainless steel braid provide robust EMI shielding at a fraction of the weight of conventional shielding. Glenair lightweight braid technologies are currently qualified for use by EADS Astrium, Honeywell Space, Orbital Sciences, and Ball Aerospace. These unique products notably served on:

The **Cassini-Huygens** Program, an international science mission to the Saturnian system.

Ariane 5

Mars Pathfinder, which delivered an instrumented lander and a free-ranging robotic rover to the surface of the red planet.

The Glenair ***Qwik-Clamp backshell*** is used on the **International Space Station.** This gold plated part is extremely resistant to space corrosion and radiation and is designed with all smooth surfaces to eliminate potential damage to space suits.

Other circular backshell and connector accessory space applications include:

The European Space Agency's **Ariane 5,** which launches satellites and other craft into geostationary transfer orbit (GTO), medium and low Earth orbits, Sun-synchronous orbits (SSO) and Earth-escape trajectories

SEA Launch was a spacecraft launch service using a mobile sea platform for equatorial launches of commercial payloads.

As with circular backshells and accessories, Glenair has the rectangular interconnect world well covered. We supply everything from miniaturized backshells for Micro-D connectors to larger rack-and-panel connector accessories. Glenair rectangular accessories are used on dozens of space programs including the International Space Station, MetOps, Herschel Space Observatory, James Webb telescope, and others.

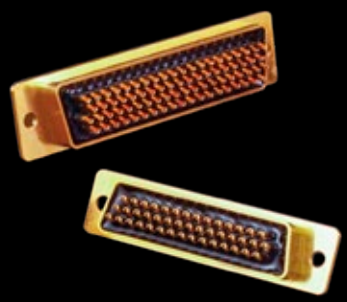
Recent / Notable Space-Grade Application Wins for Glenair

Glenair is the exclusive interconnect connector and cable supplier to the Sierra Nevada Dream Chaser reusable crewed suborbital and orbital space plane. The Dream Chaser electrical wire interconnect system incorporates Glenair Micro-D subminiature connectors, EMI filter connectors, flex circuitry, lightweight microfilament braid, metal and composite backshells, and other technologies.

The Glenair Series 28 HiPer-D High-Performance MIL-24308 Intermateable

Glenair's qualified MIL-DTL-24308 Class K space-grade hermetic, and our recently-introduced Series 28 HiPer-D connector series have become the go-to standard for mission-critical space applications and are now qualified for use by Ball Aerospace, LMCO Denver, Orbital Sciences, and others.

Space-grade Qwik-Clamp backshell designed for the International Space Station



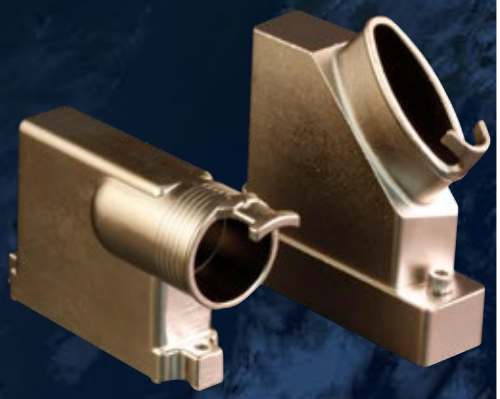
Gold-plated space-grade Series 28 HiPer-D connectors

Glenair Factory Tour

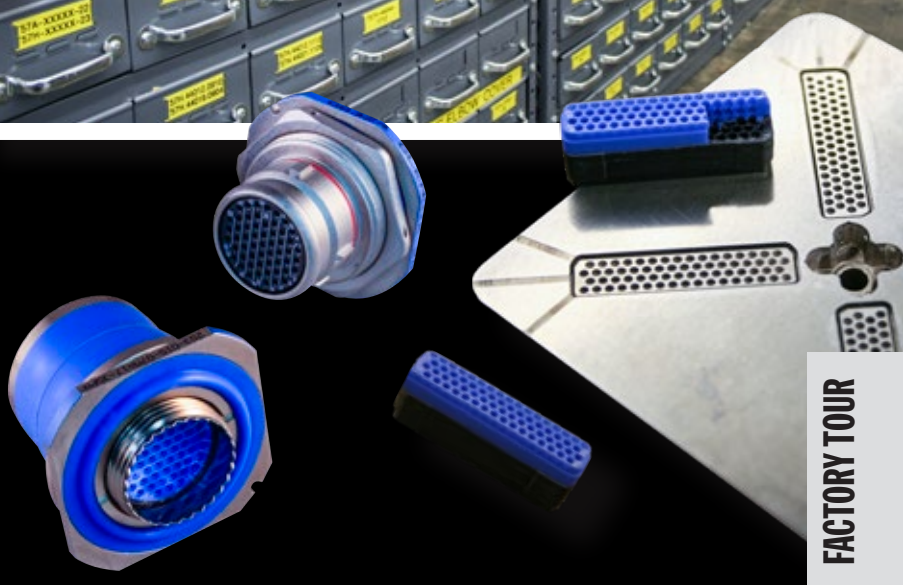
GLENDALE, CALIFORNIA

Complete vertical integration of manufacturing resources—at home in Southern California since 1956

Glenair operates the largest precision machining facility in the high-performance interconnect industry, allowing us to support both small and large-volume interconnect requirements—from one piece to 100,000



Glenair's massive investment in composite thermoplastic injection molding capabilities—the largest in the high-reliability interconnect industry—includes machinery, tooling, and most importantly, professional operators

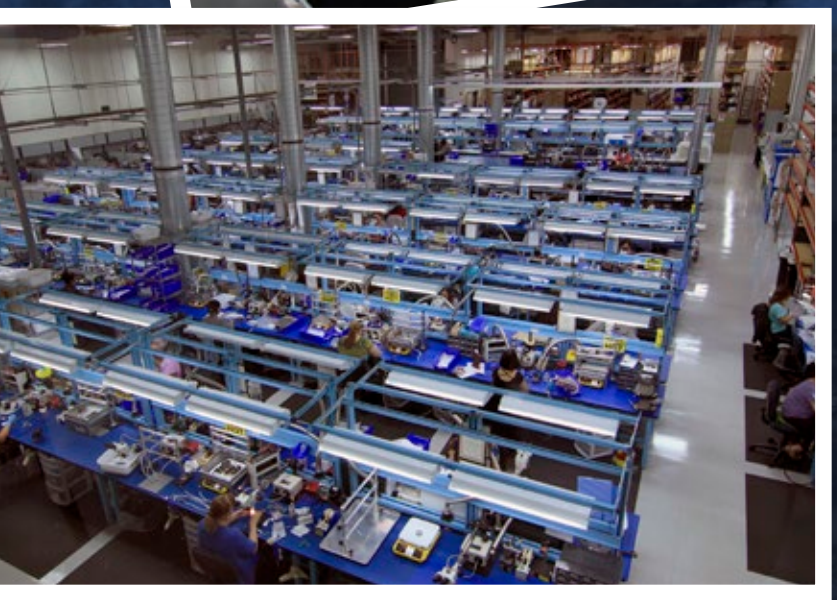


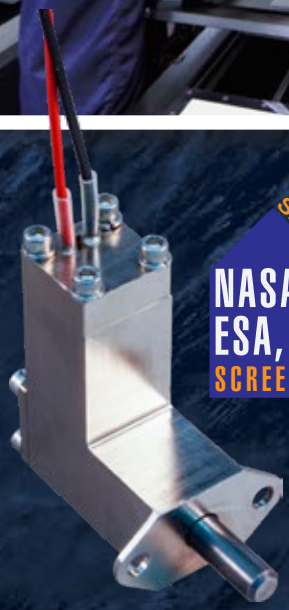
Glenair Factory Tour

GLENDALE, CALIFORNIA

Complete vertical integration of manufacturing resources—at home in Southern California since 1956

Glenair design, engineering, and fabrication capabilities extend to both electrical as well as optical connectors, cables, and complex integrated assemblies—all under one roof and one worldwide quality system





SPACE GRADE

NASA
ESA, JAXA
SCREENED

Glenair's family of space mechanisms are manufactured in certified cleanrooms. Full qualification test reports are available for every device type. NASA/ESA outgas processing and screening completed on-site. All operations are managed under a single certified quality system with unprecedented levels of performance.

But don't take it from us... take it from NASA

December 5, 2016

Good afternoon Mr. Christopher J. Toomey…and to the Glenair Family

On behalf of the NASA Launch Services Program (LSP) and the Safety and Mission Assurance Division (SMA), I would like to express sincere appreciation for the hospitality afforded our NASA team… last week. It is obvious that your company takes pride and recognizes the value in meeting and even exceeding the intents of the Aerospace Standard AS9100. We came away with a positive sense in the partnership… . You have a remarkable campus facility and a remarkable employee team there in Glendale, and I am sure, throughout your vast network of offices and facilities around the world as well. The Quality leadership has done an outstanding job implementing a working Quality Management System around your successful business model. Thank you for recognizing the importance of this particular supplier audit to NASA… , as we seek crucial information relative to the NASA Certification… .

…I would like to express some of the other very positive comments that our team came away with regarding this audit. All of your employee team should take pride in the quality of your finished product line for your customers. To that end, here is a listing of but a few of our team's observations during the audit process:

1. Welcoming hospitality to customers
2. Informative Corporate Overview Presentation
3. Positive Employee Attitudes about the workplace
4. Informative and thorough process walk-downs
5. Informative and thorough production facility walk-downs
6. Processing area cleanliness and 5S organization
7. Timely Corrective Action and effective Preventive Action plans
8. Top Management involvement and participation in the QMS – AS9100 processes
9. Expertise of the employee team members
10. …and the ability of a randomly selected employee to express the Quality Policy and what it means to him in his position with the company

A formal compilation report is in work, and should reflect the over arching positive note, which recognizes that the audit at Glenair had no Major and no Minor findings whatsoever. Please forward to any appropriate team members who have contributed to this successful audit.

Respectfully,
Paul Cloues, NASA Quality Engineer
NASA Launch Services Program
Safety and Mission Assurance, SA-D
Analysis Planning and Test (APT) Research

Glenair Factory Tour

Glenair's Complex Cable Group (CCG) has delivered creative engineering, high-quality workmanship, fast response, and on-time delivery to countless cable harness and ruggedized interconnect assembly customers customers for over 60 years—including countless space-grade and space flight applications. The operation—from cable design through fabrication, test, and delivery—is fully integrated into Glenair's Glendale campus, ISO 9001:2008 and AS9100 quality system, and high-availability business model.

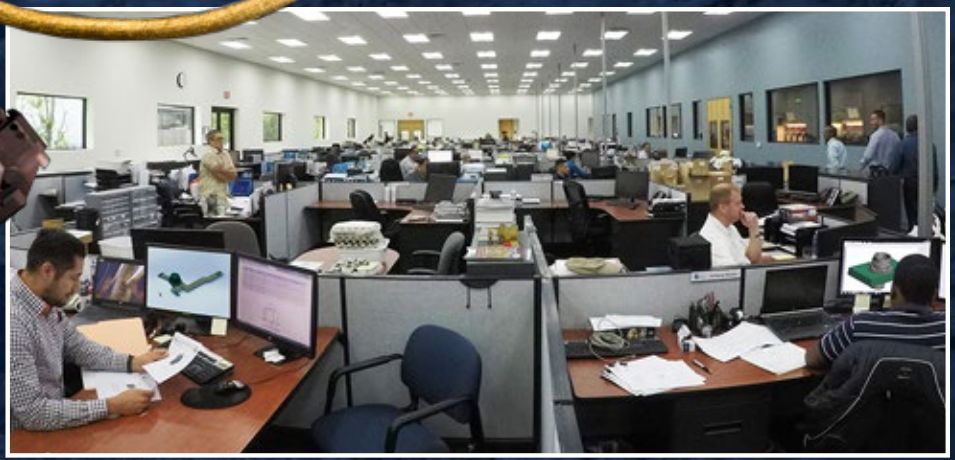
High-speed production overmolding

Multibranch assembly with lightweight ArmorLite™ microfilament EMI/RFI overbraid

Continuity testing standard on all cable circuits

Commander Ed White's "Golden Umbilical," with space-grade radiation shielding

Reliable Band-Master ATS® EMI/RFI shield termination technology used extensively throughout the shop



Glenair's engineering team in Glendale is augmented by regional teams worldwide, and we love to travel. Our place or yours? We work at our customers' convenience.

The Glenair Culture

COMMITTED TO QUALITY AND CUSTOMER SERVICE SINCE 1956

Glenair is proud of the quality and reliability we build into our broad range of mission-critical interconnect solutions—from discrete connectors to complex cable assemblies and embedded systems. Glenair is the biggest "made in the USA" interconnect supplier in the high-reliability industry, but we also operate factories in the UK, Italy, and Germany to serve the unique requirements of those markets. Glenair's Worldwide Quality System is ISO 9001 and AS9100 certified and registered. We also hold many discrete product and operations certifications for specialty, high-performance markets including space, nuclear power, and rail. In addition to world-class quality, we are laser-focused on customer service and committed to being the easiest manufacturer in our industry to do business with. Here are just some of our key customer service principles:

Lightning-fast turnarounds on quotes and special orders

Huge same-day shipment inventory

Worldwide sales and technical support in every major market

Full-spectrum, "no gap" product lines

Generous NRE, RMA, and sample request policies

Abundant engineering and technical support

No dollar or quantity minimums

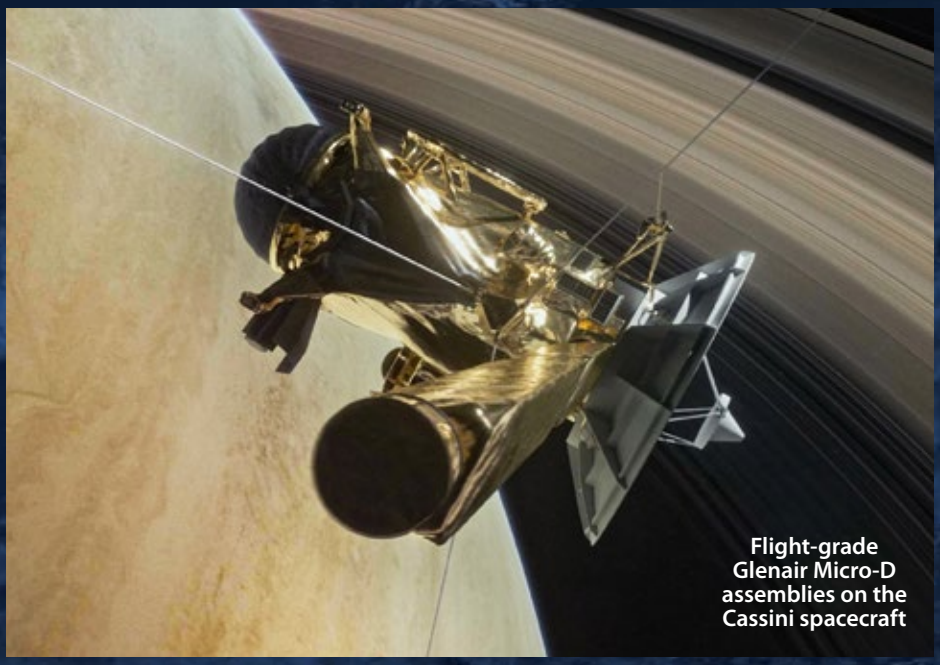
No attitudinal constraints when it comes to customer convenience and service

FACTORY TOUR

Glenair UK Factory Tour

MANSFIELD, ENGLAND

Mission-critical interconnect technologies for the UK and European markets with a special focus on micro and nanominiature flex assemblies



Flight-grade Glenair Micro-D assemblies on the Cassini spacecraft

ESCC series Micro connectors for ESA space and other UK and EU markets

Glenair UK is Glenair's Centre of Excellence for the design, build and qualification of its extensive Micro-D and Nano connector product portfolio for the European and global space market. Glenair UK have more than 30 years of experience in the manufacture of MIL-DTL-83513 Micro-D and MIL-DTL-32139 Nano compliant connectors.

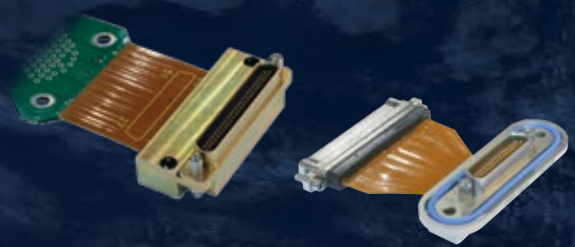
From standard flying-lead and PCB mount connectors to complex screened cable assemblies, Glenair production staff are trained and qualified to the exacting standards of IPC WHMA-A-620 and ESA soldering and crimping process standards: ECSS-Q-ST-70-08 & ECSS-Q-ST-70-26.

Certified to ISO/IEC 17025, Glenair's in-house independent test laboratory is capable of running all industry standard qualification programs for its space flight customers—from outgassing to full qualification programs (ESA and NASA).

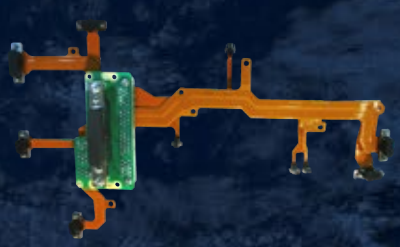
GLENAIR UK QUALITY STANDARDS AND APPROVALS

- ISO Class 8 Clean Room IAW FED STD 209E class 100,000
- Quality Management System certified according to AS9100 and ISO 9001
- Independent Test Laboratory Certified to ISO/IEC 17025 IECQ 01 and IECQ 03-6

MICRO AND NANOMINIATURE HARNESS AND FLEX ASSEMBLIES



Terminated and tested flexi and rigid flexi point-to-point assemblies with Glenair Micro and Nano interconnects



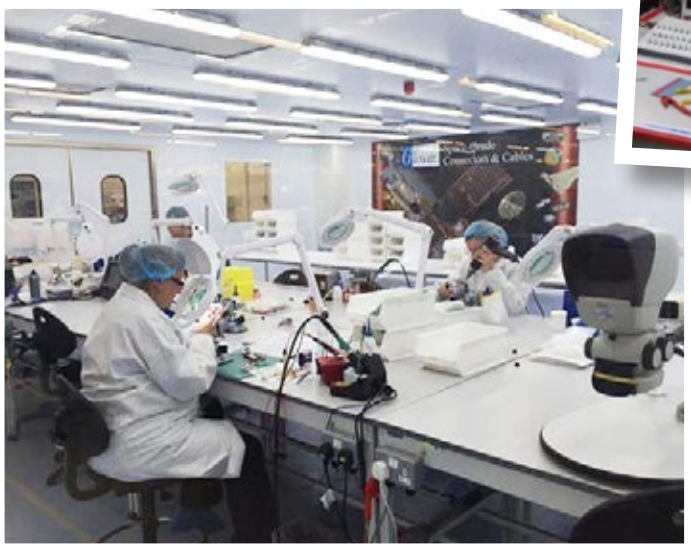
Complex multibranch flexi and rigid flexi assembly with Glenair Micro and Nano interconnects

Micro and Nano wired harnesses and pigtails

The Glenair Mansfield machine shop houses a full complement of CNC milling, turning, measurement, and mechanical inspection equipment

Micro-D and Nanominiature harnessing is completed in our AS9100 / ISO 9001 certified facility

The Glenair Mansfield clean room assembly area is used for fabrication of laser, space, and satellite assemblies IAW ISO Class 8 -100,000 PPM



Glenair UK operates an independently accredited BS9000:CECC:IECQ test lab for both internal as well as third-party product development / design verification and connector qualification

Glenair Factory Tour

BOLOGNA, ITALY

Glenair Italia serves harsh-environment military, nuclear, rail, and industrial markets with power, high-speed Ethernet, hazardous-zone interconnects and more.

SUPER ITS™ HIGH-PERFORMANCE REVERSE BAYONET

Higher temperature and ampacity rating with rigid insert and mechanical contact retention

HIGH VOLTAGE SOLUTIONS

15kV high-voltage connector series

HERMETIC CONNECTORS

UMBILICAL CONNECTORS

Umbilical interconnects, go-betweens, tilting buffers, and more

RUGGEDIZED ETHERNET CONNECTORS

Tested for compliance according to EN50173-1 standards for CAT5E and CAT7

Ethernet Cat7A contacts

Ethernet Cat5 contacts

Coax contacts

Ethernet MVB - WBT contacts

MULTIPOLE POWER CONNECTORS

Pulse Width Modulation 3kV connector for AIRBUS

Total vertical integration includes in-house contact fabrication

In-house injection molding (far left) and resilient insert processing (left) provides Glenair Italia with all the resources required to fabricate interconnect technologies from scratch without dependence on outside suppliers

In-house test lab with capabilities for both high voltage as well as high speed signal product qualification

Glenair Italia hosts the most modern and comprehensive interconnect plating facility in Europe

Glenair Factory Tour

SALEM, GERMANY

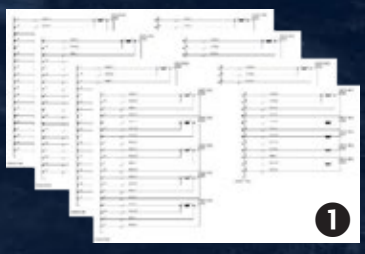
Space-grade interconnect harnesses and ESGE test rack systems for satellite applications—ESA certified

Glenair®
SPACE SYSTEMS

Glenair Space Systems: a mission-critical space-grade harness, test, production, and integration operation. ESA-certified assembly staff plus value-added Engineering Base and 3D SolidWorks design, prototyping, and clean-room facilities.

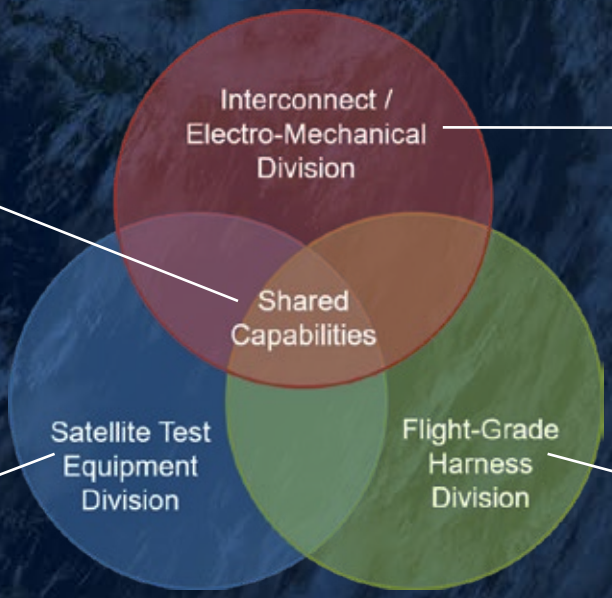
THE POWER OF GSS VALUE-ADDED ENGINEERING AND MANUFACTURING

A turnkey design and fabrication operation: from documentation (1), to prototype (2), to production (3), to integration (4).



GLENAIR SPACE SYSTEMS CORE CAPABILITIES AND TECHNICAL TEAMS

Customer-focused value-added engineering, integration and project management services leveraging CAD and Engineering Base



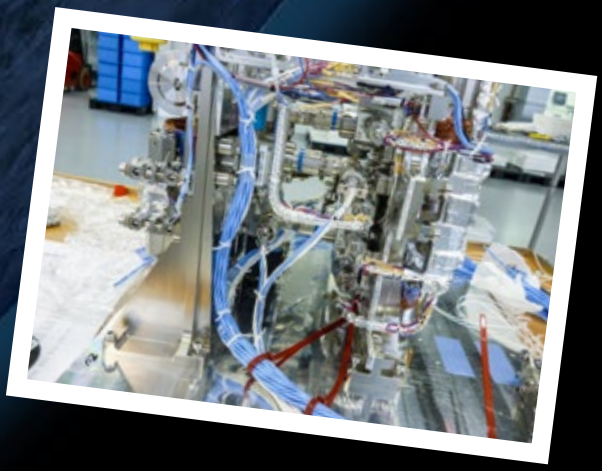
Interconnect / Electro-Mechanical Division fabricating space-grade interconnect technologies including HDRM (release nut) mechanisms

Satellite Test Division delivering turnkey Electronic Ground Support Equipment (EGSE) racks, harnesses, programming, protocols, and integration

Flight-Grade Harness division with turnkey Electrical Interface Control Document (EICD) generation, prototyping, and manufacturing

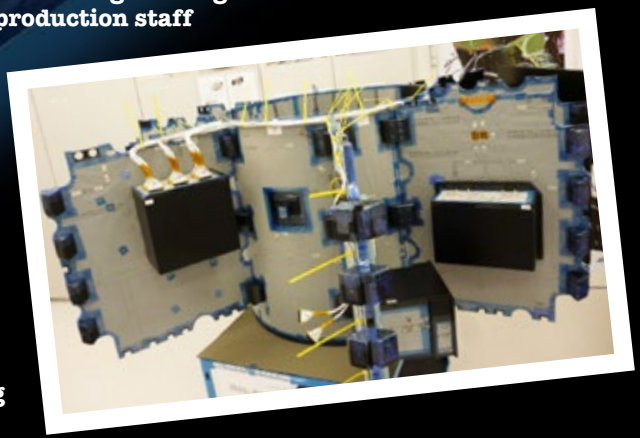
GLENAIR SPACE SYSTEMS IN-HOUSE PRODUCTION AND ASSEMBLY CAPABILITIES

Glenair Space Systems is a growing operation with an over 600 m^2 production floor. The facility also features 300 m^2 ISO 8 and ISO 6 clean rooms, ISO 5 flow chamber (certified to ESD Standard 61340-5-1), a large precision machining center, and ample clean room accommodation for large mock-up and integration projects.



Integration of production harnesses—in-house or at customer facility

ESA-certified engineering and production staff



3D mockup design, fabrication, and harness integration including in-house generation of all engineering and production files using Engineering Base

Turnkey satellite test harnesses and Electronic Ground Support Equipment racks

MISSION-CRITICAL

INTERCONNECT SOLUTIONS

Glenair, Inc.

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CAT-163

SPACE-GRADE

INTERCONNECT SOLUTIONS

RELIABILITY · AVAILABILITY · PERFORMANCE

PROVEN FLIGHT HERITAGE

SPACE-GRADE SOLUTIONS

NASA · ESA · JAXA · Commercial

Complex space-grade cable assemblies (shown: Glenair-made "Golden Umbilical")

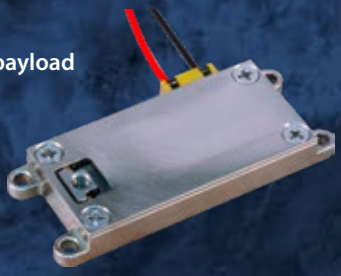
SPACE-GRADE WIRE HARNESS ASSEMBLIES

EMI/RFI shielded multibranch Micro-D connector assembly with Glenair Series 23 SuperNine® panel mount I/O connector

Multibranch Micro-D / Mighty Mouse cable assembly with ArmorLite™ lightweight EMI shield overbraiding

HOLD-DOWN RELEASE MECHANISMS (HDRMS)

Light Duty
Up to 75 lb release payload



Medium Duty
Up to 1,000 lb release payload

Heavy Duty
Up to 20,000 lb release payload

HD STACKER™

High-density (.0625" pitch) board-to-board stacking connector with solder-free press-fit (compliant pin) board mounting

LATCHING MICROSTRIPS™

Latching MicroStrips™: cable-to-cable and cable-to-board reduced size- and weight Micro-D TwistPin connectors

CERTIFIED ECSS-E-ST-50-12C SPACEWIRE CABLES

ESA, NASA, JAXA, and RKA approved SpaceWire cables for both laboratory test and space flight applications

FIBER OPTIC CONNECTORS, CABLES, AND PHOTONIC MEDIA CONVERSION

High-speed, high-bandwidth space-grade solutions

EMI/RFI FILTER CONNECTORS

MIL-DTL-38999 type, Series 80 Mighty Mouse, and other circulars

HiPer-D and Micro-Crimp filtered rectangulars

SPACE-GRADE 83513 MICRO-D AND 32139 NANO

ESA and NASA screened connectors and backshells available as discrete components or wired pigtail assemblies

SERIES 28 HIPER-D M24308 INTERMATEABLE

Qualified MIL-DTL-24308 Class K Space-Grade Hermetic, environmental, filter, Sav-Con® s and cordsets

LIGHTWEIGHT MIGHTY MOUSE AND MICRO-CRIMP

Small, lightweight, high-density ideally suited for space programs

A proven product, ideal for guidepin and rack-and-panel applications

SAV-CON® CONNECTOR SAVERS

Available for every military and commercial circular and rectangular connector series

ULTRA-LIGHTWEIGHT CONDUIT AND BRAID

Factory-terminated and user-installable conduit systems

Weight-saving microfilament EMI braided shielding solutions

ASSISTED-RELEASE, AND LANYARD QUICK-DISCONNECTS

Blind mate D38999 type feedthrough with kick-off assist

Lanyard-release quick-disconnects

SPACE-QUALIFIED HERMETIC RECEPTACLES

Glass-to-metal and CODE RED encapsulant hermetic solutions for high-pressure / low-leakage space applications

Glenair®

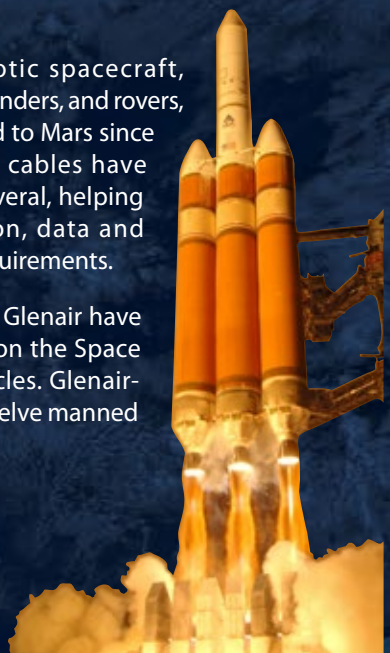
SPACE-GRADE

Complex Cable Assemblies

Commander Ed White on the first American spacewalk, 1965 with Glenair-manufactured "Golden Umbilical" cable

We like to begin our presentation of Glenair's proven-performance space-grade products with the golden umbilical life support cable used by Commander Ed White in the first American space walk in 1965. This was a complex cable assembly with an exacting set of performance requirements. Even though this application is now over 50 years old, it still reflects Glenair's design and fabrication expertise and that we have been a go-to supplier for the space industry for almost 5 decades. Today we continue to fabricate high-performance cables for space, from rugged Viton® overmolded designs to ultra-lightweight SpaceWire jumpers for the high-speed space data transmission protocol. Other notable space cable applications include:

- Dozens of robotic spacecraft, including orbiters, landers, and rovers, have been launched to Mars since the 1960s. Glenair cables have ridden along on several, helping to fulfill navigation, data and communication requirements.
- Complex interconnect cable assemblies made by Glenair have also traveled to and from orbit dozens of times on the Space Shuttle, as well as numerous space-launch vehicles. Glenair-made interconnect harnesses also served on all twelve manned Gemini capsules.

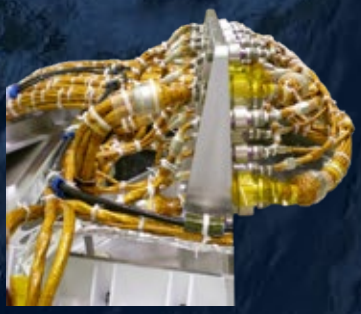


PROVEN PERFORMANCE IN SPACE

- **The "Golden Umbilical" life-support cable**
- **JPL Mars probes (orbiters, landers, and the Curiosity rover)**
- **AIRS satellite**
- **Gravity Probe mission**
- **Space Shuttle**
- **Titan II launch vehicles**
- **SpaceWire (MIL-DTL-83513)**

COMPLEX MULTIBRANCH AND OVERMOLDED CABLE ASSEMBLIES

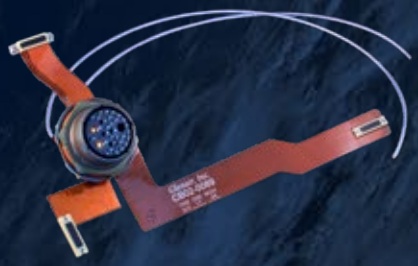
Multibranch wire harness for a space lab application



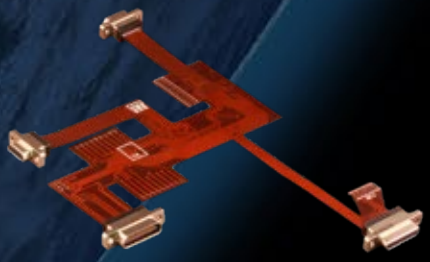
Complex Mighty Mouse cable harness for a Mars rover application

ESA and NASA screened Micro-D/Nano cable assembly

Space-grade Micro-D flex assemby with NASA EEE-INST-002 screening



Hybrid flex/rigid flex multibranch Micro-D flex assembly with discrete RF circuits



Micro-D subminiature multibranch flex assembly

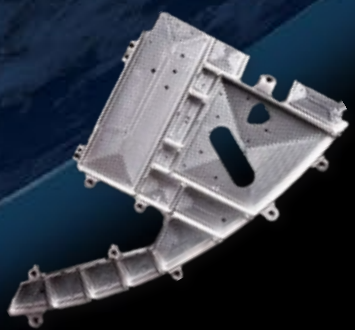
TURNKEY FACTORY-TERMINATED CONDUIT ASSEMBLIES

Complex multibranch high altitude electrical wire conduit assembly

Lightweight, halogen-free wire conduit assembly

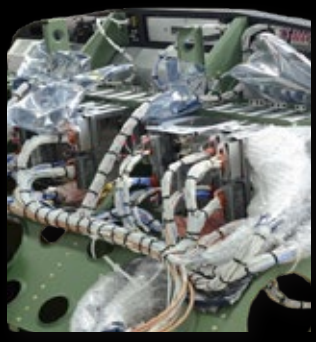
Crush-resistant aerospace metal-core conduit assembly

AEROSPACE-GRADE INTEGRATED SYSTEMS



Precision-machined, injection molded or stamped-and-formed boxes and structural members

Military-aerospace and space-grade multibranch interconnect cable assembly staff and facilities



Turnkey integrated system assemblies

Glenair®

Artist concept of NASA's Juno spacecraft, exploring Jupiter. Credit NASA/JPL-Caltech

SERIES 06 HDRM

Pyrotechnic-Free Space Mechanisms

High-reliability, non-explosive (split-spool) HDRMs, separation nuts, and pin pullers/ pushers for dependable stowage and release of deployable space systems

Glenair pyrotechnic-free release mechanisms offer quick release time, low shock, relatively low power input, and virtually no temperature sensitivity. HDRM Series includes separation nuts, pin pushers, and pin pullers—direct wired or connectorized—with a broad range of preload carrying capacity.

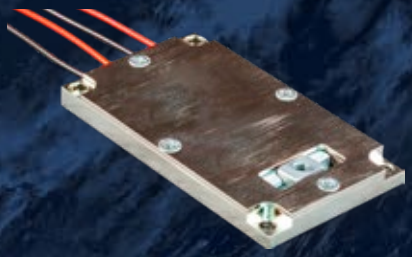
- **Pyrotechnic-free alternative (low-shock fuse-wire) for single-event release of deployable space systems—electrical initiation up to 5 amps**
- **User-serviceable and refurbishable units**
- **Redundant or non-redundant actuation circuit**
- **Not susceptible to transient and noise (EMI/ EMP/ESD/RFI) inputs**
- **Extended temperature ranges: -150°C to +150°C**

SERIES 06 HDRM

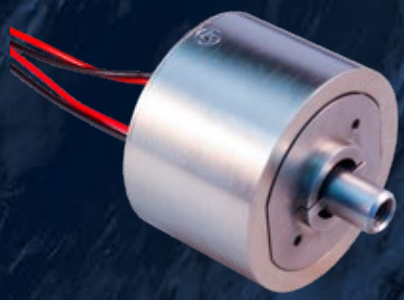
Pyrotechnic-Free Space Mechanisms

Product selection guide

HDRM DUTY CLASSES



Light-Duty HDRM
Redundant circuit,
5 – 75 lb release preload



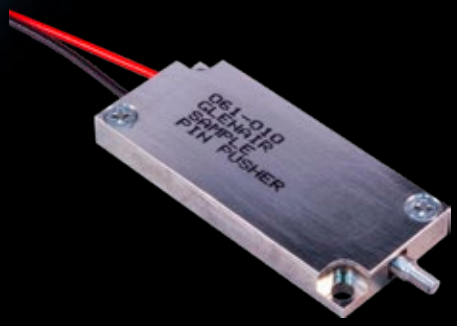
Medium-Duty HDRM
Redundant circuit,
300 – 2500 lb release preload

Heavy-Duty HDRM
Redundant circuit,
5000 – 20,000 lb release preload

HDRM RELEASE TYPES

Separation nut

Pin puller



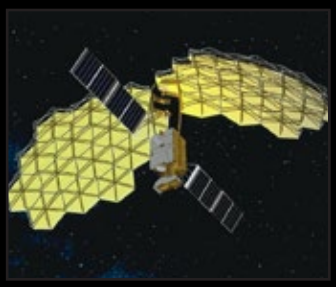
Pin pusher

DEPLOYMENT APPLICATIONS

Solar Arrays

Booms and Masts

Antennas



Reflectors

Dimensions in Inches (millimeters) are subject to change without notice.
Rev. 01.15.19

Glenair®

PhoneSat 2.5 CubeSats at
NASA Ames Research Center

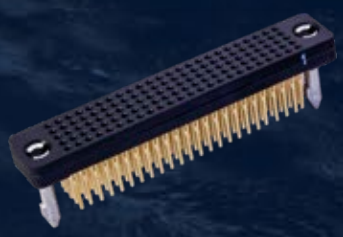
HD STACKER™

High-density, solder-free, PCIe-ready board-to-board stackable connectors

Mission-critical board-to-board connector applications demand fail-safe signal integrity as well as rugged and reliable harsh-environment performance. The HD Stacker™ brings Glenair innovation to stacking board-to-board connectors with several significant design improvements: Ultra high-density .0625" Chevron Contact System provides 55% more contacts per connector size, or a 31% size reduction for the same number of contacts as compared to current industry solutions. Polarized connector bodies and available polarized guide pins prevent accidental mismating. The solder-free press-fit compliant pin contacts are removable, repairable, and available in custom lengths. HD Stacker™ connectors may also be ordered with pre-wired cable or flex jumper terminations. High-speed signal integrity test reports are available upon request. Choose HD Stacker™ for the ultimate in high-density, rugged board-to-board stackable connector performance.

- **High-density .0625" pitch Chevron Contact System**
- **PCIe Rev 3 capable**
- **Signal integrity to 10.5Gb/sec.**
- **Polarized insulator and hardware options**
- **Solder free "eye of the needle" compliant tail for press fit installation**
- **High-temp PPS insulator meets NASA outgassing requirements**
- **Available wired / flex jumpers**
- **Available between-board spacers up to 1 inch**

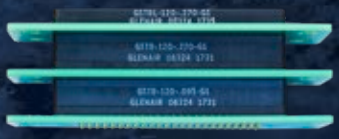
HD STACKER™ FOR MISSION-CRITICAL BOARD-TO-BOARD APPLICATIONS



Solder-free press-fit (compliant pin) board mounting

.0625" pitch contact spacing: highest available density

Polarized shells and keyed guide pin hardware prevent mis-mating



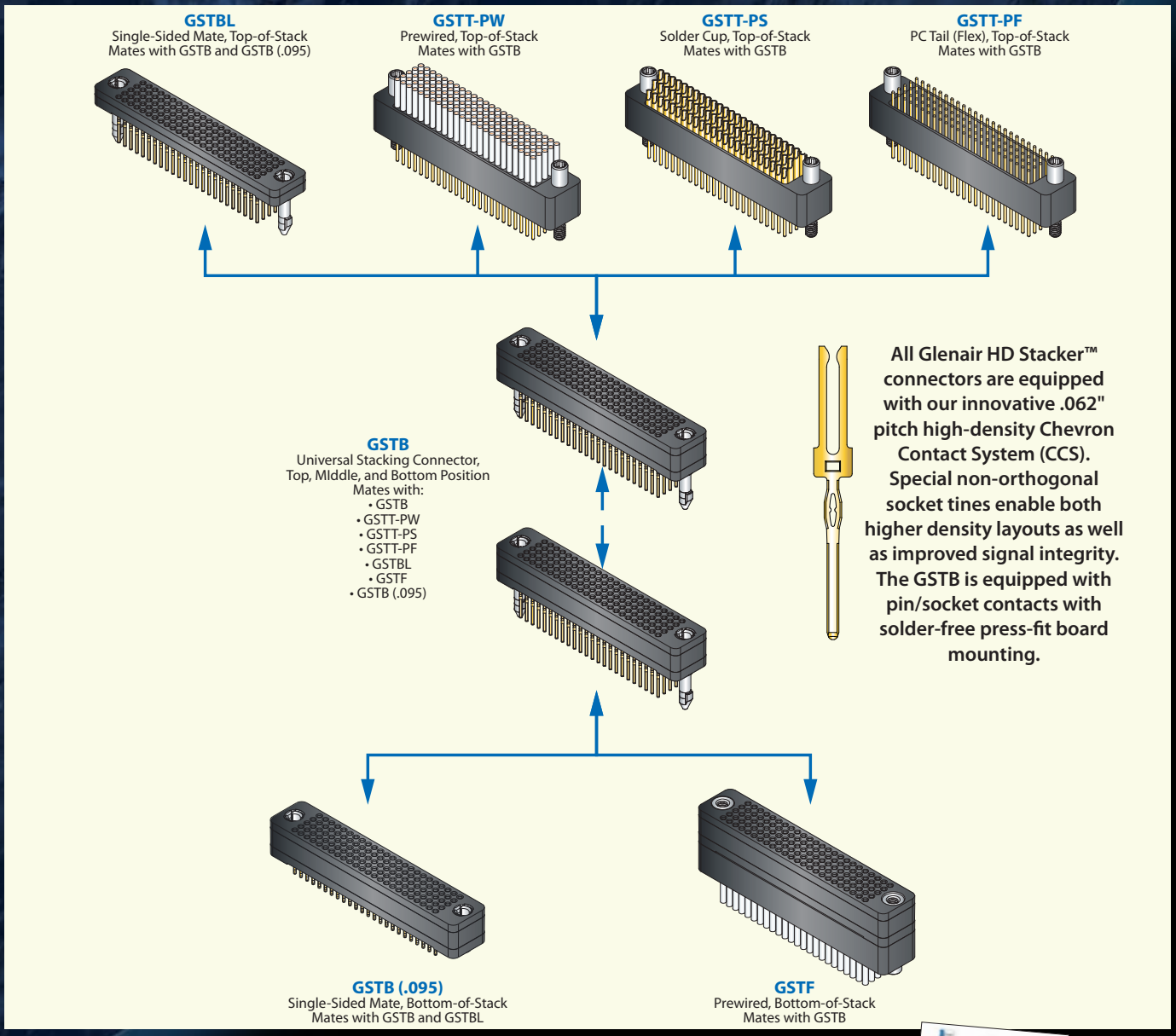
Controlled signal integrity for differential applications (PCIe Rev 3 capable)

.0625” PITCH COMPLIANT PIN

High-Density Stacker™

Rugged board-to-board stackable connectors

HD STACKER™ POSITION AND MATING COMPATIBILITY GUIDE



QUALIFICATION TESTING / HIGH-SPEED PERFORMANCE

Stacker connectors were qualified in accordance with MIL-DTL-55302G testing for:

- Contact engagement/separation
- Contact retention
- DWV
- Electrical resistance
- Mechanical vibration and shock
- Insulation resistance
- Thermal shock
- Contact resistance
- Humidity

High-frequency electrical performace tests were performed for: Insertion loss, return loss, crosstalk, and time domain performance metrics including impedance and eye pattern. Complete test reports are available at **www.Glenair.com/technical_information_test_reports**

Glenair®

A PhoneSat 2.5 CubeSat, built at NASA's Ames Research Center

SERIES 171

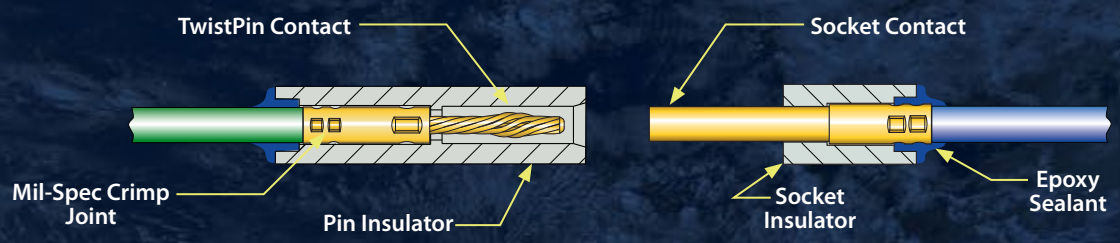
Latching MicroStrips™

TwistPin performance and durability in an economical, space-saving single row package

Series 171 MicroStrips™ are made for high-reliability wire-to-board and wire-to-wire applications. These high-density strip connectors are typically used in ruggedized 3 Amp signal applications, where higher-performance contacts, precision machined shells and space-grade dielectrics offer significant advantages compared to commercial-grade headers and jumpers. Glenair's rugged, high force TwistPin contact accepts up to #24 gage wire, the current rating is 3 Amps, the voltage rating is 600 Vac, and the temperature rating is -55C to +150C. The Series 171 Latching MicroStrip connector meets all applicable requirements of MIL-DTL-83513. Choose solder cup, pre-wired, or printed circuit board versions. A stainless steel latch provides secure coupling.

- **High-reliability TwistPin contact system**
- **#24-30 AWG wire size**
- **.050" pitch contact spacing**
- **Solder cup, pre-wired or PCB header terminations**
- **3 Amps, +150C, 600 Vac**

LATCHING MICROSTRIP™ CROSS-SECTIONAL VIEW



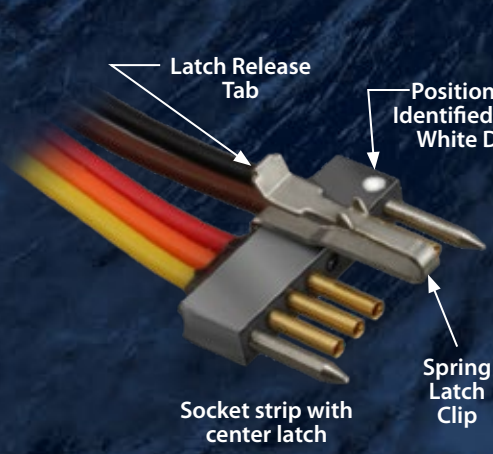
SERIES 171

Latching MicroStrips™

Superior TwistPin contact performance

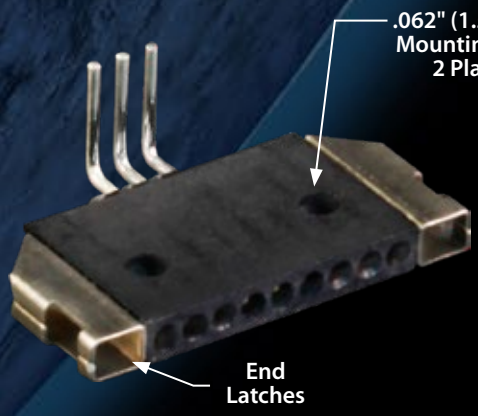
ABOUT SPRING LATCHES, GUIDE PINS AND MOUNTING HOLES

Optional stainless steel latch clips provide secure mating when subjected to shock and vibration. A single center latch is suitable for most applications. Dual end latches are also available. The spring latch is always installed on the socket strip. The latch receiver is installed on the pin strip. To unmate the connectors, simply press the release tab while pulling the connectors apart. MicroStrips™ are available with stainless steel guide pins. A single guide pin provides circuit polarization. A guide pin on each end helps to align connectors when mating and prevents damage to contacts. For most applications the preferred configuration is a single center latch with no guide pins. Mounting holes are now available. Attach strips to circuit boards with size 0-80 screws (customer-supplied).



Socket strip with center latch

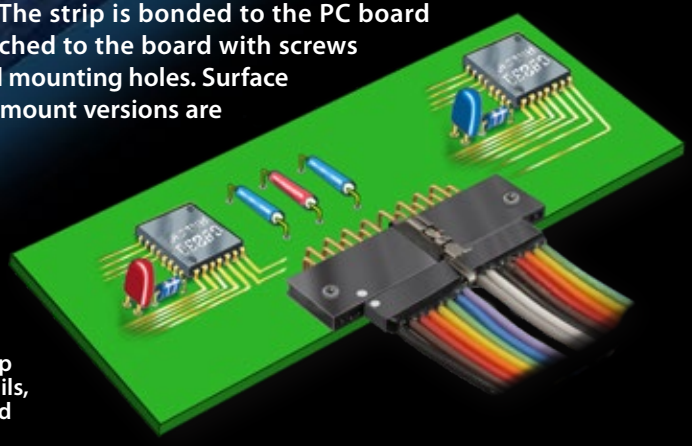
Pin strip with center latch and guide pins at both ends



Right Angle PCB Header with End Latches and Mounting Holes.

ABOUT BOARD MOUNT STRIPS

Space customers typically use MicroStrips™ for high reliability board-to-wire I/O applications. The pin strip is usually configured with right angle thru-hole PC tails. The strip is bonded to the PC board with epoxy, or attached to the board with screws installed in optional mounting holes. Surface mount and vertical mount versions are also available.



Right angle pin strip with staggered PC tails, mounting holes and center latch

SINGLE ROW BACK-TO-BACK MICROSTRIPS

.050" pitch single row surface mount back-to-back microstrip

Dimensions in Inches (millimeters) are subject to change without notice.

Physical layer SpaceWire router aboard the James Webb Space Telescope (NASA)

SpaceWire Cable Assemblies

Flight- and lab-grade SpaceWire qualified cable assemblies for IEEE 1355 space network node interconnection of routers, switches, recorders, transceivers, and other physical layer devices

The success of any space mission begins with reliable data transmission and Glenair Spacewire cables, built to meet the strict standards set forth by ECSS-E-ST-50-12C make this a reality. Our Spacewire cables offer bidirectional, high speed data transmission rates up to 400 Mbits/s while significantly reducing cross talk, skew, and signal attenuation. By incorporating a serial, point-to-point cable, with low voltage differential signaling (LVDS) reduced costs are realized through an easily integrated data transmission cable. These features allow Spacewire cables to be incorporated across various satellite data transmission programs without the expense of costly design customization.

Glenair Spacewire assemblies begin with a high performance cable built with expanded polytetraflouroethylene (ePTFE) insulation. This material allows for low-loss transmission of LVDS signals, maximizing data-rates while allowing for the implementation of standard hardware protocols, thus eliminating the need for design customization and long lead time cable projects.

TYPICAL USES INCLUDE

- EGSE applications
- Radar sensor systems
- Hi-resolution camera equipment
- Sensor, mass-memory unit, and telemetry subsystem interconnections

APPROVED FOR USE BY:

- ESA
- NASA
- JAXA
- RKA

CONNECTOR/CABLE

- **Laboratory and space-grade versions available**
- **Qualified MIL-DTL-83513 Micro-D connectors**
- **Gold-plated copper alloy TwistPin contacts**
- **Basic cable, 4 twisted pair cables and a ground**
- **Epoxy resin potting**
- **EMI banding backshell**

PERFORMANCE

- **3 Amps**
- **Temperature tolerance -200° to 180° C**
- **100 Ω impedance shielded signal pair**
- **Very low skew, signal attenuation and crosstalk**
- **65dB minimum attenuation shielding effectiveness**
- **Low magnetic permeability IAW EIA-364-54**

POINT-TO-POINT AND SINGLE-ENDED

SpaceWire cable assemblies

Technical specifications / how-to-order

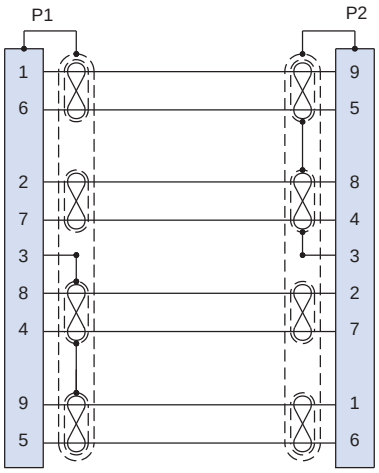
NOTES:

1. Flight grade (cable Type F) assemblies to be screened IAW NASA EEE-INST-002, Table 2. Level 1 with 100% thermal vacuum outgassing (24 hours/+125°C/10^{-6} torr). Reference Glenair Mod Code 429C.
2. Operating temperature - 200°C to +180°C. Reference Glenair Mod Code 428.
3. Electrical performance:
   Dielectric withstanding voltage: 600 VAC.
   Insulation resistance: 5000 megohms @500 VDC.
4. Assembly to be identified with Glenair's name, Part Number, Cage Code and Date Code or ESCC Component Part Marking Standards.

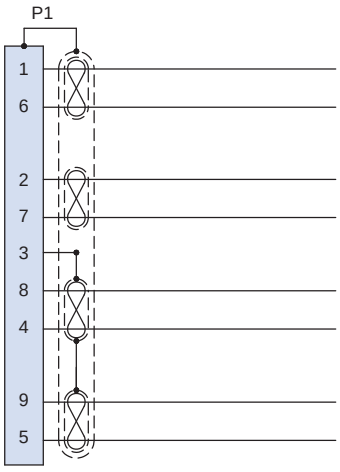
MATERIALS/FINISH:

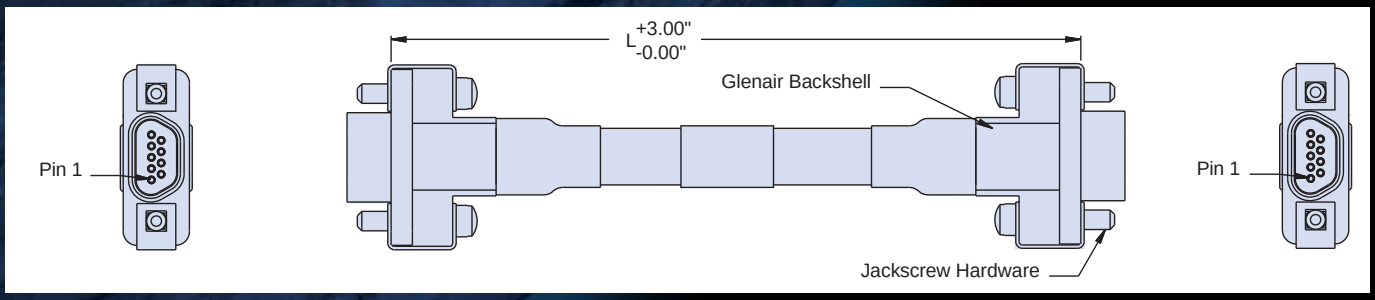
- Shells/backshells - aluminum alloy/electroless nickel.
- Insulators - high grade rigid dielectric/N.A.
- Contacts - copper alloy, gold plated.
- Hardware - stainless steel/passivated.

Back To Back Wiring
Diagram (GP)



Single Ended Wiring
Diagram (P)





How To Order Spacewire											
Sample Part Number	**GSWM**	**2**	**L**	**-9**	**GP**	**-6**	**F**	**B**	**-16**	**S**
Product Series	**GSWM**–Glenair Spacewire Micro-D									
Shell Plating	**2**–Electroless Nickel **5**–Gold									
Insulator Material	**L**–LCP									
Shell Size	**-9**									
Connector Type	**P**–Single Ended Pin (Plug) **GP**–Pin (Plug) Connector Both Ends									
Wire Gauge	**-6**–26 AWG **-8**–28 AWG **-0**–30 AWG (30 AWG–Lab Only)									
Cable Type	**F**–Flight Grade **L**–Lab Grade									
Termination Option	**B**–Backshell									
Cable Length In Inches	**-16** = 16 inches (12 inches minimum)									
Hardware	**S**–Male Slotted Jackscrew **P**–Female Jackpost									

ESA's TV-4 Albert Einstein Automated Transfer Vehicle approaching the Zvezda Service Module of the ISS

Glenair High Density GHD fiber optic connection system features integrated alignment sleeve retainers and #18 keyed and non-keyed termini types for singlemode and multimode F/O applications

FIBER OPTICS

High-performance fiber optic connectors, cables, termini, and assemblies

Glenair high performance fiber optic interconnect systems have been successfully deployed in hundreds of commercial and military aerospace applications

GLENAIR INNOVATIVE FIBER OPTIC CONNECTOR BACKSHELLS

Special-purpose fiber optic accessories, available exclusively from Glenair, optimize termini axial alignment and prevent bend radius damage

ABOUT GLENAIR GHD

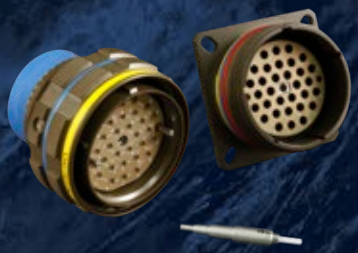
- **Innovative #18 (1.25mm ferrule) front-release genderless termini accommodate 900µ to 2.0mm jacketed fiber**
- **M85045/16 cable accommodation**
- **Composite, aluminum and stainless steel shells available**
- **Single keying for APC polish available**
- **Better optical performance than D38999 with nearly double the density**
- **Precision alignment sleeve retainer with integrated guide pins**
- **Piston O-ring sealing—submersible design**

GLENAIR BUTT-JOINT FIBER OPTIC INTERCONNECT SOLUTIONS

MIL-DTL-38999 type fiber optic

Glenair High Density (GHD) fiber optic

Glenair Front Release (GFR) fiber optic



ARINC 801 type fiber optic

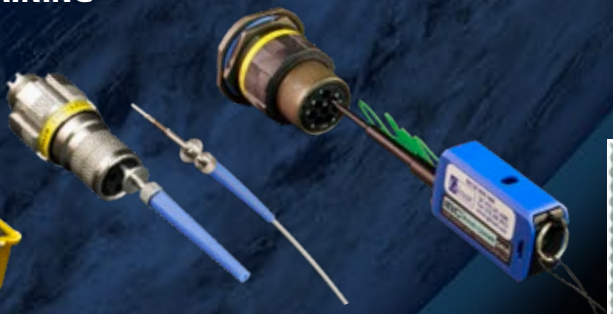
MT Ferrule 38999 type fiber optic

NGCON MIL-PRF-64266 fiber optics

Fiber optic Sav-Con® connector savers

TOOL KITS AND TRAINING

Fiber Optic termination and maintenance kits



Fiber optic test probes and adapters

Dry-wipe fiber optic cleaning tools

On-site fiber optic technician certification training

TURNKEY FIBER OPTIC BREAKOUT CABLES AND RUGGEDIZED ASSEMBLIES

Glenair High Density (GHD) fiber optic assembly

Glenair hybrid optical/electrical assembly with ST transceiver/receiver terminations

Demo assembly illustrating MT fiber optic board terminations

Rugged MIL-DTL-38999 Series III fiber optic assembly

ESA astronaut Paolo Nespoli works with Anomalous Long Term Effects on Astronauts (ALTEA-Shield) equipment in the ISS

Photonic contacts and connectors

In-line fiber optic to copper media converter

RUGGEDIZED

Photonic Interconnect Solutions

Unlock the huge bandwidth of optical fiber and dramatically reduce the size and weight of transceiver hardware

Glenair leverages its extensive portfolio of military and aerospace interconnect products to bring you ruggedized Photonic solutions, converting signals between the electrical domain and the fiber domain. These Photonic products are designed for harsh military/aerospace system and subsystem environments and will operate reliably over very wide temperature ranges and high shock and vibration conditions; they have been optimized to minimize size, weight and power and offer electrical-to-fiber conversion for Ethernet, video, signal aggregation and high-speed digital signals. Glenair also offers integration of electronics or Photonics into rugged connector packages and cable assemblies per specific customer requirements. We offer rapid response in-house electrical/PCB design, and mechanical connector/backshell engineering from our vertically intergrated factory.

Small form-factor transceiver

Signal aggregation media converter

7-port Ethernet switch

DVI video media converter

ADVANTAGES OF GLENAIR PHOTONICS

- **Reduced size, weight, and power consumption**
- **Leverages the virtues of fiber optics: EMI immunity, network security, increased transmission distance and high bandwidth**
- **High shock and vibration to support mil/aero applications**
- **Wide operating temperature range: -40°C to +85°C and beyond**
- **Designed IAW military and aviation requirements: ARINC 818, MIL-STD-883, MIL-STD-461, DO-160 and others**
- **Install Photonics in a fiber optic backbone for future requirement expandability without re-cabling**

SERIES 050 OVERVIEW

Ruggedized, Small Form-Factor Photonic Interconnect Solutions

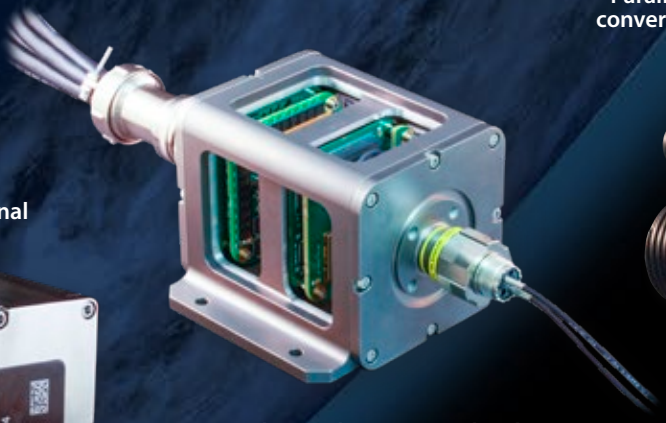
ONGOING EVOLUTIONS IN PHOTONIC TECHNOLOGY

RF-over-fiber for SATCOM-based WiFi and IFE systems

PCB-mount dual Transmitters, Receivers, and Transceivers

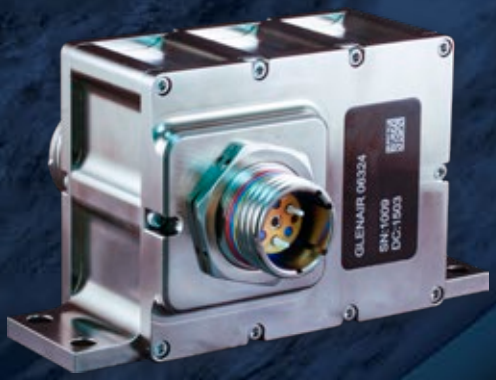
Parallel optical PCB-mount photonic converter with special heat-sink design

Small form-factor bi-directional PCB-mount transceivers

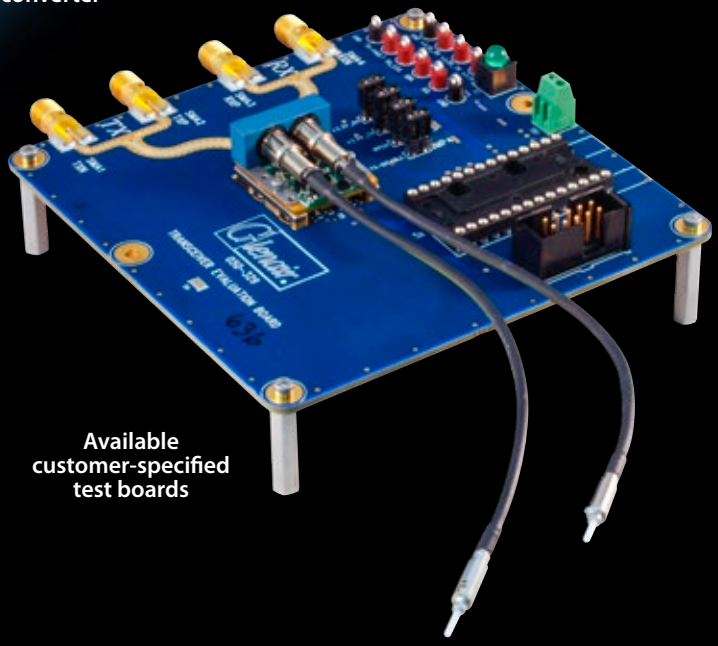


Cutaway shows Glenair ruggedized electronics in a signal aggregation media converter

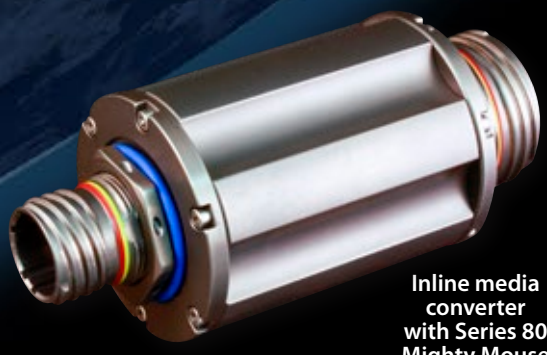
DVI copper-to-fiber media converter



Lightning-strike protected ARINC 801 F/O to D38999-type media converter



Available customer-specified test boards



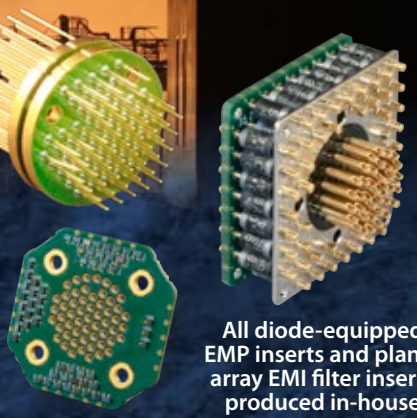
Inline media converter with Series 80 Mighty Mouse and SuperNine connectors

Dimensions in Inches (millimeters) are subject to change without notice.

Launching ESA's MetOp-B weather satellite

SERIES 240

EMI/EMP Filter Connectors



All diode-equipped EMP inserts and planar array EMI filter inserts produced in-house

Glenair manufactures a full range of filter connectors for use in EMC/EMP management of electronic systems and interconnect cabling. All connectors are designed in accordance with applicable connector specifications, and are designed to mate with plugs with the same insert configuration and opposite contact gender. Planar filter arrays and TVS diodes may be integrated into both standard catalog as well as build-to-order configurations. Glenair's state-of-the-art diode burn-in process tests leaded and surface mount diodes with leakage current monitored throughout the entire test procedure ensuring field reliability.

Table I: Capacitor Array Code / Capacitance Range

Class	Pi - Circuit (pF)	C - Circuit (pF)
X	160,000 - 240,000	80,000 - 120,000
Y	80,000 - 120,000	40,000 - 60,000
Z	60,000 - 90,000	30,000 - 45,000
A	38,000 - 56,000	19,000 - 28,000
B	32,000 - 45,000	16,000 - 22,500
C	18,000 - 33,000	9,000 - 16,500
D	8,000 - 12,000	4,000 - 6,000
E	3,300 - 5,000	1,650 - 2,500
F	800 - 1,300	400 - 650
G	400 - 600	200 - 300
J	70-120	35-60

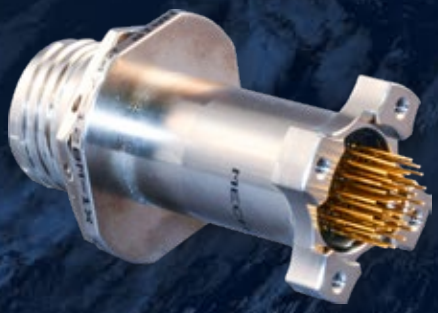
ARINC 600 size 2 filter connector. Glenair also manufactures narrow-profile size 1 and double-wide size 3. All configurations are environmentally sealed for rugged airframe applications.

- **Planar, multilayer ceramic capacitive filters, with and without transient voltage suppression diodes**
- **C and Pi electrical configurations**
- **PC tail, crimp or solder cup termination**
- **35 – 240,000 pF capacitance**
- **Fast and reliable diode burn-in and test services**
- **Turnkey in-house manufacturing of all filter connector elements and processes**

SERIES 240

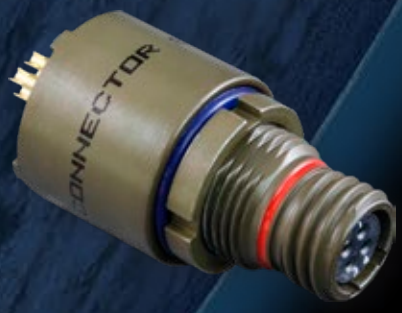
EMI/EMP Filter connectors

Innovative desigins · total vertical integration



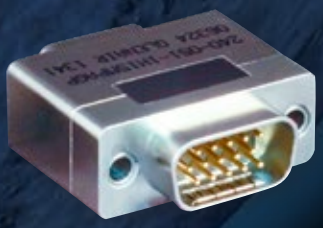
Extended-shell
PC-tail cylindrical with
threaded standoff

Special-purpose
filter connector cable
adapter

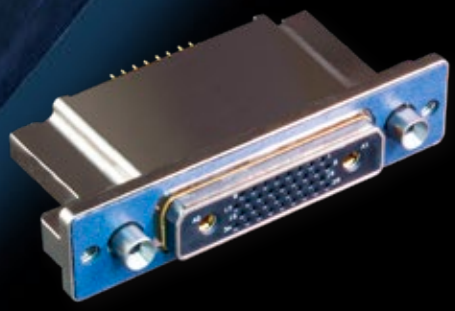


Series 80 Mighty Mouse
PC-tail filter receptacle

MIL-DTL-83513 type
micro-D filter connector



MIL-DTL-24308 type
D-sub filter connector



Series 79 Micro-Crimp
filter connector

MIL-STD-1760 filtered
umbilical connector

Filter plug with
crimp contacts

MIL-DTL-38999 series III type
EMP transient-voltage diode-
equipped connector

Glenair®

JAXA Kibo Laboratory module from the International Space Station

Certified SpaceWire cables for both laboratory/test applications and flight applications

SPACE GRADE
NASA
ESA, JAXA
SCREENED

SERIES MWDM

Micro-D Connectors

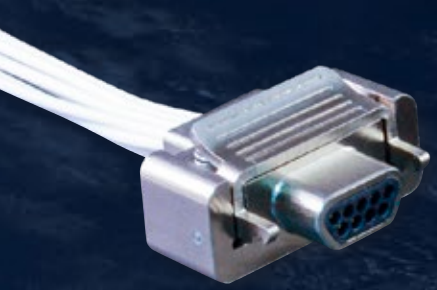
Standard

Hermetic

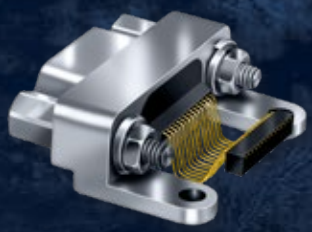
EMI Filter

- High density Micro TwistPin contacts set on .050" centers
- 9 to 130 contact arrangements
- Pigtail, PCB, solder cup, and flex terminations
- Single row, multi-row, low profile and high density insert arrangements
- QPL and commercial versions
- Same-day availability on all part numbers
- Qualified for use in ESA, NASA, JAXA applications

TwistPin equipped MIL-DTL-83513 Micro-D connectors offer outstanding mating performance, durability and minimal contact resistance

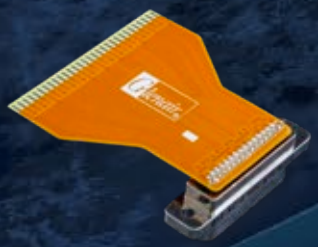


MasterLatch™



Surface Mount

Rear Panel Mount



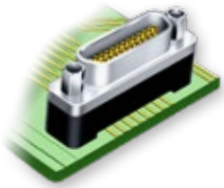
Flex Circuit

MIL-DTL-83513 AND COMMERCIAL

Micro-D Connectors

Mission-critical mating performance

Metal Shell Micro-D for Harnessing Applications					
					
GRPM Solder Cup	GRPM Insulated Wire	GRPM Uninsulated Wire	MWDM Solder Cup	MWDM Insulated Wire	MWDM Back-To-Backs
					
Shielded Cable Assembly	MWDM Uninsulated Wire	GMDR Insulated Wire	GMDE Environmental	GSWM SpaceWire	GMLM MasterLatch

Micro-Ds for Printed Circuit Board			
			
GRPM-CBS	GRPM-CBR	MWDM-BS	MWDM-BR
			
MWDM-CBR	MWDM-CBS	90° Surface Mount	GMR7580
			
GMR7590	GMR7580C	GMR7590C	Right Angle Filter

WellMaster™ 260

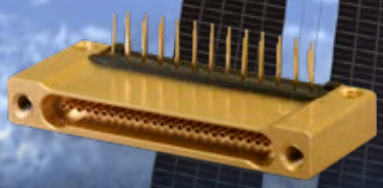
Sav-Con®

Latching MicroStrip

Low Profile

Dimensions in Inches (millimeters) are subject to change without notice.

The International Space Station



SERIES 89

Nanominiature Connectors

MIL-DTL-32139 qualified connectors for mission-critical board-to-wire applications—simply the smallest and lightest mil-spec connector in the business

- 1 Amp current rating
- .025 Inch (0.64 mm) contact spacing
- #30 And #32 gage wire accommodation
- Single and double row
- Metal shell, aluminum, titanium or stainless steel
- TwistPin contact system
- Gold alloy contact, unplated
- Thru-hole and surface-mount PCB versions

THE NANO TWISTPIN ADVANTAGE

Transverse cross-section of a TwistPin contact crimped to solid wire

- Gas-Tight Crimp Joint
- Better Shock and Vibration Performance
- Corrosion Proof Contact Alloy

SERIES 89

Nanominiature Connectors

The smallest and lightest mil-spec connector

Series 89 Nanominiature Connector Performance Summary	
Contact Spacing	.025" (0.64mm) Contact Centers
Wire Accommodation	#30-#32 AWG
Current Rating	1 AMP Max
DWV	250 VAC RMS Sea Level
Insulation Resistance	5000 Megohms Minimum
Operating Temperature	-55° C. to +125° C.
Contact Resistance	71 Millivolt Drop Maximum
Shock, Vibration	100g's, 20 g's
Durability	200 Mating Cycles
Corrosion Resistance	48 Hours Salt Spray
Mating Force	5 Ounce Max, 0.4 Ounce Min

How Small Are They?

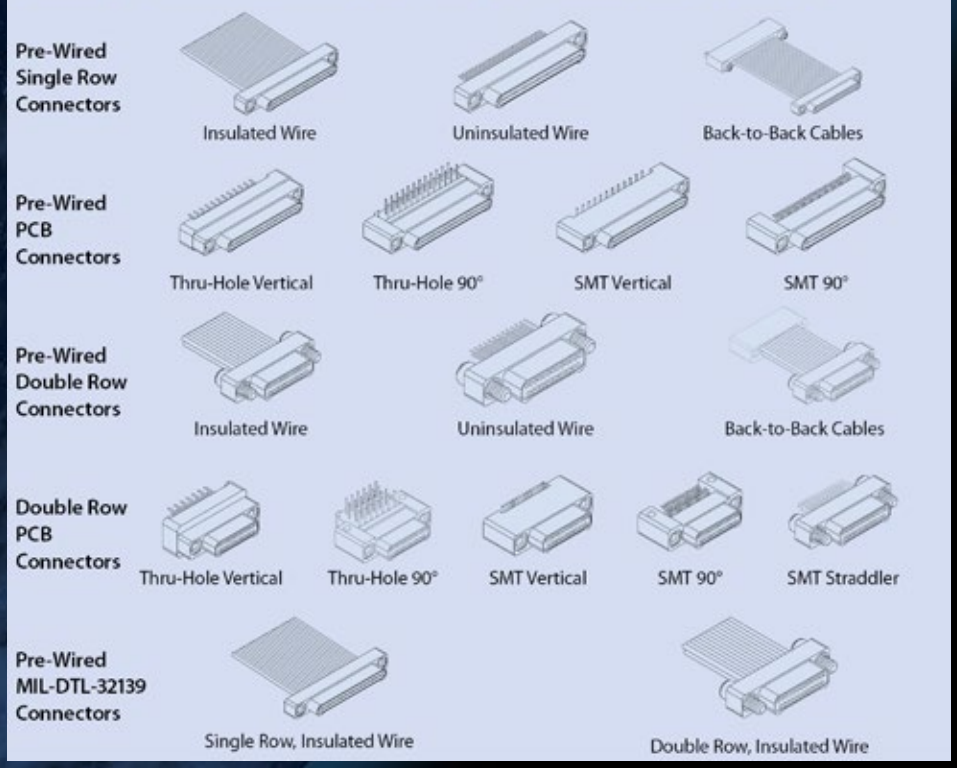
D-Subminiature Connector
25 Contacts
on 0.109 Inch Spacing

Micro-D Connector
25 Contacts
on 0.050 Inch Spacing

Nano Connector
25 Contacts
on 0.025 Inch Spacing

Also available: space-grade Nano circulars

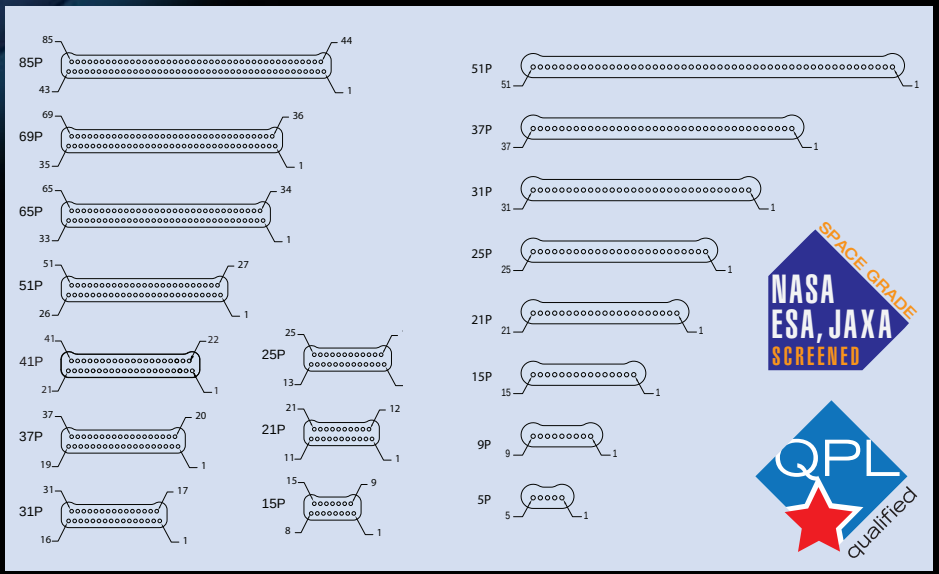
SERIES 89 NANOMINIATURE PRODUCT SELECTION GUIDE



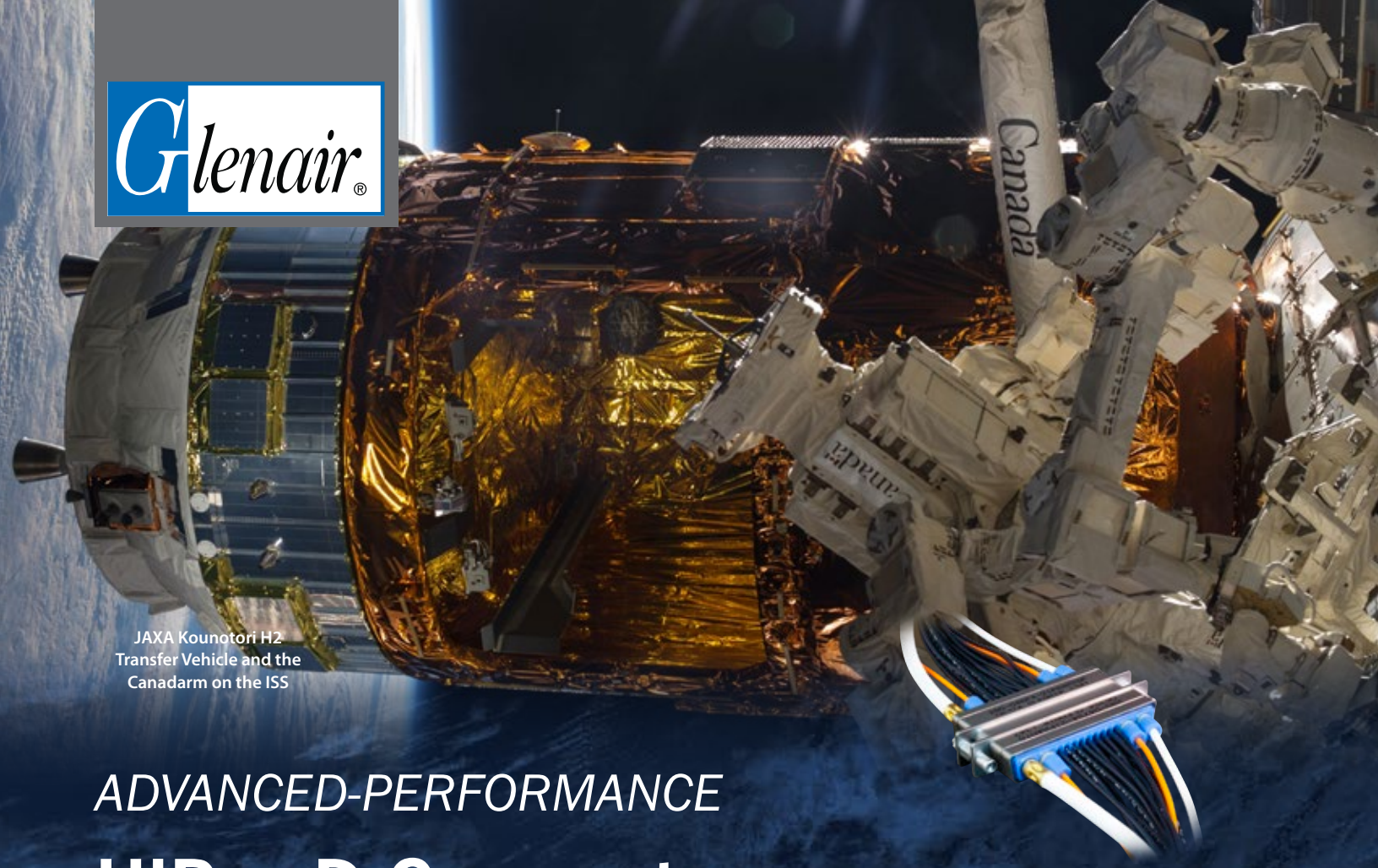
NANOMINIATURE CONTACT ARRANGEMENTS

Single Row Mating Face of Pin (Plug) Connector

Double Row Mating Face of Pin (Plug) Connector



Dimensions in Inches (millimeters) are subject to change without notice.



JAXA Kounotori H2 Transfer Vehicle and the Canadarm on the ISS

ADVANCED-PERFORMANCE

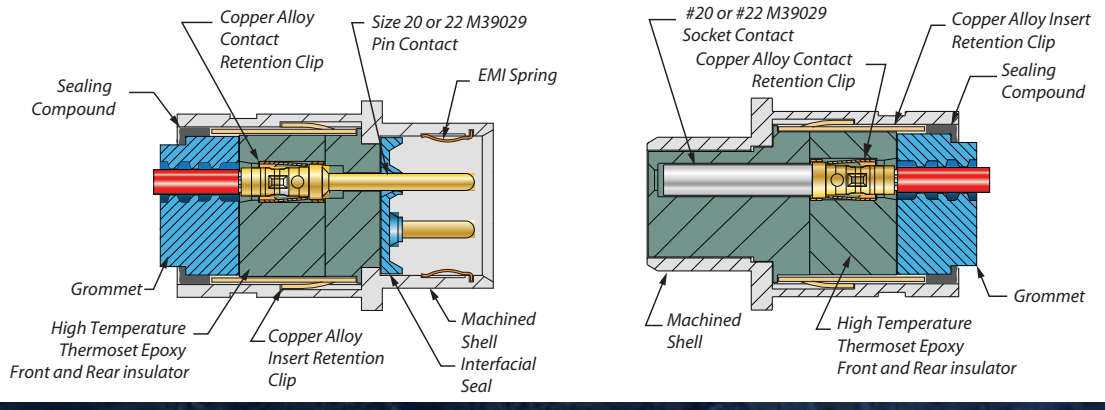
HiPer-D Connectors

Space-grade M24308 intermateable

The HiPer-D connector is a M24308-type D-Subminiature connector with superior design features. Unlike standard M24308 connectors with stamped steel shells, the HiPer-D connector features a one-piece machined shell, 200°C continuous operating temperature rating and enhanced, mated shell EMI/RFI protection via an integrated ground spring. Aerospace grade fluorosilicone grommets and face seals (JAXA / NASA outgassing available) provide environmental protection. The HiPer-D is intermateable, intermountable and interchangeable with standard M24308 D-Sub connectors.

- **Advanced temperature, vibration and EMC/ electrical performance**
- **11 standard and 20 combo insert arrangements**
- **High temperature epoxy insulators**
- **Watertight sealing**
- **Rugged machined one-piece shell**

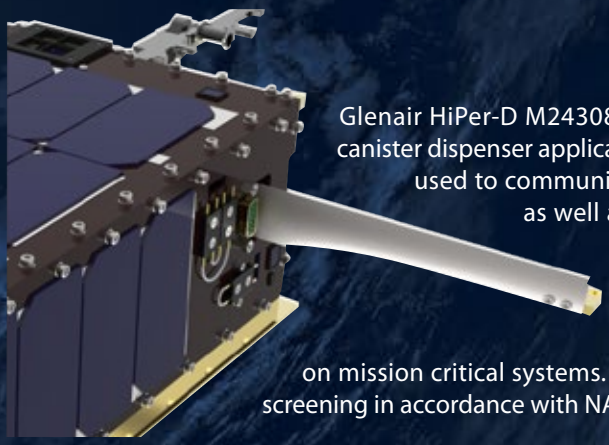
STANDARD AND HIGH DENSITY HiPer-D® - CUTAWAY



SERIES 28

HiPer-D Space Grade Connectors

Product features and specifications



Glenair HiPer-D M24308 D-sub connectors are ideally suited for CubeSat or NanoSat canister dispenser applications where rack and panel or connectorized wire assemblies are used to communicate with HDRMs, pin pullers, pin pushers, door status sensors, as well as system communications and testing prior to deployment of satellite equipment. Standardized usage of M24308 connectors on hardware interfaces simplifies interconnection and communication. Glenair HiPer-D space grade M24308 D-sub connectors eliminate potential interconnect electrical problems on mission critical systems. Connectors are supplied with NASA/ESA/JAXA outgassing and screening in accordance with NASA EEE-INST-0002.

HiPer-D High-Performance D-Sub vs. MIL-STD-24308		
Specification / Feature	**M24308**	**HiPer-D**
Temperature	-55°C to +125°C	-65°C to +200°C
Insulator	Thermoplastic	Thermoset Epoxy
Shell	Steel (Brass)	Aluminum (SST)
Voltage	1000 VAC	1000 VAC
Grounding	Dimples in shell (not in Mil-Spec)	Nickel-plated Copper Alloy EMI spring
Environmental	No	Yes
Vibration, sine	20 g	60 g
Vibration, random	N/A	43 g
Shock	50 g	300 g
Bolt-on backshells	No	Yes

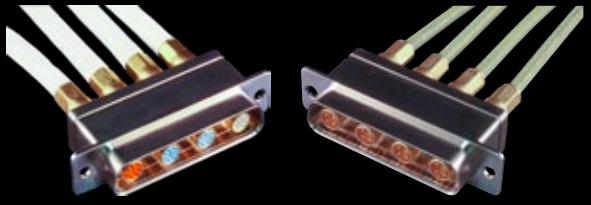
HiPer-D M24308 Combo-Ds for power, signal, and RF applications

- **Size #8 power and 50 ohm or 75 ohm RF contacts**
- **Mixed layouts with #8's and #20's**
- **200°C continuous operating temperature**
- **20 tooled layouts**
- **Crimp and PC tail terminations**

High-Speed HiPer-D High-Performance M24308

Crimp contact non-environmental connectors with #8 contacts for high-speed data transmission

- **One-piece rugged machined aluminum shell**
- **Two to five size 8 Coax, Twinax, Quadrax or Ochito contacts**
- **Common ground plane (no insulators)**
- **Available in straight and right angle PCB versions**



Dimensions in Inches (millimeters) are subject to change without notice.

Glenair®

Mars Curiosity rover self portrait. The MAHLI camera on Curiosity's robotic arm took multiple images that were stitched together into this selfie.

SERIES 80 MIGHTY MOUSE

Reducing the Size and Weight of Electrical Wire Interconnect Systems

SPACE GRADE
NASA
ESA, JAXA
SCREENED

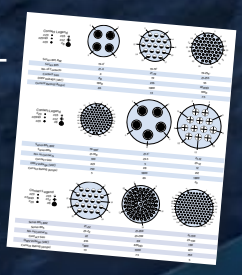
The industry standard ultraminiature interconnect—from low earth orbit to Mars

Mighty Mouse vs. 38999: less than half the size and weight.

- 8 coupling styles and 67 contact arrangements from 1 – 130 contacts
- MIL-DTL-38999 caliber performance
- Size #23, #22, #20, #20HD, #16, #12, #8 signal, power, fiber optic and shielded contacts
- Discrete connectors and turnkey cable assemblies
- Space-grade bakeout processing available

FULL RANGE OF SUPPORTED CONTACTS, 67 CONTACT ARRANGEMENTS

Signal | Power | Shielded | Fiber Optic | Pneumatic



67 arrangements, from 1–130 contacts

SERIES 80 ULTRAMINIATURE

Mighty Mouse Connectors and Cables

Connector series overview

CHOOSE FROM 8 DIFFERENT COUPLING DESIGNS

Series 800
UN thread

Series 801
double-start ACME thread

Series 802
AquaMouse UNEF thread

Series 803
bayonet coupling

Series 804
quick-disconnect

Series 824
locking quick-disconnect

Series 805
triple-start thread, size #23
contact layouts

Series 806
modified triple-start, size #22HD
and #20HD layouts

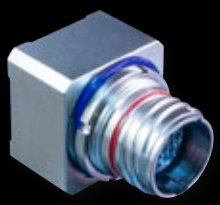
AVAILABLE MIGHTY MOUSE CONNECTOR CLASSES

IP67
environmental

Glass-to-metal seal
hermetic

CODE RED
encapsulant-seal hermetic

EMI/RFI
Filter



EMP Transient Voltage
Suppression

Bulkhead feed-thrus and
penetrators

Sav-Con®
connector savers

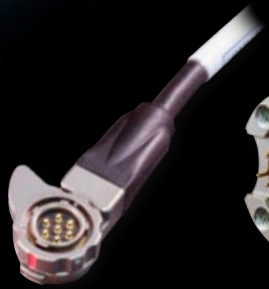
High-pressure subsea /
submersible

High-speed
Ethernet

Single- and multimode
fiber optic

AVAILABLE COTS SPECIAL-PURPOSE DESIGNS AND PACKAGING

Low-profile COBRA



Mouse Bud

Double-standoff PC tail

COTS flex jumpers

Special feed-thrus

Dimensions in Inches (millimeters) are subject to change without notice.

International Space Station Expedition 25 commander Doug Wheelock installed the Sabatier system to extract more water out of the ISS atmosphere

SPACE GRADE
NASA
ESA, JAXA
SCREENED

Series 806 Mil-Aero Connectors

Innovative design meets key performance benchmarks for harsh vibration, shock, and environmental settings—as well as high-altitude unpressurized zones with aggressive voltage ratings and altitude immersion standards

- Next-generation small form factor aerospace-grade circular connector
- Designed for general use in harsh application environments such as aircraft, industrial robotics and more
- Upgraded environmental, electrical and mechanical performance
- Integrated anti-decoupling technology
- Higher density 20HD and 22HD contact arrangements
- Glass hermetic, lightweight aluminum hermetic, and filtered versions
- +200° C temperature rating

SAVE SIZE AND WEIGHT WITH SERIES 806 CONNECTORS

Series 806 Mil-Aero
Smallest Size
.500 In. Mating Threads
3 #20 Contacts or 7 #22 contacts

MIL-DTL-38999
Smallest Size
.625 In. Mating Threads
3 #20 Contacts or 6 #22 contacts

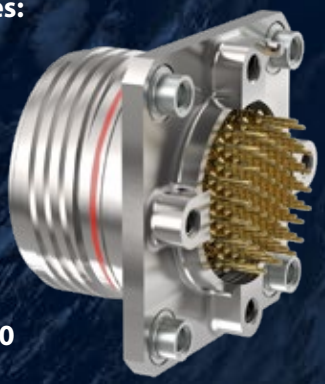
Series 806 Mil-Aero Ultraminiature Circular Connectors

for harsh space applications IAW MIL-DTL-38999

SERIES 806 MIL-AERO

SERIES 806 MIL-AERO: FEATURES / SPECIFICATIONS

- **Supported wire sizes:**
  #20HD contacts
  20–24 AWG
  #22HD contacts
  22–28AWG
- **Dielectric withstanding voltage**
  #20HD layouts:
  1800 Vac
  #22HD layouts: 1300 Vac
- **Reduced pitch triple-start modified anti-decoupling stub ACME mating threads**
- **"Triple ripple" wire sealing grommet (75,000 ft. rated)**
- **Integral Nano-Band shield termination platform**
- **EMI shielding effectiveness per D38999M para. 4.5.28 (65 dB min. leakage attenuation @ 10GHz)**
- **10,000 amp indirect lightning strike**
- **MIL-S-901 Grade A high impact shock**

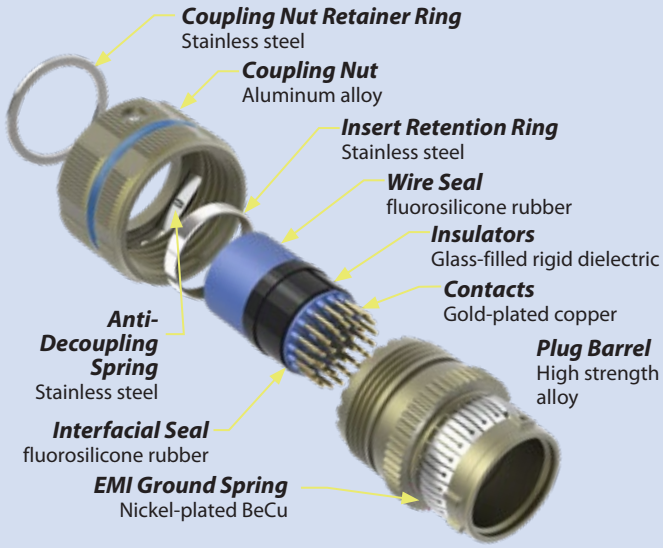


AVAILABLE LIGHTWEIGHT ALUMINUM "CODE RED" HERMETICS

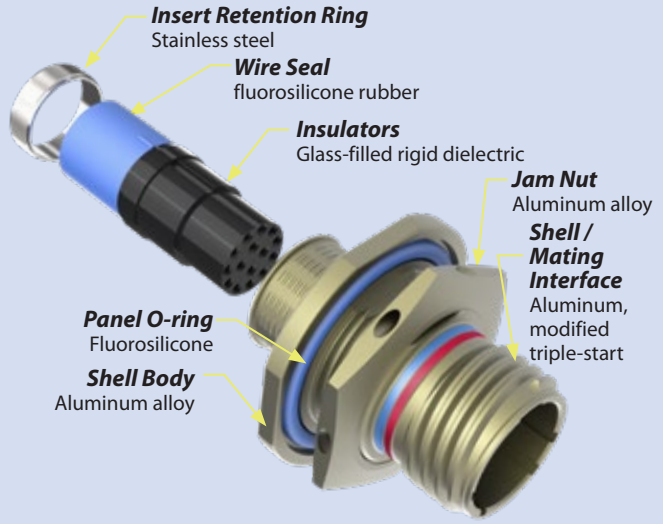
CODE RED is a lightweight encapsulant sealing and assembly process with 50% package-weight savings compared to glass-to-metal seal Kovar/stainless steel solutions. Non-outgassing CODE RED (IAW NASA/ESA) provides durable hermetic sealing with $1X10^{-7}$ leak rate performance. Gold-plated copper contacts deliver outstanding low-resistance current carrying capacity.

CODE RED

SERIES 806 MIL-AERO PLUG

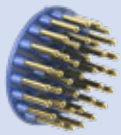


SERIES 806 MIL-AERO RECEPTACLE



SMALLER AND LIGHTER WITH EQUAL D38999 PERFORMANCE?

High-Density Layouts
Twice as many contacts in a smaller package



"Top Hat" Insulator
High voltage rating, foolproof alignment

Triple Ripple Wire Seal
Reliable 75,000 ft. altitude immersion

Dimensions in Inches (millimeters) are subject to change without notice.

Glenair®

View from the Cupola of the International Space Station

HIGH PERFORMANCE

Series 791

The next-generation ultraminiature rectangular connector for demanding aerospace applications

Polarized / keyed shells prevent mis-mating and allow designers to specify identical layouts side-by-side without risk of circuit damage

Sometimes the simplest ideas are the best ideas. The Series 791 is a simple idea. Let's create a brand new class of connector – the ultraminiature rectangular. Let's combine the versatility of the Series 790 Micro-D type connector with the rugged features of our popular HiPer-D M24308 type connector. Let's add a unique dual lobe shell and let's recess the pins to eliminate the possibility of scooping damage. Let's add high speed datalink capability.

Originally designed for NASA's Orion project, the 791 is qualified for manned space flight. The 791's small size and blind mate capability make it a perfect choice for 2U and 3U electronics modules. Applications include radars, weapons systems, comms gear, satellites, exoatmospheric vehicles, avionics, power distribution units, instrumentation, and everywhere else in need of a smaller, higher performance interconnect system.

- **Next-generation small form factor aerospace-grade rectangular connector**
- **Scoop-proof recessed pin contacts**
- **37 arrangements, 12 shell sizes for the ultimate in versatility**
- **Rugged aluminum alloy dual lobe shell**
- **Environmental**
- **EMI shielded**
- **Blind mating**

SERIES 791 MICRO-CRIMP

Next-generation ultraminiature rectangular

for demanding aerospace applications

SPACE GRADE
NASA
ESA, JAXA
SCREENED

SERIES
791
SEVEN
NINETY-ONE

About The Series 791

The Series 791 is an aerospace-grade ultraminiature rectangular connector with EMI protection and environmental sealing. Originally developed for NASA's Orion capsule, The 791 is qualified for manned space flight and is ideal for radars, weapons systems and avionics gear.

The Series 791 is available either with crimp pins or with printed circuit terminals. Machined aluminum alloy shells feature dual lobes for polarization. Contact sizes range from size 8 to size 23 in 37 arrangements. Pin contacts are recessed to prevent scooping damage while mating. Crimp contacts conform to M39029 requirements and are rear release.

An optional ground spring reduces susceptibility to EMI problems. Fluorosilicone face seals and wire grommets prevent moisture and contamination. Panel mount versions are available with an O-ring, or for improved panel bonding, a metal spring.

Board mount versions include straight or right angle terminals. Right angle PCB connectors feature an aluminum shroud covering the terminals.

Hardware options include screwlocks, jackscrews or guide pins for blind mate applications.

Save Size and Weight with Series 791 Connectors

The Next Generation Ultraminiature Rectangular Connector for Demanding Aerospace and Defense Applications

M-17P17 with size 16 contacts

- **Two to 102 contacts**
- **Coax, twinax, quadrax and Ochito octaxial contacts**
- **Rugged aluminum shell with dual polarizing lobes**

Shell size A – the smallest 791

- **Integral band platform for direct attachment of cable braid**
- **-65°C to +150°C**
- **Panel mount versions with O-ring or EMI spring**

- **37 contact arrangements**
- **Crimp-and-poke or epoxy-sealed board mount versions**
- **Scoop-proof recessed pins**
- **Size 23, 16, 12 and 8 contacts**

- **Straight and right angle printed circuit board mounting**
- **12 shell sizes**
- **Guide pins for blind mate modules**

- **Contacts meet SAE AS39029 requirements**
- **Internal ground spring for EMI protection**
- **Approved for manned space flight**

Dimensions in Inches (millimeters) are subject to change without notice.

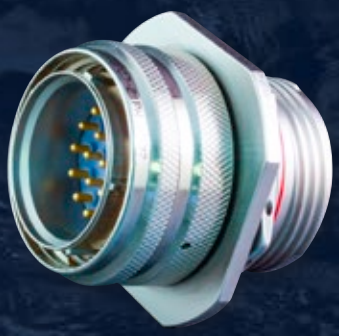
Glenair Sav-Con's protected the umbilical connectors on every Space Shuttle mission

SAV-CON®

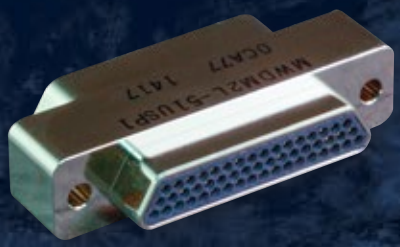
Connector Savers and Bulkhead Feed-Thrus

The smart solution for preventing contact damage and extending the service life of cable assemblies and box and panel-mount receptacles

- Sav-Con®s for every Military Standard connector—circular and rectangular
- Hundreds of successful space launch and space flight applications
- Glenair Sav-Con®s on board every Space Shuttle mission flown
- Bulkhead feed-thrus for environmental, filter and hermetic applications
- Pin/pin, pin/socket, and socket/socket versions
- Traditional plug-receptacle savers, as well as in-line versions and gender changers
- Available EMI/EMP filter savers and adapters
- Optional locking mechanism



Series changers and gender changers available in both Sav-Con® and bulkhead feed-thru configurations



circular and rectangular configurations available including hermetic and EMI/RFI filter configurations

HIGH-PERFORMANCE CONNECTOR GO-BETWEENS

Sav-Con® Connector Savers and Bulkhead Feed-Thrus

SPACE GRADE
NASA
ESA, JAXA
SCREENED

Each Glenair Sav-Con® Connector Saver meets the military specification performance requirements of its mating connector. Glenair manufactures and supplies a Sav-Con® connector saver for every military standard connector currently in use including:

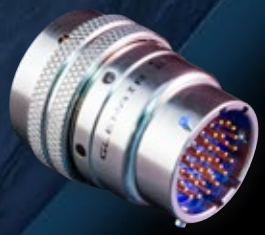
- MIL-DTL-26482 Series I and II
- MIL-DTL-28840
- MIL-DTL-38999 Series I, II and III
- MIL-DTL-83723
- LN 29729 (SJT)
- PATT 105 and PATT 602
- MIL-DTL-5015
- Series 801 and 805 Mighty Mouse
- Series 89 Nanominiature
- M24308 D-Subminiature
- MIL-DTL-83513 Micro-D Subminiature
- Series 28 HiPer-D M24308 intermateable
- Series 79 Micro-Crimp

Comprehensive materials, plating, and polarization options available

TRADITIONAL PLUG-RECEPTACLE SAV-CON® CONNECTOR SAVERS

MIL-DTL-38999 series III type

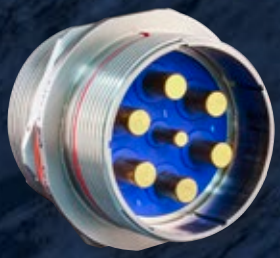
Series 89 Nanominiature rectangular



MIL-DTL-38999 series II bayonet-coupling saver

Series 80 Mighty Mouse Sav-Con®

BULKHEAD FEED-THRUS



Special high-voltage power bulkhead feed-thru

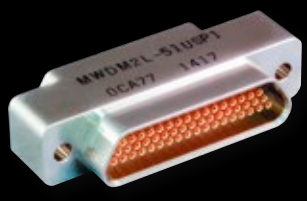
Special wide panel accommodation Mighty Mouse bulkhead feed-thru

MIL-DTL-5015 bulkhead feed-thru

Special non-cadmium plating classes

SPECIAL-PURPOSE ADAPTERS AND SAVERS

EMI/RFI filter Sav-Con® adapter (D38999 Series III type shown)



Rectangular EMI/RFI filter Sav-Con adapter (MIL-DTL-83513 type shown)

Power distribution connector savers (MIL-D-5015 type shown)

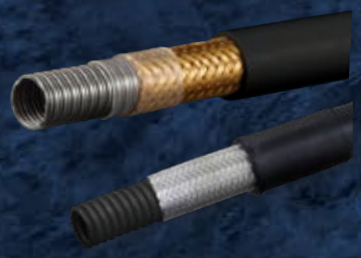
Dimensions in Inches (millimeters) are subject to change without notice. Rev. 04.24.19

Liftoff: a Delta II Launch Vehicle

POLYMER AND METAL-CORE

Conduit Systems

The flexible, lightweight alternative to standard jacketed cables



Conduit wire protection systems for space applications must be able to withstand extreme environments—from immersion in harsh chemicals, to temperature extremes and numerous flex cycles—without breakdown or failure. Glenair conduit systems are rigorously engineered to meet the exacting specifications of NASA, ESA and JAXA space programs, and have been successfully implemented in numerous space programs—from launch vehicles to the International Space Station and the Gravity Probe mission.

Lightweight, flexible polymer-core materials are available in a wide variety of materials to suit any application: Annular material choices include: Kynar, PVDF and G-FLEX Siltem, helical choices include ETFE, FEP, PFA, PTFE, and PEEK plus AS81914 /1 – 11 qualified materials and configurations.

Metal-core versions are specified for extreme crush resistance and optimal EMI shielding. The helically-wound metal conduit provides extremely high levels of EMI protection across all radiation fields and frequencies. Stainless steel versions are often specified for environments subject to the temperature extremes of space.

- **Hermetically sealed, flexible metal-core conduit for interconnect applications**
- **Lightweight, flexible helical and annular polymer-core materials and easy to install fittings, transitions and adapters**
- **Turnkey, factory-terminated assemblies for landing gear and other rugged aerospace applications**

METAL AND POLYMER CORE

Conduit Systems

Turnkey factory-terminated assemblies or user-installable systems

CONDUIT SYSTEMS

SERIES 72 CONVOLUTED TUBING PRODUCT SELECTION GUIDE

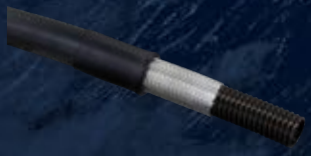
Convoluted Tubing

Factory Terminated Assemblies

Sentry system

Easy-to-Install Guardian system

SERIES 74 CONVOLUTED TUBING PRODUCT SELECTION GUIDE



Helical Convoluted Tubing

Factory Terminated Assemblies

Swivel-joint circular connector backshell

Easy Assembly Hat Trick System

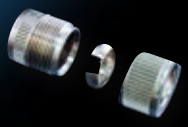
Super Durable Internal Braid System

Ultra Lightweight Composite Hummer Nut System

SERIES 75 METAL-CORE HELICALLY-WOUND CONDUIT PRODUCT SELECTION GUIDE

Metal-Core Helical-Wound Conduit

Turnkey Factory Terminated Assemblies



Low-Profile RP Plus System

Heavy-Duty Environmental Metal System

Heavy-Duty Hybrid Composite/ Aluminum

Reduce package size, weight, and labor with turnkey factory assemblies

- **Glenair can design, build, terminate—and even pre-wire—turnkey conduit wire routing solutions.**
- **Certified factory assemblers and calibrated tooling create better-performing systems.**
- **Simple point-to-point or complex multi-branch.**

Dimensions in Inches (millimeters) are subject to change without notice.

Glenair®

Delta II Lifts Off Carrying NPP,
a JPL CubeSat Experiment

AmberStrand® is ultra-lightweight microfilament metal clad EMI/RFI composite braiding.
Glenair offers AmberStrand® users direct factory overbraiding services for point-to-point and multi-branch interconnect assemblies.

LIGHTWEIGHT

AmberStrand®

Composite metal-clad EMI/RFI expandable braided shielding

The smart way to reduce launch and flight weights in aerospace systems

For many applications, the cable shield is the most important element in controlling EMI. Unfortunately, metal shielding—especially when applied in multiple layers—can be extremely heavy. The opportunity to provide robust EMI shielding at a fraction of the weight is the principal advantage of composite thermoplastic EMI/RFI braid made from AmberStrand® material. Transfer impedance test reports demonstrate the effectiveness of the material compared to conventional metal solutions. So get smart! Reduce weight and save money with AmberStrand®

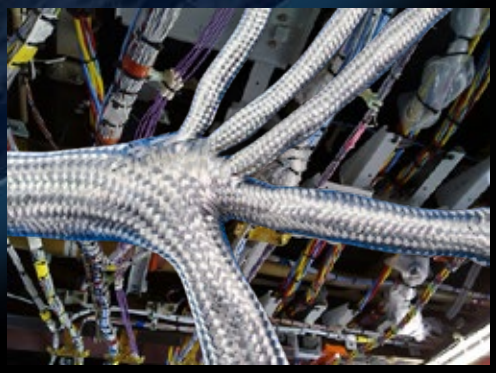
- **Metal-clad EMI/RFI Shielding with a lightweight composite thermoplastic base material**
- **Highly conductive surface plating**
- **Reduce shielding weight up to 80% and more**
- **Reduce operation costs by permanently reducing launch and aircraft all-up weights**
- **Superior high frequency shielding compared to tinned and/or nickel plated copper**
- **Tensile strength: 590,000 psi (min)**

LIGHTWEIGHT, FLEXIBLE

AmberStrand® Composite Braid for EMI/RFI Shielding Applications

The lightest weight EMI/RFI braid in the industry

103-026 AmberStrand® 100% Lightweight Composite Thermoplastic Nickel Plated EMI/RFI Braid		
Tensile Strength	590,000 psi (min)	ATP196 MOD
Operating Temperature	-80°C to +220°C	85% shielding effectiveness, 1000 hrs
Specific Gravity	1.45% (max)	ISO 1183
Thermal Cycling	No adverse effects in visual inspection or resistance after 50 cycles	-65°C to +200°C In accordance with ANSI/EIA-364-75-1997
Lightning Current	Glenair qualification test report 040607AMB	In accordance with ANSI/EIA-364-75-1997
Surface Transfer Impedance	Glenair qualification test report 040607AMB	IEC 96.1 A.5.5.3 method 2
Vertical Flammability	Self-extinguishing ≤ 2 sec. Burn length 0.1 in. max - Dripping 0.0 sec	14CFR part 25.853 (A) AMDT25-116 Appendix F Part I (a) (1) (ii)
Fungus Resistance Testing	28 day incubation test: No fungus growth	Mil-Std 810F, Method 508.5
Mass Loss And CVCM	1.0% max mass loss; .10% max CVCM	ASTM E595
Flex Test 50,000 Cycles	No tearing or visible damage	90° to 120° bend
Salt Spray 500 hrs.	DC Resistance IAW AS85049 .5 milliohms; no visible evidence of base metal on braid	ASTM B 117-03 Sodium Chloride 5%
Salt Fog SO_2	No damage or adverse effects	ASTM G 85 Annex 4 200 hrs.
JP-8 (Mil-T-83133) Military Jet Aircraft Fuel (70°C)	No fraying, DC resistance within limits (AS85049 paragraph 4.6.3)	Mil-STD 810F Method 504 (Modified)
Skydrol Military Jet Aircraft Fuel (90°C)	No fraying, DC resistance within limits (AS85049 paragraph 4.6.3)	Mil-STD 810F Method 504 (Modified)
Hydraulic Fluid Mil-H-5606 (70°C)	No fraying, DC resistance within limits (AS85049 paragraph 4.6.3)	Mil-STD 810F Method 504 (Modified)
Silicate Ester Based Coolanol 25R (70°C)	No fraying, DC resistance within limits (AS85049 paragraph 4.6.3)	Mil-STD 810F Method 504 (Modified)
Polyalphaolefin Mil-C-87252 (70°C)	No fraying, DC resistance within limits (AS85049 paragraph 4.6.3)	Mil-STD 810F Method 504 (Modified)
Lubricating Oil Mil-L-23699 8 hrs. @ 150°C, followed by 72 hrs. @ 65°C	No fraying, DC resistance within limits (AS85049 paragraph 4.6.3)	Mil-STD 810F Method 504 (Modified)
Isopropyl Alcohol 8 hrs. @ 50°C followed by 72 hrs. @ 65°C	No fraying, DC resistance within limits (AS85049 paragraph 4.6.3)	Mil-STD 810F Method 504 (Modified)
Cleaner Fluid Mil-C-85570 8 hrs. @ 23°C followed by 72 hrs. @ 65°C	No fraying, DC resistance within limits (AS85049 paragraph 4.6.3)	Mil-STD 810F Method 504 (Modified)
De-icer Fluid AMS-1432 8 hrs. @ 23°C followed by 72 hrs. @ 65°C	No fraying, DC resistance within limits (AS85049 paragraph 4.6.3)	Mil-STD 810F Method 504 (Modified)
Fire Extinguishing foam 8 hrs. @ 23°C followed by 72 hrs. @ 65°C	No fraying, DC resistance within limits (AS85049 paragraph 4.6.3)	Mil-STD 810F Method 504 (Modified)
R-134 Refrigerant 8 hrs. @ 23°C followed by 72 hrs. @ 65°C	No fraying, DC resistance within limits (AS85049 paragraph 4.6.3)	Mil-STD 810F Method 504 (Modified)

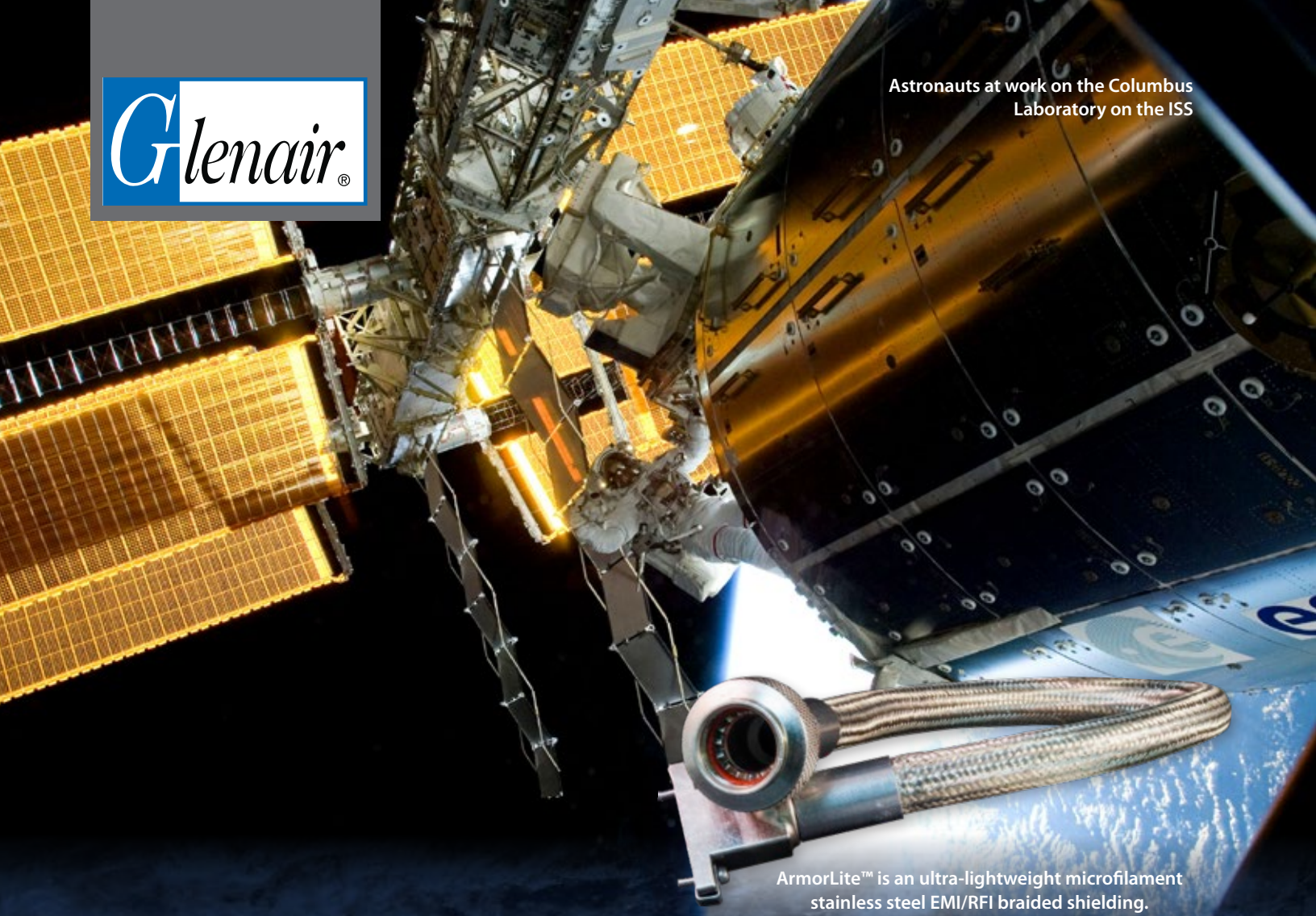


Up to 88% weight savings vs. NiCu

AmberStrand® 100% vs. nickel-coated copper			
Braid Dia.	AmberStrand® 100% 103-026	Nickel-Copper 100-003	% Weight Savings/ Foot
.062	.6	1.9	68%
.125	1.0	4.8	79%
.250	1.8	16.1	88%
.375	2.3	18.5	87%
.500	3.7	22.3	83%
.625	4.4	27.7	84%
.750	5.2	34.3	85%
1.000	8.0	35.0	77%

AmberStrand® 75% vs. nickel-coated copper			
Braid Dia.	AmberStrand® 75/25% NiCu 103-027	Nickel-Copper 100-003	% Weight Savings/ Foot
.062	.9	1.9	52%
.125	1.5	4.8	68%
.250	2.4	16.1	85%
.375	3.9	18.5	79%
.500	5.4	22.3	76%
.625	6.4	27.7	77%
.750	7.2	34.3	79%
1.000	11.0	35.0	69%

Glenair®



Astronauts at work on the Columbus Laboratory on the ISS

ArmorLite™ is an ultra-lightweight microfilament stainless steel EMI/RFI braided shielding. Available as tubular sleeving as well as direct factory overbraiding for point-to-point and multi-branch interconnect assemblies.

LIGHTWEIGHT

ARMORLITE™

Microfilament nickel-clad expandable stainless steel EMI/RFI braided shielding

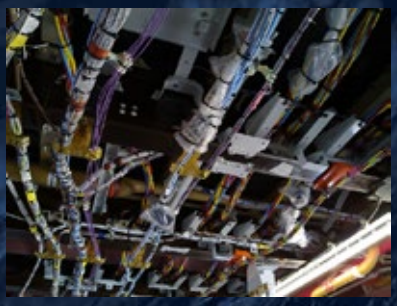
Save weight and money every time you fly! All-Up-Weight (AUW) has met its match: ArmorLite™ microfilament stainless steel braid saves pounds compared to standard QQ-B-575/A-A-59569 EMI/RFI shielding. ArmorLite™ is an expandable, flexible, high-strength, conductive stainless steel microfilament braid material designed for use as EMI/RFI shielding in high-performance wire interconnect systems. The principal benefit of ArmorLite™ is its extreme light weight compared to conventional nickel/copper shielding. By way of comparison, 100 feet of 5/8 inch ArmorLite™ is more than four pounds lighter than standard 575 A-A-59569 shielding. Plus, ArmorLite™ offers superior temperature tolerance compared to other lightweight tubular braided shielding including microfilament composite technologies.

- **Ultra-lightweight EMI/RFI braided sleeving for high-temperature applications -80°C to +260°C**
- **Microfilament stainless steel: *70% lighter* than NiCu A-A-59569/QQB575**
- **Outstanding EMI/RFI shielding and conductivity**
- **Aerospace environment qualified**
- **Superior flexibility and "windowing" resistance: 90 to 95% optical coverage**
- **70,000 psi (min.) tensile strength**
- **Best performing metallic braid during lightning tests (IAW ANSI/EIA-364-75-1997 Waveform 5B)**

LIGHTWEIGHT, FLEXIBLE

ArmorLite™ Microfilament Braid for EMI/RFI Shielding Applications

ARMORLITE™ AIRCRAFT UTILIZATION ANALYSIS COMPARED TO STANDARD A-A-59569 Ni/Cu BRAID



ArmorLite™ lightweight EMI/RFI braided shielding is ideally suited for weight reduction efforts in Electrical Wire Interconnect Systems

Length and Weight of NiCu Braid in Typical Commercial Aircraft			
Diameter (in)	Weight (Lb/ft)	Length (in)	weight (Lb)
0 - 0.25	0.02	12564.8	21.08
0.25 - 0.5	0.05	5259.3	21.17
0.5 - 0.75	0.07	1212.6	7.12
0.75 - 1.0	0.14	1437.4	16.88
1.0 - 1.5	0.18	467	7.05
		Total weight	**73.3**

Weight Savings Using ArmorLite™ (Equivalent Lengths)				
Diameter (in)	Weight (Lb/ft)	Length (in)	Length in feet	weight (Lb)
0 - 0.25	.00507	12564.8	1047.07	5.309
0.25 - 0.5	.0097	5259.3	438.28	4.251
0.5 - 0.75	.0178	1212.6	101.05	1.737
0.75 - 1.0	.0256	1437.4	119.78	3.063
1.0 - 1.5	.0368	467	38.92	1.434
		Total weight		**15.794**

Using ArmorLite™ in place of standard nickel-copper braid saves 54.6 pounds per system—up to 78% weight savings!

DESCRIPTION	REQUIREMENT	PROCEDURE	REPORT
Operating Temperature	-80°C to +260°C	(85% Shielding effectiveness 1000 hours)	ARM-103
Braid Resistivity test, Pre and Post	Test pre/post–5 cycles–minimal disparity per spec.	EIA-364-32D IAW AS85049	ARM-110/1
Surface Transfer Impedance	Glenair Qual. Test Plan ATP-194	Line injection IEC96-1 A.5.5.3 30KHz - 2.5 GHz mod	ARM-104
Shield Effectiveness Test, Pre and Post	Glenair Qual. Test Plan ATP-194	Line injection IEC96-1 A.5.5.3 30KHz - 2.5 GHz mod	ARM-104
Tensile/ Pull Strength	220 lbs. (min.). No anomalies within 8% - 10% of pre test for variable sizes	Glenair ATP- 183. 0 lbs. to 90 lbs, to 150 lbs, to 220lbs @ speed of 0.25 inches/min	ARM-105
Lightning Current Test	Glenair Qual. Test Plan 191/ DC resistance/ voltage criteria per DO-160F Level for 3 sizes up to 30Ka.	ANSI/EIA-364-75-1977 Wave Form 5B SAE/ARP5416 Section 6.3 Waveform 1, 3 (1, 10MHz) and 5A	ARM-110 ARM-112
Vertical Flammability	Self extinguishing ≤ 2 sec. Burn length 0.1 inch. max. Dripping 0.0 seconds.	14 CFR part 25.853 (a) AMdT25-116 Appendix F Part I (a) (1) (ii)	ARM-101
Mass Loss and Collected Volatile Condensable Materials	Total Mass Loss (TML) ≤1.0% Collected Volatile Condensable Matl.(CVCM) ≤.1%	ASTM E-595	ARM-102
Salt Spray Test	DC Resistance IAW AS85049 .5 milliohm. No evidence of base metal on braid	ASTM B117-09 Sodium Chloride 5% 500 Hrs	ARM-100
Vibration Resistance	EAI Test Report 33247. DO160 section 8 Cat. R Vib. Curves E1	DO-160F RTCA/DO-160F, Section 9, Fig. 8-4. Curve E1. - 3 sizes – 3 hours on each axis.	ARM-111
Thermal Shock Cycling test and Resistivity	No adverse effects in visual inspection or resistance after 50 cycles	EIA-364-32D, Table 3 Test condition V -75°C to +215°C	ARM-113
Abrasion and Plating test	DC Resistance IAW AS 85049. Glenair internal QTR-003	ATP 180 20 continuous @ 6 cycles/min. over 3 arms with .030 radiused edges	ARM-107
Fluid Immersion Test	Broad material compatibility	Customer/AS4373D method 601 Mod	ARM-106
Flex Test	2 Cycles: starting 0° over vertical ctr. line across to 180° cycle. Total cycles of 25633	Glenair ATP 179	ARM-112

Glenair®

NASA's STEREO
(Solar TErrestrial RElations Observatory),
artist's concept

SuperNine®

Blind-Mate Connectors

Rack and Panel Sealed, Assisted Kick-off and Feed-Through Blind-Mate to D38999

Blind-mate, fixed and float-mount interconnects for non-ITAR commercial as well as military/defense applications

Application: Glenair Series 253 blind-mate connectors are designed for use in commercial rack-and-panel instrumentation applications, satellite deployment, scientific payloads, interstage, UAV, and munitions release, and more.

- **Available in most symmetrical MIL-STD-1560 insert arrangements with contacts sizes from #23 to #8**
- **Selected materials offer low outgassing properties and high resistance to both corrosion and stress corrosion cracking**
- **NASA outgassing bake-out process available**
- **Designed to withstand the rigors of launch and flight—including shock, vibration, thermal vacuum, acceleration, and temperature extremes**
- **Standard accessory threads and teeth per MIL-DTL-38999 accommodate a wide range of backshell accessories**
- **Crimp-removable contacts standard. PC tails, dual-flange standoffs, hermetically sealed, and custom blind-mate configurations available**

SPACE-GRADE BLIND MATE

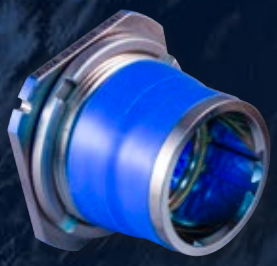
SuperNine®

Float-mount and adjustable separation force connectors

MIL-DTL-38999 Series III type, environmental, crimp contact

CRITICAL MECHANICAL FEATURES OF BLIND-MATE AND ADJUSTABLE SEPARATION FORCE (ZEF) CONNECTORS

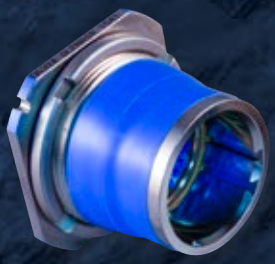
Roll-off nose: allows for the smooth disconnection of blind mate plugs and receptacles.



Float mounting: allows for coplanar movement of the receptacle during mating, preventing contact and shell damage.

Misalignment accommodation: Radial, axial, and angular misalignment during mating is accounted for with integral wave springs.

Sealing: Misalignment accommodation makes environmental sealing difficult. The problem is solved with auxiliary external seals.



EMI shielding: Glenair incorporates ground springs in receptacle connectors and grounding fingers in special coupling nut-equipped plugs to optimize 360° shell-to-shell continuity.

Assisted separation force: Adjustable kick-off style with spring-loaded posts and an adjustment ring to calibrate separation force. A second style uses **wave springs** on the shell body.

Available non-ITAR environmental blind-mate and adjustable separation force solutions		
Basic Part No.	**Description**	**Mates With**
253-014	Fixed jam-nut mount plug with roll-on/roll-off nose and Accessory threads	253-015
253-015	Floating jam-nut mount receptacle with misalignment accommodation and optional sealing	253-014
253-016	Fixed wall mount plug with spring assist (zero separation force)	253-017
253-017	Floating wall mount receptacle with adjustable separation force and misalignment accommodation	253-016
253-018-07	Blind-mate feed-thru, jam-nut mount plug with B-side D38999 type receptacle mating interface and assisted kick-off (spring force)	253-019
253-018-G6	Blind-mate in-line feed-thru with B-side D38999 type plug mating interface and assisted kick-off (spring force)	253-019
253-019	Floating jam-nut mount receptacle with misalignment accommodation and optional sealing	253-018
253-031	Blind-mate jam-nut mount plug with kick-off spring and accessory threads	253-032
253-032	Floating jam-nut mount receptacle with misalignment accommodation	253-031
253-033	Float mount feed-thru, jam nut mount receptacle to 38999 type Series III plug mating interface	253-019
253-025	Locking circuit and test mate connector	253-016

Launch of a Japanese H-IIA rocket with the Global Precipitation Measurement (GPM) Core Observatory onboard, from the Tanegashima Space Center

SPACE-RATED

Lanyard-Release Quick-Disconnect Connectors

For mission-critical disengagement and release of launch and payload systems

AS81703 space-grade lanyard release push pull mated pair with special order band and boot platform

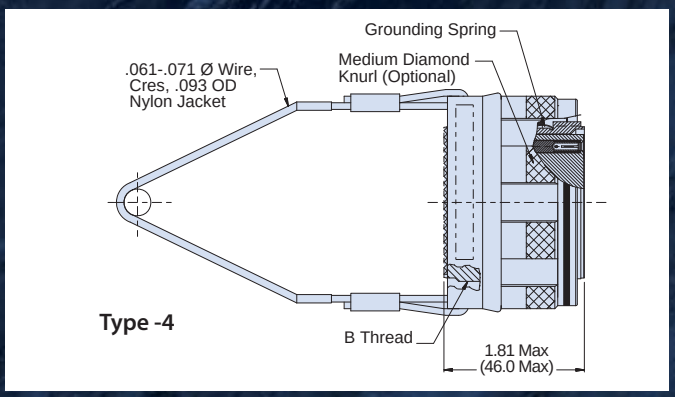
- **Jam-free, push on/pull off technology**
- **Reliable fail-safe axial pull lanyard equipped coupling**
- **Instant disengagement for critical quick-release systems**
- **Manufactured IAW MIL-STD-1760**
- **Special umbilical buffers and go-betweens also available**
- **Blind-mate rack-and-panel versions available**
- **Qualified for military and space application**
- **Outgas processing IAW NASA, ESA and JAXA**

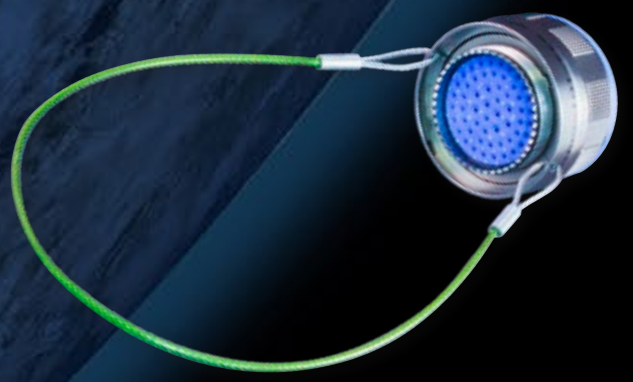
Mil-standard 1760 lanyard-release connectors were originally developed for carriage stores management applications including weapons, pods, and drop tanks. Incorporating a common electrical interface as well as interfacing signals and pin and circuit assignments, lanyard-release connectors of this type are broadly employed for reliable, jam-free mating and disengagement. Space-rated versions of 1760 class cylindrical connectors take advantage of the technology's legacy in harsh-duty aircraft applications to ensure reliable and predictable performance in space. From fail-safe application in space station and space telescope deployment to rack-and-panel research equipment interconnection, these rugged axial-pull lanyard connectors deliver proven performance in accordance with all applicable NASA, ESA, and JAXA standards. Available in a wide range of connector packaging, from MIL-DTL-38999 SuperNine® to AS81703* and special small form-factor designs, these proven-performance interconnection devices may be equipped with standard signal or power contacts as well as shielded high-speed coax, twinax, and quadrax.

SPACE-GRADE

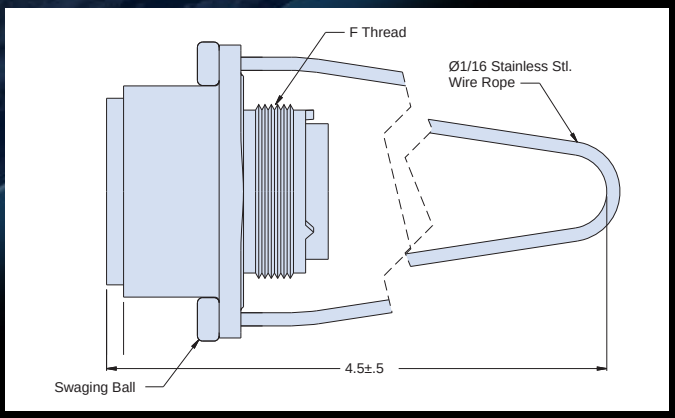
Lanyard-Release Quick-Disconnect Connectors

How To Order SuperNine® 233-216 MIL-DTL-38999 Type								
Sample Part Number	**233-216**	**-G6**	**ME**	**25-35**	**S**	**A**	**E**	**-4**
Series / Basic Part No.	**233-216** = Lanyard Release Plug							
Connector Style	**G6** = Plug with EMI Spring							
Finish	**ZL** = Cres, Electrodeposited Nickel **Z1** = Cres, Passivated **ME** = Al Alloy, Eletroless Nickel							
Size and Arrangement	Per MIL-STD-1560 plus high density							
Contact Type	**P** = Pin **S** = Socket; 500 cycles							
Alternate Key Position	**A**, **B**, **C**, **D**, **E**, **N** = Normal (Per MIL-DTL-38999 Series III)							
Lanyard Length Code	See Lanyard Length Table							
Connector Type	**4** = Type 4 (shown below, no accessory threads) **6** = Type 6 (not shown, includes accessory threads)							





How To Order 253-020 AS81703* Type Push-Pull Lanyard Release							
Sample Part Number	**253-020**	**-08**	**ME**	**25-35**	**S**	**N**	**812**
Series / Basic Part No.	**253-020** = AS81703 Type						
Connector Style	**08** = Push-Pull Layard-Release Plug						
Finish	**ZL** = Cres, Electrodeposited Nickel **Z1** = Cres, Passivated **ME** = Al Alloy, Eletroless Nickel						
Size and Arrangement	Per AS81703						
Contact Type	**P** = Pin **S** = Socket						
Alternate Key Position	**N**, **W**, **X**, **Y**, **B**, **C**						
Lanyard Ring Mod Code	**812** = Lanyard ring rotated 90° from master keyway **Omit** for standard ring						



*The MIL-C-81703 standard was superseded by SAE-AS81703 10-December 2010 per Navair

Glenair®

JAXA mission specialist Akihiko Hoshide inside the Kibo module

Best-of-Class Hermetic Connector Design Capabilities

Resolve gas, moisture and particle ingress problems with advanced-performance glass- and encapsulant-sealed hermetic connectors

- Superior pressure resistance to 32,000+ PSI
- Higher resistance to extreme operating temperatures to 260°+ C
- Superior mechanical strength
- No material breakdown or aging over time
- Helium leak rate <1X10^{-7} cc/sec to 1X10^{-10}

CODE RED

LIGHTWEIGHT HERMETIC SEALING

Lightweight hermetic encapsulant sealing solution with 1X10-7 leak rate performance. Available today in Mighty Mouse 806 Mil-Aero, M24308/9 D-Sub and D38999/23

Aluminum shell CODE RED hermetic connectors and copper contacts reduce weight and improve electrical performance compared to heavier-duty glass-to-metal seal hermetic solutions

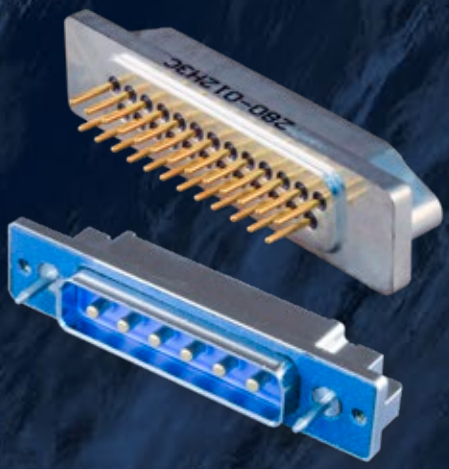
ADVANCED PERFORMANCE

Glass-Sealed Hermetic Connectors

GLASS-SEALED Hermetic CONNECTORS

UNIQUE HERMETIC OFFERINGS AVAILABLE AS CATALOG (COTS) SOLUTIONS

Coax, Triax, Quadrax and hybrid-contact layouts

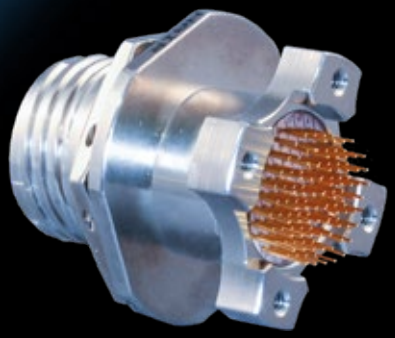


Rectangular hermetics including Series 28 HiPer-D and Series 79

MT ribbon fiber optic hermetic

Triax hermetic

Hermetic Sav-Con Feed-thrus and Gender Changers



Dual-flange PC tail hermetic

Hermetic with crimp-removable contacts

Hermetic bulkhead penetrators

Hermetic receptacles with integrated band porch

Dimensions in Inches (millimeters) are subject to change without notice.

Glenair®

The NASA/ESA Hubble Space Telescope

LIGHTWEIGHT, LOW RESISTANCE

CODE RED

"Mission-Critical" hermetic sealing with better than 1X10^{-7} leak-rate performance

Hermetically-sealed interconnects used in vacuum or high-altitude applications prevent moisture and other contaminants from damaging sensitive electronic equipment. Glass-to-metal hermetic sealing has been the gold standard in the aerospace and petrochemical industries for decades due to the strength and long-term durability of the materials used. But glass-to-metal seal hermetics come with a big price tag in both weight and electrical resistance.

CODE RED is an innovative sealing encapsulant and application process—invented by Glenair—that provides durable hermetic sealing in a lightweight aluminum package. CODE RED allows for the use of conventional gold-plated copper alloy contacts, significantly improving electrical performance. CODE RED hermetic connectors are available now in Glenair SuperNine® (D38999 Series III type metal and composite), Series 80 Mighty Mouse, and M24308 D-Sub; and deliver reliable, life-of-system 1X10^{-7} max leak-rate hermetic sealing. Special non-magnetic (zero residual magnetism) versions are also available, consult factory.

- **Full hermetic sealing, better than 1X10^{-7} in a lightweight aluminum shell with low electrical resistance gold-plated copper contacts**
- **Meets NASA outgassing requirements, as well as aerospace temperature and corrosion resistance standards**
- **Operating temperature -65°C to +200°C**
- **Available today in Mighty Mouse 806 Mil-Aero, M24308/9 D-Sub and D38999/23 glass-to-metal seal hermetics**
- **Significant weight savings—up to +50%**
- **Order-of-magnitude improvement in current carrying capacity and electrical resistance compared to Kovar/ Inconel solutions**

LIGHTWEIGHT, LOW RESISTANCE

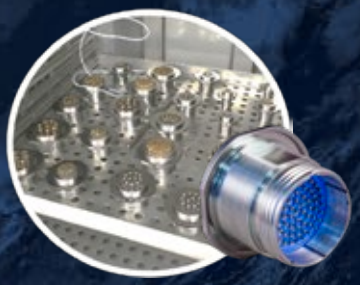
Code Red Hermetic Connectors

"Mission-Critical" hermetic sealing solution

CODE RED

SPACE GRADE
NASA
ESA, JAXA
SCREENED

CODE RED LIGHTWEIGHT HERMETIC CONNECTOR TESTING AND VALIDATION



Connectors utilizing CODE RED hermetic encapsulant sealing went through a grueling qualification test and validation process to prove material durability and hermeticity. Validation testing including 100 cycles of thermal shock IAW EIA-364-32 Test Condition A -65°C to +200°C while maintaining hermeticity followed by 1000 hours of thermal aging at 200°C. Additional tests included:

- DWV, DWV at altitude
- IR, IR at temperature
- Highly Accelerated Life Testing (HALT)
- Insert and contact retention
- Mating durability
- Random vibration at temperature IAW MIL-DTL-38999
- Hermetic seal at 30 psi

The entire qualification test cycle was repeated successfully a second time with new parts to validate complete reliability.

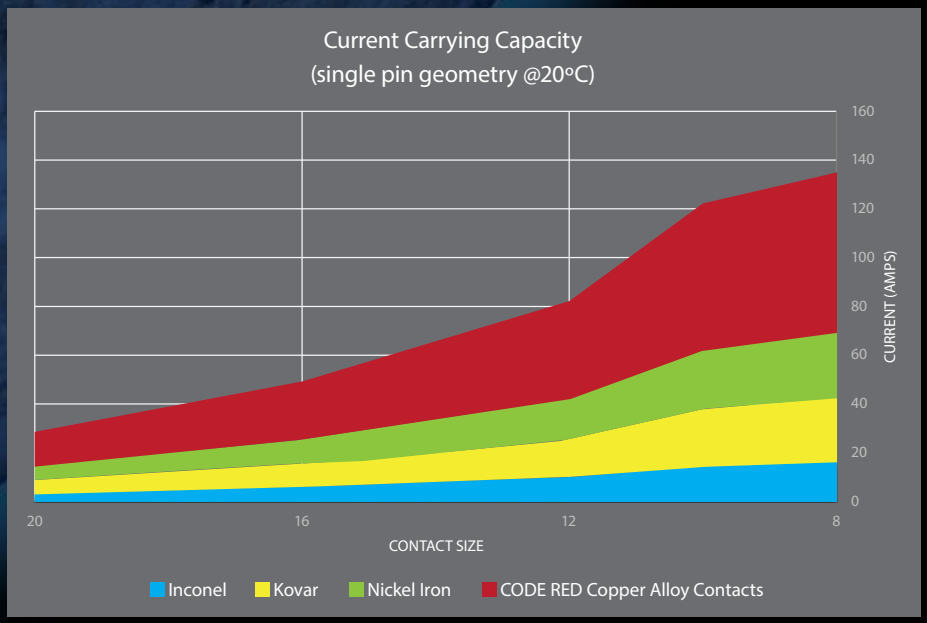
CODE RED USES PROVEN-PERFORMANCE CONNECTOR AND CONTACT MATERIALS

CODE RED Materials / Finish	
Sealing Adhesive	Proprietary Glenair compound
Contacts*	Gold-plated beryllium copper alloy per ASTM B 197 or equivalent
Insulator	Rigid plastic
Seals	Blended fluorosilicone/ silicone elastomer
Receptacle Shell and Jam Nut*	Aluminum alloy 6061-T6 per ASTM B 221
Finish*	Electroless nickel per ASTM B 733

*zero residual magnetism materials also available

Percentage Weight Savings CODE RED vs. Glass-to-Metal MIL-DTL-38999 Sr. III	
Shell Size/Insert Arr.	Weight Reduction
9-35	52%
11-98	47%
13-35	47%
15-97	42%
19-32	40%
21-11	32%
23-21	28%
25-08	43%

Graph illustrates Current Carrying Capacity of CODE RED copper alloy contacts compared to the Inconel, Kovar, and nickel iron contacts used in conventional glass-to-metal seal hermetics.



APPLICATION NOTES: CODE RED is a viable drop-in solution for conventional glass-to-metal seal hermetic connectors with the following exceptions:

1. Fuel Cells: Although CODE RED exhibits outstanding resistance to caustic chemicals and fuels, its use in fuel tanks/fuel cell applications is not recommended.

2. Cryogenics: CODE RED has been tested and qualified to -65°C IAW MIL-DTL-38999

3. Sustained High-Operating Temperatures: CODE RED has been tested and qualified to +200°C IAW MIL-DTL-38999

4. High Radiation: Exposure to no more than 6 Megarads of radiation

5. Deep Subsea: CODE RED is ideally suited for aerospace and downhole applications that do not exceed 3 BAR (50 psi) atmospheric pressure differential.

6. Space Life Support Systems: Requires additional qualification testing not yet performed by Glenair.

Dimensions in Inches (millimeters) are subject to change without notice.

Dr Chiaki Mukai is a cardiovascular surgeon and JAXA astronaut, the first Japanese woman in space

CIRCULAR AND RECTANGULAR

Backshells and Connector Accessories

Corrosion resistance, weight reduction, environmental durability and design innovation

Nowhere in the world does anyone manufacture and supply such a complete selection of backshell connector accessories—for space as well as all other mission-critical applications. In addition to traditional metal materials, Glenair also manufactures an extensive line of lightweight, corrosion-free composite thermoplastic interconnect components ideally suited for systems requiring electromagnetic compatibility, long-term durability and weight reduction.

The Glenair Qwik-Clamp connector accessory shown here is used on the International Space Station. This gold plated part is extremely resistant to space corrosion and radiation and is designed with all smooth surfaces to eliminate potential damage to space suits.

- **High-performance connector accessories for every environmental, mechanical and electromagnetic shielding requirements**
- **Qualified to AS85049, SSQ 21635, 21636, 22698 and 22681 and other standards and specs**
- **EMI shield termination, cable strain relief, connector protective covers and more**
- **Lightweight composite versions**
- **QPL AS85049 backshells**
- **Tens of thousands of popular part numbers in inventory ready for same-day shipment**

SPACE-GRADE INNOVATIONS

Circular and rectangular backshells and connector accessories

COMPOSITE DESIGN INNOVATION RADICALLY REDUCES INTERCONNECT SYSTEM WEIGHT

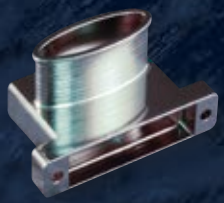
Band-in-a-Can composite backshell

Composite Swing-Arm with keyed drop-in banding insert

All-in-one booted "Piggyback" backshell

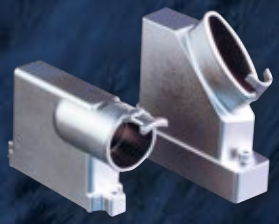
Isolated conductive ground path

M24308 D-SUB SOLUTIONS: HIGH PERFORMANCE, RUGGEDIZED D-SUBMINIATURE PRODUCTS



D-subminiature 90° elliptical-entry backshell

Split-shell M24308 composite backshell

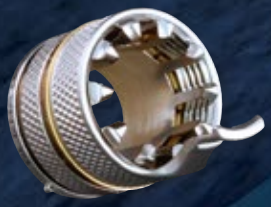


Composite D-subminiature backshells

Flex-D Composite M24308 Backshell

M24308 EMI/RFI dual-entry backshell

BACKSHELL INNOVATION SHOWCASE



TAG-Ring/Qwik-Ty® Feed-Through Fitting

Spring-Loaded "Flop-Lid" Protective Cover

Special Space Grade Rectangular Backshell

Ultra Low-Profile Backshell

Series 437-001 Backshell "Connector Saver"

Environmental Protective Covers

Mighty Mouse composite EMI/RFI banding backshell

High-Performance Banding Backshell

Dimensions in Inches (millimeters) are subject to change without notice.

Reference Applications

Brief history of Glenair space-grade design-ins

Atmospheric Infrared Sounder (AIRS)

Glenair-built cables provide signal and power interconnection on a broad range of space applications including The **Atmospheric Infrared Sounder (AIRS)** instrument aboard the Aqua Earth-observing satellite, JPL Mars Probes, the Space Shuttle, and the AIRS satellite. Several notable space applications include:

The **Gravity Probe**, confirmed two key predictions of Einstein's general theory of relativity in 2011 by monitoring the orientations of ultra-sensitive gyroscopes relative to a distant guide star. Glenair-built cables are on board.

Gravity Probe

Titan II space-launch vehicles, with Glenair-made interconnect harnesses, propelled all twelve manned Gemini capsules.

Hermetic connectors are ideal for high-pressure/low-leakage applications in air, sea and space environments. Made of stainless steel (CRES) with glass insulators fused to the connector shell, and suitable contacts meeting a leak rate of 1 X 10^{-6} cubic centimeters of Helium per second, these mounted receptacle connectors and bulkhead feed thrus prevent gases from travelling through apertures or penetrations created for the routing of interconnect cabling. Glenair hermetics have protected a range of space programs including:

The **X-38** program implemented to design and build a spacecraft capable of flying itself and the Space Station crew back to Earth in an orbital emergency.

The X-38

Pegasus rockets, the winged space booster vehicles used in an expendable launch system developed by private industry.

MetOp-A, Europe's polar-orbiting satellite dedicated to operational meteorology.

A well designed interconnect system will include a complement of grounding and shielding technologies to insure EMC. ***EMI filter connectors*** are an effective method to achieve electro-magnetic compatibility. Glenair is extremely well versed in supplying filter connector products optimized for use in space-grade applications, providing products compliant to EEE-INST-002, Table 2G, the recognized standard for space grade filters. Glenair MIL-DTL-38999, Series 80 Mighty Mouse, Series 28 HiPer-D, and Series 79 Micro-Crimp filter connectors are currently qualified and used by Ball Aerospace, Boeing Space, NASA/JPL, Orbital Sciences, Sierra Nevada Corp., and others. Notable Glenair Filtered connector space applications include:

MetOp-A

Skynet, for the United Kingdom Ministry of Defence, to provide strategic communication services to the three branches of the British Armed Forces and to NATO forces engaged on coalition tasks.

JWST

The **James Webb Space Telescope (JWST)** is a large, infrared-optimized space telescope. JWST is designed to find the first galaxies that formed in the early Universe, connecting the Big Bang to our own Milky Way Galaxy.

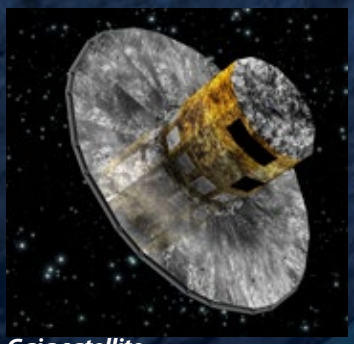
Micro-D connectors, including environmentals, hermetics, filters, and flex assemblies are commonly used in space applications for their high-performance and small size. The precision-machined shell of the Micro-D, with its robust mating retention forces, makes for an ideal connector for rocket and space vehicle applications that are subject to high levels of vibration and shock. The Micro-D is easily customized with package and mounting modification to fit virtually any integration challenge. A short list of Glenair Micro-D space applications would include the James Webb Space Telescope, SkyNet 5 military satellite, ALMA space telescope, JPL Mars Probe, Mars Curiosity Rover, AIRS satellite, and others. Several notable space applications that use Glenair Micro-D connectors include:

Skynet

The **Herschel Space Observatory**, from the European Space Agency, made several scientific discoveries in its operational phase from 2009 – 2013, including a previously unknown and unexpected step in the star formation process, and the presence of molecular oxygen in space.

Herschel Space Observatory

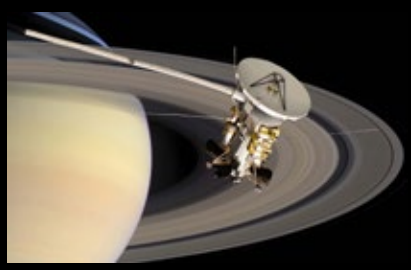
The European Space Agency also developed and built the **Gaia** satellite. Launched in 2013, its mission is to construct the largest and most precise map to date of the Milky Way. Its 2016 data release included positions and magnitudes for 1.1 billion stars



Gaia satellite

Cassini–Huygens was a joint NASA/ESA/ASI robotic spacecraft mission studying Saturn and its moons. Cassini executed several risky passes through Saturn's inner rings before completing its mission by burning up in atmospheric entry—but the data it returned will be analyzed for years to come.

CrIS is an advanced atmospheric sounding instrument aboard the United States Suomi National Polar Partnership (NPP) Polar-orbiting Operational Environmental Satellite. It produces high-resolution pressure, temperature, and moisture profiles from space, enabling more accurate predictions of severe weather events.



Cassini-Huygens

Glenair M32139 Class S Nanominiature connectors are DSCC approved for space programs. Glenair Nanominiature connectors, cable assemblies and flex circuit assemblies are currently in use on the several space-based telescopes,

CrIS NPOESS Satellite

including the **Large Synoptic Survey Telescope (LSST)**, **James Webb Space Telescope**, and others.

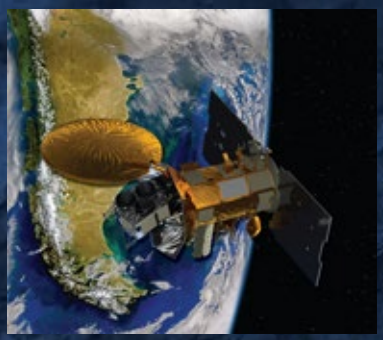
The ***Series 79*** connector is a Glenair original design. It features crimp, rear-release size #23 contacts on 0.075" spacing, as well as size #12 and #16 power and coaxial crimp contacts available in 29 insert arrangements for data and power transmission. The Series 79 Micro-Crimp is ideally suited for blind-mate rack and panel and/or module-to-chassis applications; and is currently qualified for use by Orion, Ball Aerospace, Honeywell Space, and LMCO Denver.

Glenair ***Series 80 Mighty Mouse*** connector and cable assemblies were developed as a smaller and lighter alternative to MIL-DTL-38999, offering virtually equal performance with up to 71% (weight) and 52% (size) savings for similar contact layouts. Mighty Mouse is well established in hundreds of safety-critical military, medical, industrial and geo-physical and space applications. Some space applications for this reduced form factor connector include:

NASA's **Mars Exploration Rover (MER)** Mission, an ongoing robotic mission to explore the Martian surface and geology. The Opportunity rover is continuing her winter exploration of "Perseverance Valley" on the west rim of Endeavour Crater.

Mars Curiosity Rover's latest selfie, January 2019

The Mars Science Laboratory **Curiosity** landed in Mars' Gale Crater in 2012. This rover is over five times as heavy and carries over ten times the weight in scientific instruments as previous rovers. Within weeks, Curiosity discovered an ancient steambed where water once flowed, and evidence of a lake that could have supported microbial life in the distant past. Curiosity's original 2-year mission has been extended indefinitely, and it's still returning valuable data more than 5 years after landing.

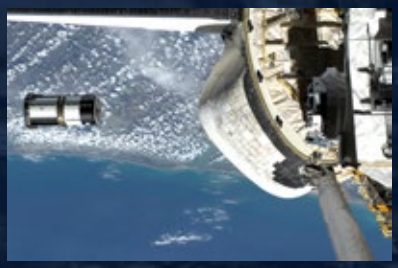


Aquarius Satellite

Aquarius was a satellite mission to measure global Sea Surface Salinity. It provided the global view of salinity variability needed for climate studies.

Glenair ***Sav-Con® Connector Savers*** protect deliverable connectors subject to repeated mating and unmating cycles, especially from repetitive qualification test cycles. Sav-Con® Connector Savers prevent costly repair or replacement of cable plugs and receptacle connectors by absorbing connect and disconnect abuse and by reducing mating cycles during testing to the absolute minimum.

A virtual "Who's Who" of space programs use Glenair Sav-Cons including Boeing Satellite Systems, the Delta IV launch vehicle, Voyager, Galileo, Magellan, Cassini, and others—both during fabrication testing and in operation.



A NASA LEO (Low Earth Orbit) Satellite

One of the most dramatic applications of our Sav-Con connectors is on the **Space Shuttle Orbiter** where they provided protection for the umbilical connectors from liftoff to touchdown on every mission.

For many space applications, the cable shield is the most important element in controlling EMI and radiation damage. Unfortunately, metal shielding—especially when applied in multiple layers—can be extremely heavy. ***AmberStrand*** composite thermoplastic braid, and ***ArmorLite*** microfilament stainless steel braid provide robust EMI shielding at a fraction of the weight of

conventional shielding. Glenair lightweight braid technologies are currently qualified for use by EADS Astrium, Honeywell Space, Orbital Sciences, and Ball Aerospace. These unique products notably served on:

The **Cassini-Huygens** Program, an international science mission to the Saturnian system.

Mars Pathfinder, which delivered an instrumented lander and a free-ranging robotic rover to the surface of the red planet.

Ariane 5

The Glenair ***Qwik-Clamp backshell*** is used on the **International Space Station**. This gold plated part is extremely resistant to space corrosion and radiation and is designed with all smooth surfaces to eliminate potential damage to space suits.

Other circular backshell and connector accessory space applications include:

The European Space Agency's **Ariane 5**, which launches satellites and other craft into geostationary transfer orbit (GTO), medium and low Earth orbits, Sun-synchronous orbits (SSO) and Earth-escape trajectories

SEA Launch was a spacecraft launch service using a mobile sea platform for equatorial launches of commercial payloads.

As with circular backshells and accessories, Glenair has the rectangular interconnect world well covered. We supply everything from miniaturized backshells for Micro-D connectors to larger rack-and-panel connector accessories. Glenair rectangular accessories are used on dozens of space programs including the International Space Station, MetOps, Herschel Space Observatory, James Webb telescope, and others.

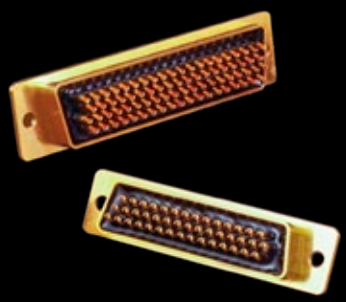
Space-grade Qwik-Clamp backshell designed for the International Space Station

Recent / Notable Space-Grade Application Wins for Glenair

Glenair is the exclusive interconnect connector and cable supplier to the Sierra Nevada Dream Chaser reusable crewed suborbital and orbital space plane. The Dream Chaser electrical wire interconnect system incorporates Glenair Micro-D subminiature connectors, EMI filter connectors, flex circuitry, lightweight microfilament braid, metal and composite backshells, and other technologies.

The Glenair Series 28 HiPer-D High-Performance MIL-24308 Intermateable

Glenair's qualified MIL-DTL-24308 Class K space-grade hermetic, and our recently-introduced Series 28 HiPer-D connector series have become the go-to standard for mission-critical space applications and are now qualified for use by Ball Aerospace, LMCO Denver, Orbital Sciences, and others.



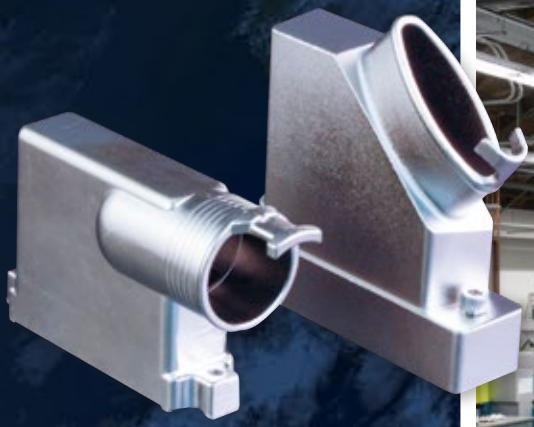
Gold-plated space-grade Series 28 HiPer-D connectors

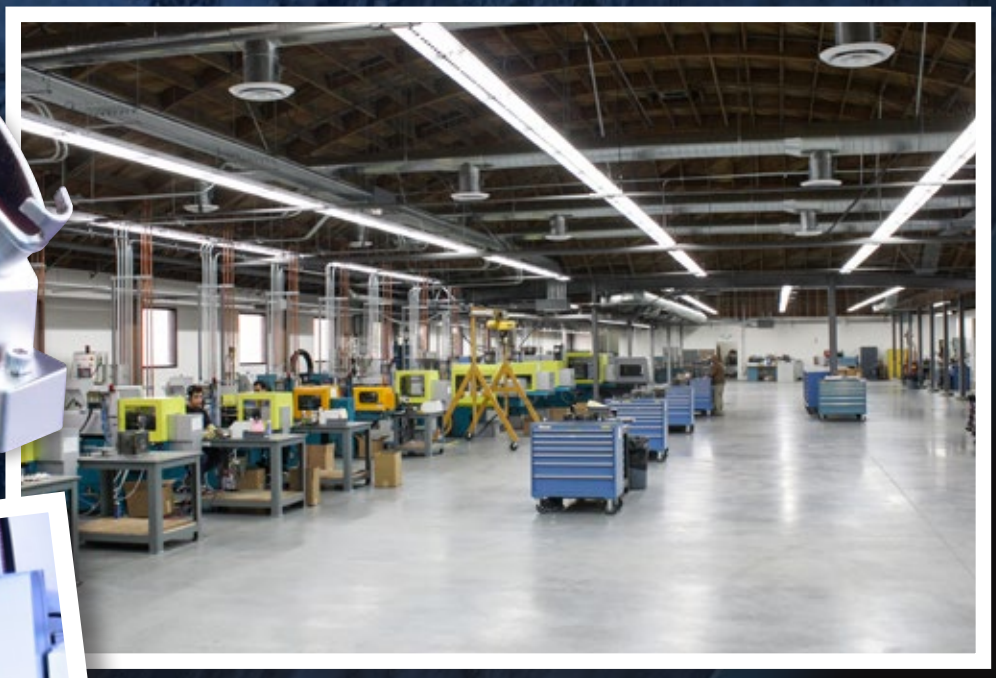
Glenair Factory Tour

GLENDALE, CALIFORNIA

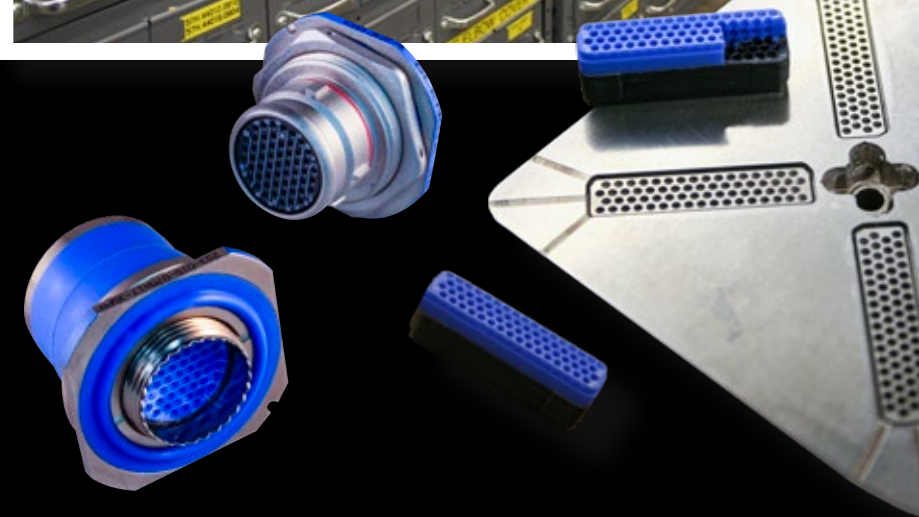
Complete vertical integration of manufacturing resources—at home in Southern California since 1956

Glenair operates the largest precision machining facility in the high-performance interconnect industry, allowing us to support both small and large-volume interconnect requirements—from one piece to 100,000





Glenair's massive investment in composite thermoplastic injection molding capabilities—the largest in the high-reliability interconnect industry—includes machinery, tooling, and most importantly, professional operators



Glenair Factory Tour

Glenair's Complex Cable Group (CCG) has delivered creative engineering, high-quality workmanship, fast response, and on-time delivery to countless cable harness and ruggedized interconnect assembly customers for over 60 years—including countless space-grade and space flight applications. The operation—from cable design through fabrication, test, and delivery—is fully integrated into Glenair's Glendale campus, ISO 9001 and AS9100 quality system, and high-availability business model.

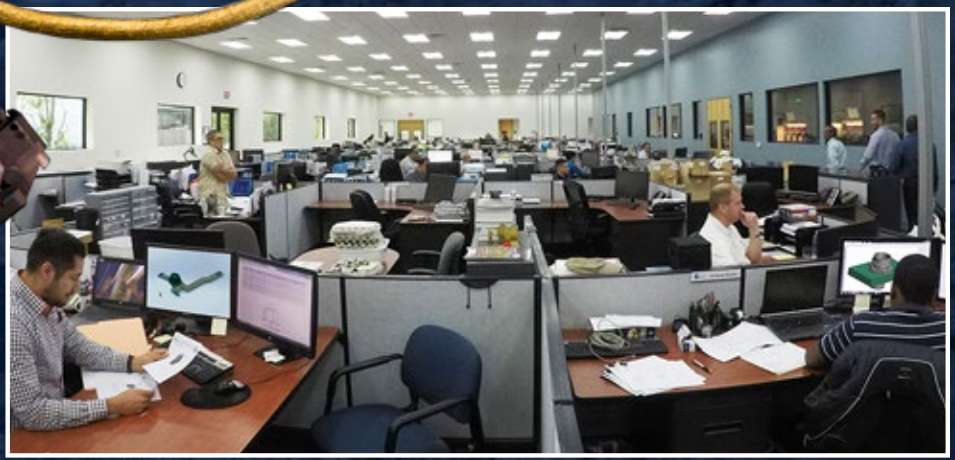
High-speed production overmolding

Multibranch assembly with lightweight ArmorLite™ microfilament EMI/RFI overbraid

Continuity testing standard on all cable circuits

Commander Ed White's "Golden Umbilical," with space-grade radiation shielding

Reliable Band-Master ATS® EMI/RFI shield termination technology used extensively throughout the shop



Glenair's engineering team in Glendale is augmented by regional teams worldwide, and we love to travel. Our place or yours? We work at our customers' convenience.

The Glenair Culture

COMMITTED TO QUALITY AND CUSTOMER SERVICE SINCE 1956

Glenair is proud of the quality and reliability we build into our broad range of mission-critical interconnect solutions—from discrete connectors to complex cable assemblies and embedded systems. Glenair is the biggest "made in the USA" interconnect supplier in the high-reliability industry, but we also operate factories in the UK, Italy, and Germany to serve the unique requirements of those markets. Glenair's Worldwide Quality System is ISO 9001 and AS9100 certified and registered. We also hold many discrete product and operations certifications for specialty, high-performance markets including space, nuclear power, and rail. In addition to world-class quality, we are laser-focused on customer service and committed to being the easiest manufacturer in our industry to do business with. Here are just some of our key customer service principles:

Lightning-fast turnarounds on quotes and special orders

Huge same-day shipment inventory

Worldwide sales and technical support in every major market

Full-spectrum, "no gap" product lines

LIBERAL NRE POLICY

Generous NRE, RMA, and sample request policies

Abundant engineering and technical support

No attitudinal constraints when it comes to customer convenience and service

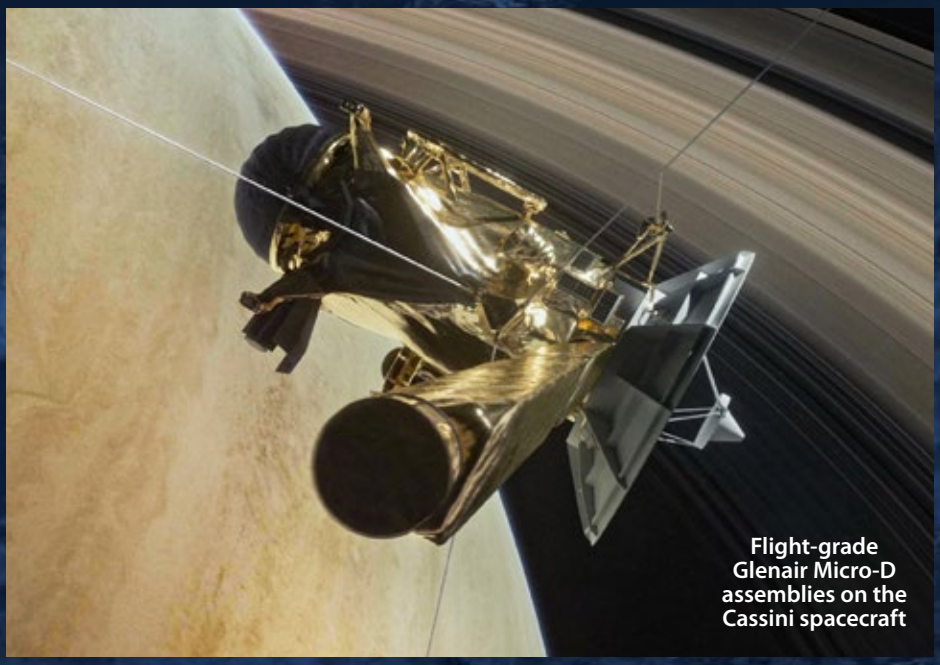
NO MINS. No Dollar or Quantity Minimum Orders

No dollar or quantity minimums

Glenair UK Factory Tour

MANSFIELD, ENGLAND

Mission-critical interconnect technologies for the UK and European markets with a special focus on micro and nanominiature flex assemblies



Flight-grade Glenair Micro-D assemblies on the Cassini spacecraft

ESCC series Micro connectors for ESA space and other UK and EU markets

Glenair UK is Glenair's Centre of Excellence for the design, build and qualification of its extensive Micro-D and Nano connector product portfolio for the European and global space market. Glenair UK have more than 30 years of experience in the manufacture of MIL-DTL-83513 Micro-D and MIL-DTL-32139 Nano compliant connectors.

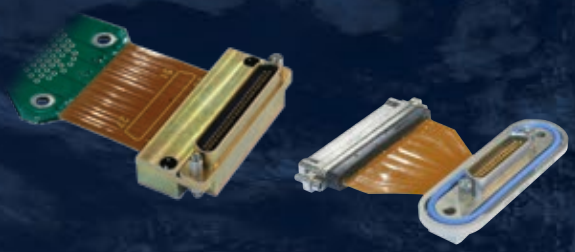
From standard flying-lead and PCB mount connectors to complex screened cable assemblies, Glenair production staff are trained and qualified to the exacting standards of IPC WHMA-A-620 and ESA soldering and crimping process standards: ECSS-Q-ST-70-08 & ECSS-Q-ST-70-26.

Certified to ISO/IEC 17025, Glenair's in-house independent test laboratory is capable of running all industry standard qualification programs for its space flight customers—from outgassing to full qualification programs (ESA and NASA).

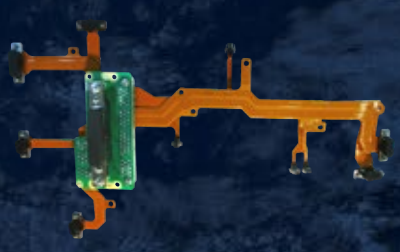
GLENAIR UK QUALITY STANDARDS AND APPROVALS

- ISO Class 8 Clean Room IAW FED STD 209E class 100,000
- Quality Management System certified according to AS9100 and ISO 9001
- Independent Test Laboratory Certified to ISO/IEC 17025 IECQ 01 and IECQ 03-6

MICRO AND NANOMINIATURE HARNESS AND FLEX ASSEMBLIES



Terminated and tested flexi and rigid flexi point-to-point assemblies with Glenair Micro and Nano interconnects



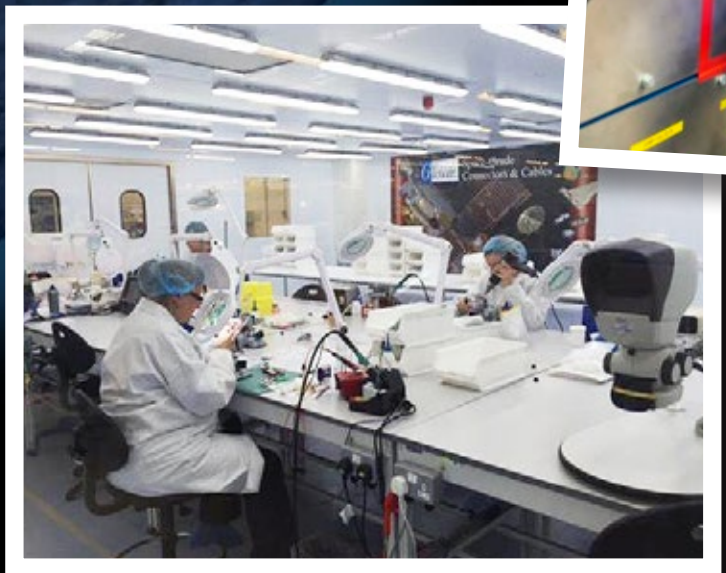
Complex multibranch flexi and rigid flexi assembly with Glenair Micro and Nano interconnects

Micro and Nano wired harnesses and pigtails

The Glenair Mansfield machine shop houses a full complement of CNC milling, turning, measurement, and mechanical inspection equipment

Micro-D and Nanominiature harnessing is completed in our AS9100 / ISO 9001 certified facility

The Glenair Mansfield clean room assembly area is used for fabrication of laser, space, and satellite assemblies IAW ISO Class 8 -100,000 PPM



Glenair UK operates an independently accredited BS9000:CECC:IECQ test lab for both internal as well as third-party product development / design verification and connector qualification

Glenair Factory Tour

BOLOGNA, ITALY

Glenair Italia serves harsh-environment military, nuclear, rail, and industrial markets with power, high-speed Ethernet, hazardous-zone interconnects and more.

SUPER ITS™ HIGH-PERFORMANCE REVERSE BAYONET

Higher temperature and ampacity rating with rigid insert and mechanical contact retention

HIGH VOLTAGE SOLUTIONS

15kV high-voltage connector series

HERMETIC CONNECTORS

UMBILICAL CONNECTORS

Umbilical interconnects, go-betweens, tilting buffers, and more

RUGGEDIZED ETHERNET CONNECTORS

Tested for compliance according to EN50173-1 standards for CAT5E and CAT7

Ethernet Cat7A contacts

Ethernet Cat5 contacts

Coax contacts

Ethernet MVB - WBT contacts

MULTIPOLE POWER CONNECTORS

Pulse Width Modulation 3kV connector for AIRBUS

Total vertical integration includes in-house contact fabrication and in-house injection molding

High-capacity CNC machining centers allow Glenair BLQ to provide lightning-fast turnaround on small and custom orders as well as large production runs, all with superior surface finishes and better part quality.

In-house test lab with capabilities for both high voltage as well as high speed signal product qualification

Glenair Italia hosts the most modern and comprehensive interconnect plating facility in Europe

Glenair Factory Tour

SALEM, GERMANY

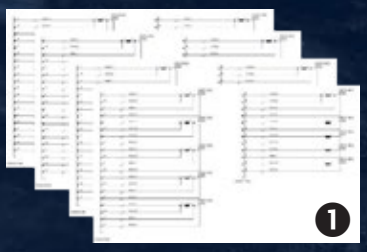
Space-grade interconnect harnesses and ESGE test rack systems for satellite applications—ESA certified

Glenair®
SPACE SYSTEMS

Glenair Space Systems: a mission-critical space-grade harness, test, production, and integration operation. ESA-certified assembly staff plus value-added Engineering Base and 3D SolidWorks design, prototyping, and clean-room facilities.

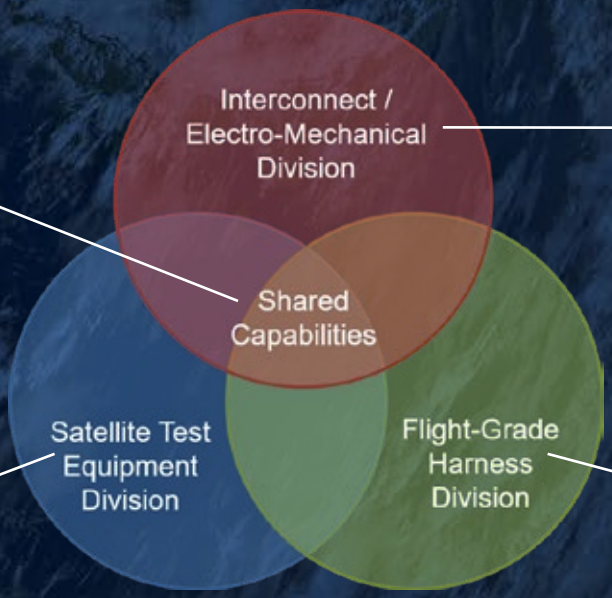
THE POWER OF GSS VALUE-ADDED ENGINEERING AND MANUFACTURING

A turnkey design and fabrication operation: from documentation (1), to prototype (2), to production (3), to integration (4).



GLENAIR SPACE SYSTEMS CORE CAPABILITIES AND TECHNICAL TEAMS

Customer-focused value-added engineering, integration and project management services leveraging CAD and Engineering Base



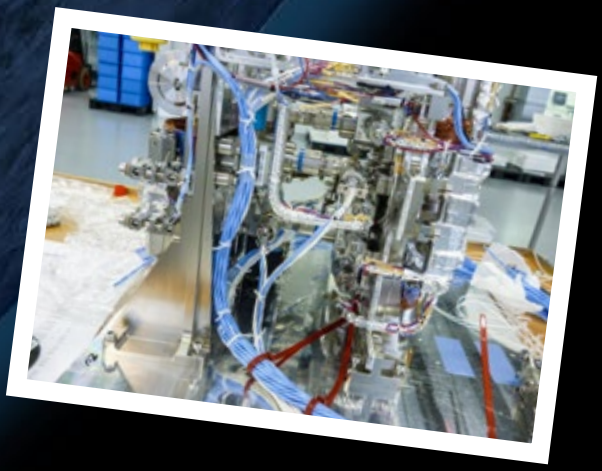
Interconnect / Electro-Mechanical Division fabricating space-grade interconnect technologies including HDRM (release nut) mechanisms

Satellite Test Division delivering turnkey Electronic Ground Support Equipment (EGSE) racks, harnesses, programming, protocols, and integration

Flight-Grade Harness division with turnkey Electrical Interface Control Document (EICD) generation, prototyping, and manufacturing

GLENAIR SPACE SYSTEMS IN-HOUSE PRODUCTION AND ASSEMBLY CAPABILITIES

Glenair Space Systems is a growing operation with an over 600 m^2 production floor. The facility also features 300 m^2 ISO 8 and ISO 6 clean rooms, ISO 5 flow chamber (certified to ESD Standard 61340-5-1), a large precision machining center, and ample clean room accommodation for large mock-up and integration projects.



Integration of production harnesses—in-house or at customer facility

ESA-certified engineering and production staff

3D mockup design, fabrication, and harness integration including in-house generation of all engineering and production files using Engineering Base

Turnkey satellite test harnesses and Electronic Ground Support Equipment racks

MISSION-CRITICAL

INTERCONNECT SOLUTIONS

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www.Glenair.com

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Telephone: 203-741-1115
Facsimile: 203-741-0053
sales@glenair.com

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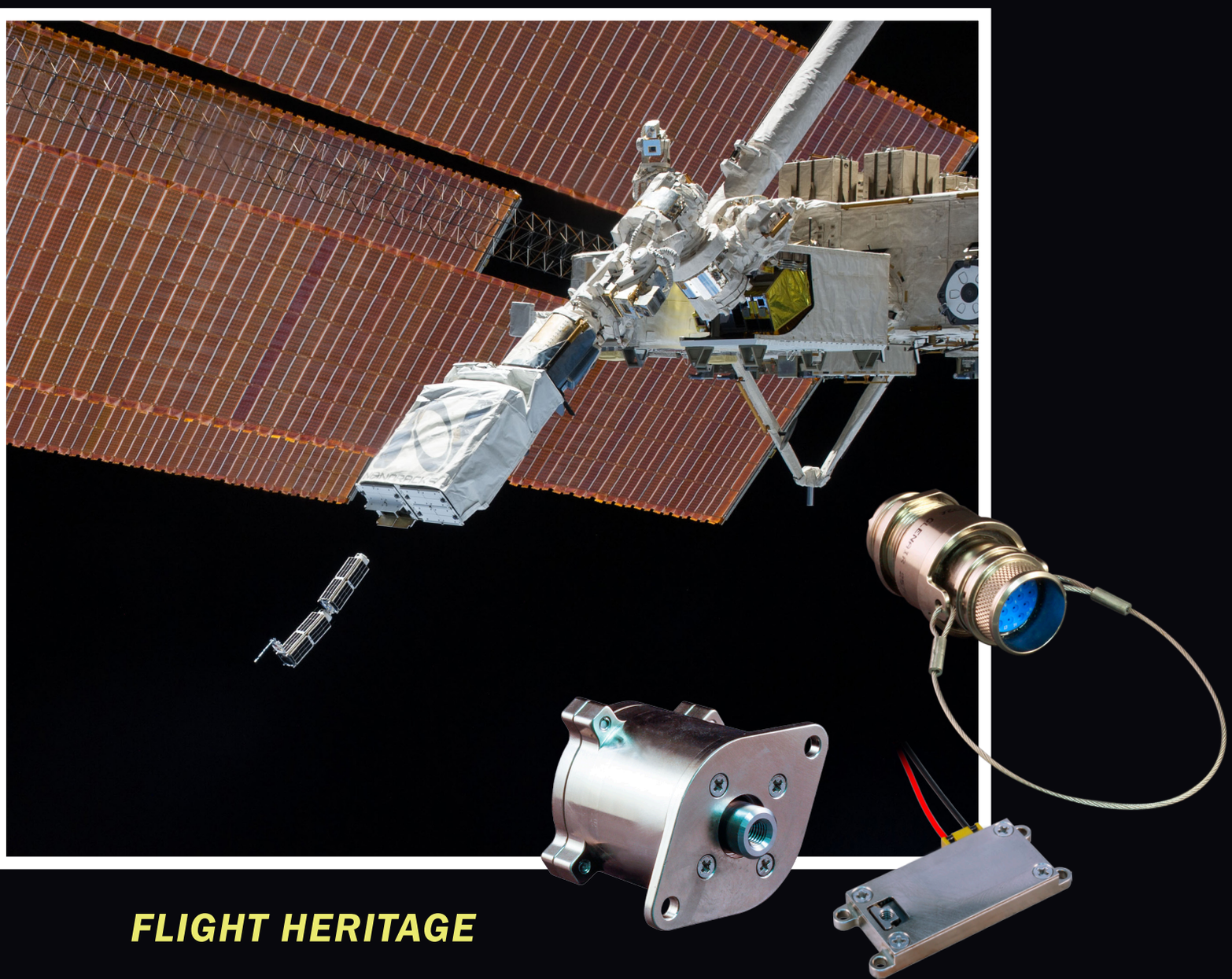
Glenair®



FLIGHT HERITAGE

SPACE MECHANISMS

Release Mechanisms · Blind Mate (ASF) Connectors · Lanyard-Release Connectors

AUGUST 2017

Glenair®

Commander Ed White on the first American spacewalk, 1965

SPACE PROVEN

Interconnect Technologies

We like to begin every discussion of Glenair's proven-performance space-grade products with the golden umbilical life support cable used by Commander Ed White in the first American space walk in 1965. This was a complex cable assembly with an exacting set of performance requirements. Even though this application is now over 50 years old, it still reflects Glenair's design and fabrication expertise and that we have been a go-to supplier for the space industry for over 5 decades.

Today we continue to manufacture a broad range of high-performance cables and components for space—from our innovative line of non-pyrotechnic HDRMs to high-reliability assisted separation force connectors. Glenair's proven space flight heritage includes interconnect and electromechanical technology on dozens of robotic spacecraft, including orbiters, landers, and rovers.

Many customers of discrete HDRM technology look to Glenair for the turnkey supply of interconnect wire and cabling. Non-pyrotechnic separation nuts utilize EMI shielded harness assemblies to supply primary and redundant initiation energy to the split spool actuator, and to transmit telemetry data from release sensors. Glenair operates the largest and best equipped wire harness assembly shop in the mission-critical interconnect industry and has supplied countless turnkey space-grade cable assemblies of this type.

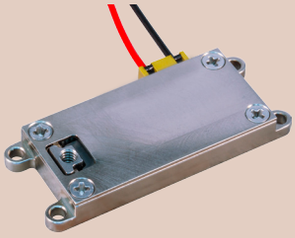
PROVEN PERFORMANCE IN SPACE

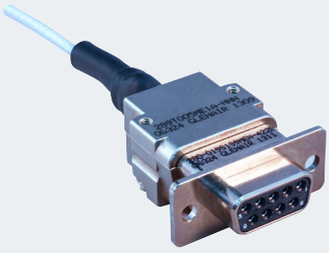
- The "Golden Umbilical" life-support cable
- JPL Mars probes (orbiters, landers, and the Curiosity rover)
- AIRS satellite
- Gravity Probe mission
- Titan II launch vehicles
- EADS Astrium
- ESA Ariane 5
- Countless others

FLIGHT HERITAGE

Space Mechanisms

For interconnection and release applications
Table of contents



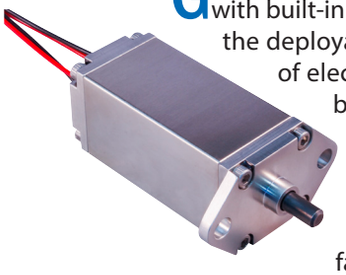


NASA NanoRack CubeSats deployed from the International Space Station. The ISS solar array panels provide the backdrop.

SERIES 06

Pyrotechnic-Free Space Mechanisms

High-reliability, non-explosive (split-spool) separation nuts and electromechanical release mechanisms for dependable stowage and release of deployable space systems



Glenair space mechanisms are optimized for foolproof release reliability with built-in mechanical and electrical redundancy. The planned release of the deployable satellite/payload is activated by a pre-determined value of electrical current to a fuse-wire system which causes the wire to break under tension and allows a pre-loaded mechanical bolt to actuate. Glenair's line of low-shock, redundant and non-redundant space mechanims includes both HDRM devices as well as a family of pin pushers and pin pullers. Customer-defined housing and mounting configurations are available. Consult factory for specific device TR level and qualification test reports.

Glenair pyrotechnic-free release mechanisms offer quick release time, low shock, relatively low power input, and virtually no temperature sensitivity. Glenair family of Space Mechanisms include separation nuts, HDRMs, pin pushers, and pin pullers which deliver a higher preload carrying capacity in comparison to similar devices.

- **Pyrotechnic-free alternative for single-event release of deployable space systems**
- **User-serviceable and refurbishable units**
- **Standard catalog as well as custom designs**
- **Not susceptible to transient and noise (EMI/EMP/ESD/RFI) inputs**
- **Extended temperature ranges: -150°C to +150°C**

Non-Explosive Space Mechanisms

HDRM, pin puller, and pin pusher selection guide

Pyrotechnic-Free Space Mechanisms

Technology overview

A

Glenair non-pyrotechnic space mechanism technology is based on a fusable wire-actuated separation nut design. Increasingly popular for its reliability and non-pyrotechnic action, fusable wire-actuated nut technology has the added benefit of being partially reusable and refurbishable post-deployment. Glenair HDRMs, pin pullers and pushers are immune to all forms of EMI or ESD, and capable of easily sustaining launch loads as well as defined preloads—with release deployment times comparable to conventional explosive actuators, but with low-shock and low power input.

A broad range of hold down release mechanism technologies have been historically used to hold secure and subsequently deploy satellites and other appendages (solar arrays, antenna reflectors, radiators, instruments, doors, sensors, booms, and so on) in space. Most of these technologies relied on non-reusable (explosive/pyrotechnic) designs that suffered from a broad range of deficiencies, including susceptibility to electromagnetic interference, problematic synchronization of release with mission requirements, high-shock release action, and significantly, the inability to reuse or refurbish the device during test. Historically, actuators and release devices of this type have included explosive release nuts, bolt cutters, separation nuts, and wire and pyro cable cutters

Glenair has taken a different path in the development of non-explosive HDRMs and other space mechanisms with a consumable initiator which, post-actuation, allows the device to be refurbished and reset on-site, or at the factory. Glenair fusable wire-actuated nut technology solves all of the problems associated with conventional explosive hold down and release devices.

Glenair family of pin pushers and pin pullers are low-shock mechanisms comprised of a spring-loaded pin held in place using the same fusable wire-actuated technology found in our hold down release mechanisms. Once actuated the restraining fuse wire breaks under tension causing the pin to retract under the force of the drive spring. The effects from the release of any potential energy in the loaded spring during actuation are countered by a measured delivery system to limit the effects of shock.

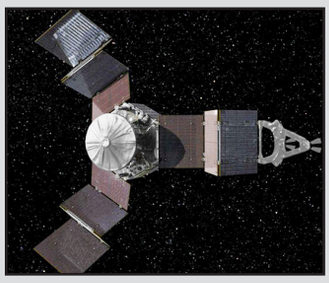
All three key components of Glenair space mechanisms (preloading assembly, release actuator, and load-carrying structure) may be packaged according to specific customer requirements including connectorization in place of wire leads. Packaging options include cylindrical or rectangular housings, lightweight materials, unique shapes and profiles, non-standard mounting dimensions and more. Consult the factory for complete information and TR Level qualification test reports.

SCALABLE DESIGNS: FROM CUBESATS TO 20,000 POUND PAYLOADS

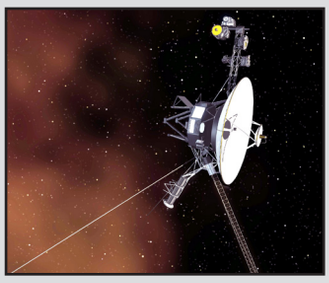
- **Fuse-wire based technology**
- **Redundant or non-redundant actuation circuit**
- **Space-rated and screened materials**
- **Electrical initiation up to 5 amps**

Build-to-spec solutions also available, including connectorized HDRMs, band porch shield termination feed-thrus and power draw resistors. Connectorized Solution above shown with Series 806 Mighty Mouse

DEPLOYMENT APPLICATIONS

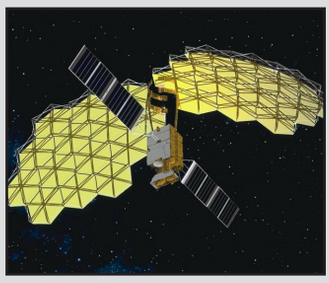


Solar Arrays



Booms and Masts

Antennas

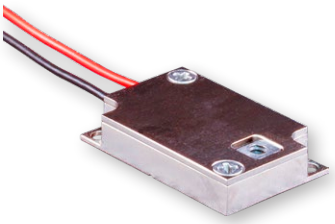


Reflectors

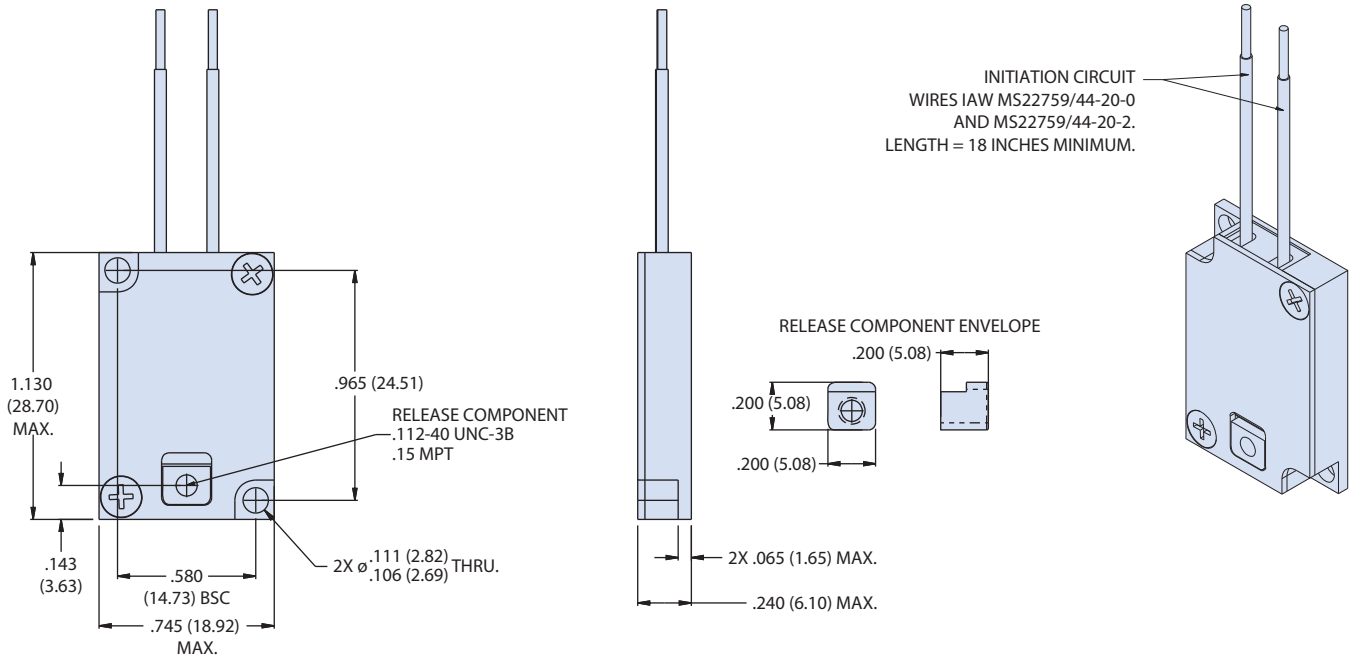
Light-duty hold-down release mechanism

5 lb. (Delrin) or 20 lb. (Stainless Steel) release preload
Non-redundant circuit

NON-REDUNDANT CIRCUIT HOLD DOWN RELEASE MECHANISM, LIGHT DUTY



How To Order			
Sample Part No.	**061**	**-002**	**-S**
Basic Part No.	Light/Medium Duty HDRM		
Dash No.	Non-Redundant Circuit		
Release Component Material	**S** - Stainless Steel **D** - Delrin		



NOTES

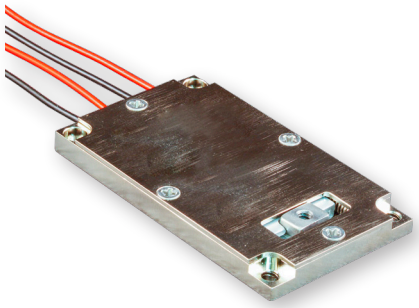
1. Unit is identified with Glenair name, CAGE code, part number, and date code, space permitting.
2. Release preload:
   Stainless steel release component: max. limit 20 lbs (89 N)
   Delrin release component: max. limit 5 lbs (22 N)
3. Full qualification pending
4. Reference Glenair P/N 060-102 for refurbishment initiator
5. Metric threads available, consult factory for options

Physical characteristics	
Mass	9 grams nominal weight
Release component thread	0.112-40 UNC-3B*
Material list	IAW MSFC-STD-3029
Epoxy	Outgassing requirements per GSC19384
Device features	
Field refurbishable	Initiator can be replaced in less than 15 minutes by trained personnel
Packaging	External housing typically supplied with two mounting points. Custom housings and mountings available
Connectorization	Standard design supplied with wire inputs. Consult factory for connectorization options
Scalable bolt size	Bolt size determines preload and can be scaled to accommodate a wide range of requirements
*Size callout based on the bolt size to be used. Metric thread also available. Consult factory for qualification test report.	

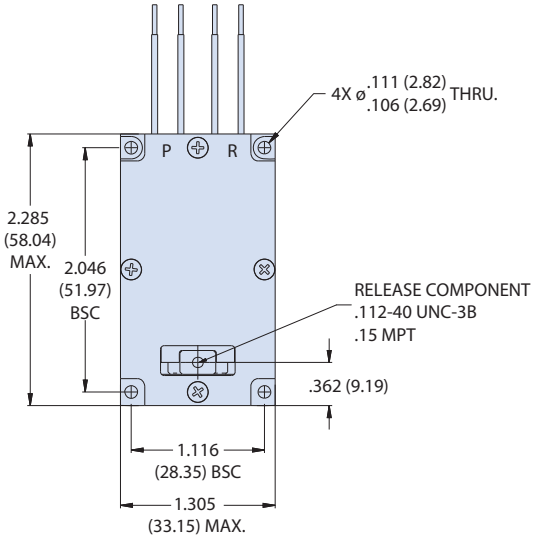
Light-duty hold-down release mechanisms

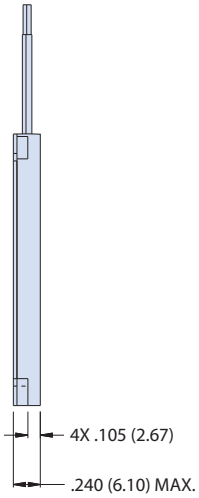
30 lb. (Stainless Steel) release preload
Electrically Redundant

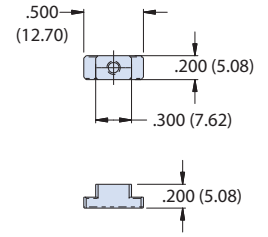
ELECTRICALLY REDUNDANT HOLD DOWN RELEASE MECHANISM, LIGHT DUTY

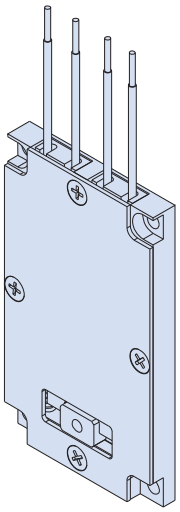


How To Order		
Sample Part No.	**061**	**-003**
Basic Part No.	Light/Medium Duty HDRM	
Dash No.	Redundant Circuit	









Physical characteristics	
Mass	27.8 grams nominal weight
Release component thread	0.112-40 UNC-3B*
Material list	IAW MSFC-STD-3029
Epoxy	Outgassing requirements per GSC19384
Device features	
Redundant initiation	2 initiation points
Field refurbishable	Initiator can be replaced in less than 15 minutes by trained personnel
Packaging	External housing typically supplied with two mounting points. Custom housings and mountings available
Connectorization	Standard design supplied with wire inputs. Consult factory for connectorization options
Scalable bolt size	Bolt size determines preload and can be scaled to accommodate a wide range of requirements
*Size callout based on the bolt size to be used. Metric thread also available. Consult factory for qualification test report.	

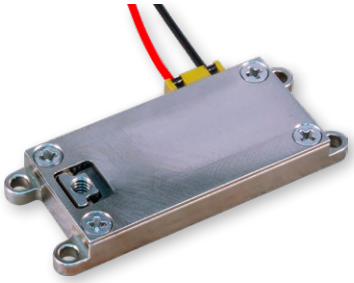
NOTES

1. Unit is identified with Glenair name, CAGE code, part number, and date code, space permitting. Primary initiation circuit identified with "P" and redundant with "R".
2. Release preload 30 lbs. (133 N)
3. Full qualification pending
4. Reference Glenair P/N 060-103 for refurbishment initiator
5. Metric threads available, consult factory for options

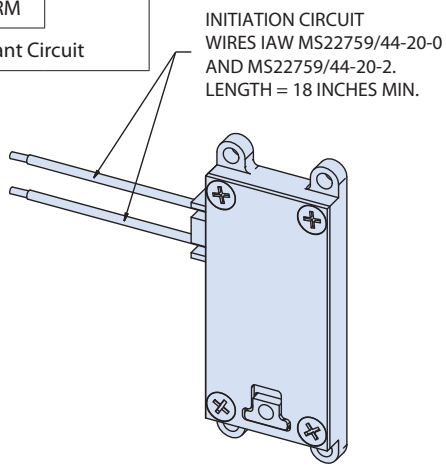
Light-duty hold-down release mechanism

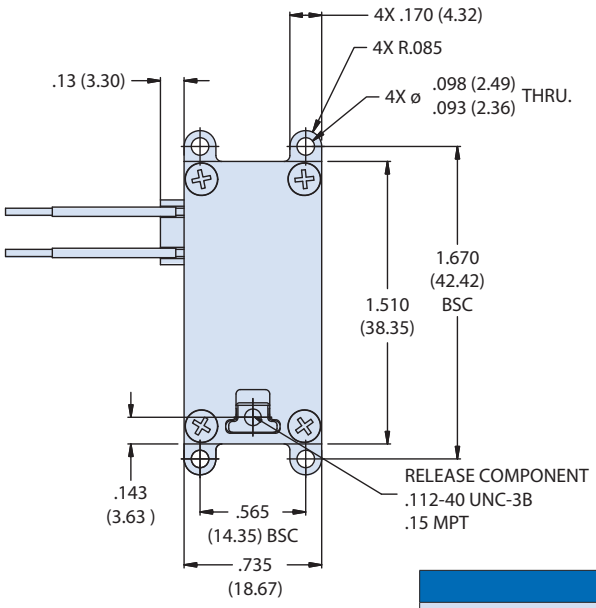
75 lb. release preload
Non-redundant circuit • side load

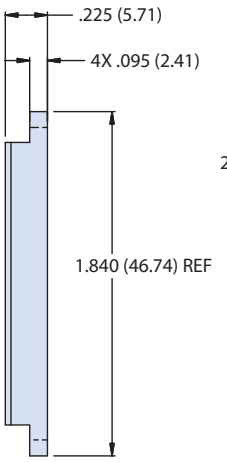
NON-REDUNDANT CIRCUIT HOLD DOWN RELEASE MECHANISM, LIGHT DUTY

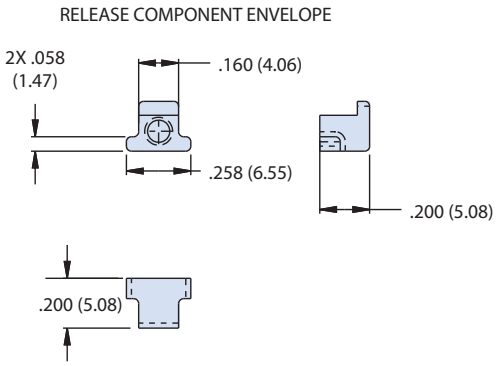


How To Order		
Sample Part No.	**061**	**-014**
Basic Part No.	Light/Medium Duty HDRM	
Dash No.	Side Load, Non-Redundant Circuit	









NOTES

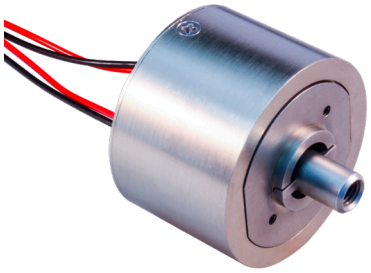
1. Unit is identified with Glenair name, CAGE code, part number, and date code, space permitting. Primary initiation circuit identified with "P" and redundant with "R".
2. Release preload: 75 lbs. (334N)
3. Full qualification complete, consult factory for test report.
4. Reference Glenair P/N 060-114 for refurbishment initiator
5. Metric threads available, consult factory for options

Physical characteristics	
Mass	20.6 grams approximate weight
Release component thread	0.115-40 UNC-3B*
Material list	IAW MSFC-STD-3029
Device features	
Field refurbishable	Initiator can be replaced in less than 15 minutes by trained personnel
Packaging	External housing typically supplied with two mounting points. Custom housings and mountings available
Connectorization	Standard design supplied with wire inputs. Consult factory for connectorization options
Scalable bolt size	Bolt size determines preload and can be scaled to accommodate a wide range of requirements
*Size callout based on the bolt size to be used. Metric thread also available. Consult factory for qualification test report.	

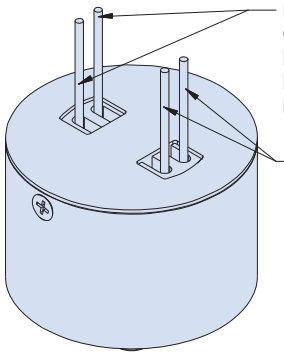
Medium-duty hold-down release mechanism

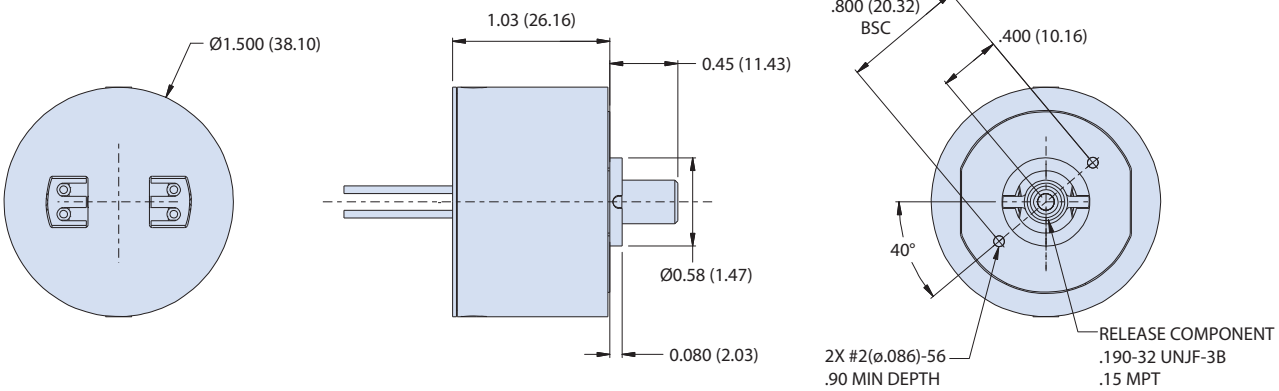
2500 lb. release preload
Electrically redundant

ELECTRICALLY REDUNDANT HOLD DOWN RELEASE MECHANISM, MEDIUM DUTY



How To Order		
Sample Part No.	**061**	**-005**
Basic Part No.	Light/Medium Duty HDRM	
Dash No.	Redundant Circuit	





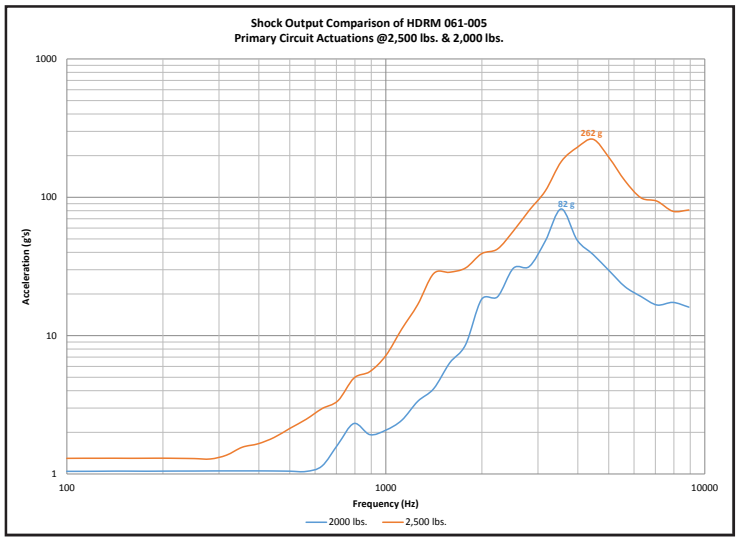
NOTES

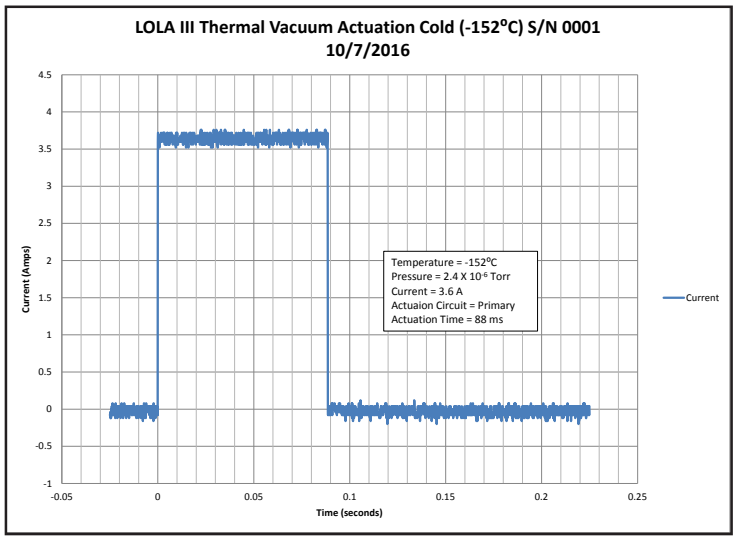
1. Unit is identified with Glenair name, CAGE code, part number, and date code, space permitting. Primary initiation circuit identified with "P" and redundant with "R".
2. Release preload 2500 lbs. (11.1 kN)
3. Reference Glenair P/N 060-105 for refurbishment initiator
4. Nominal actuation current 3.5 Amps
5. Metric threads available, consult factory for options

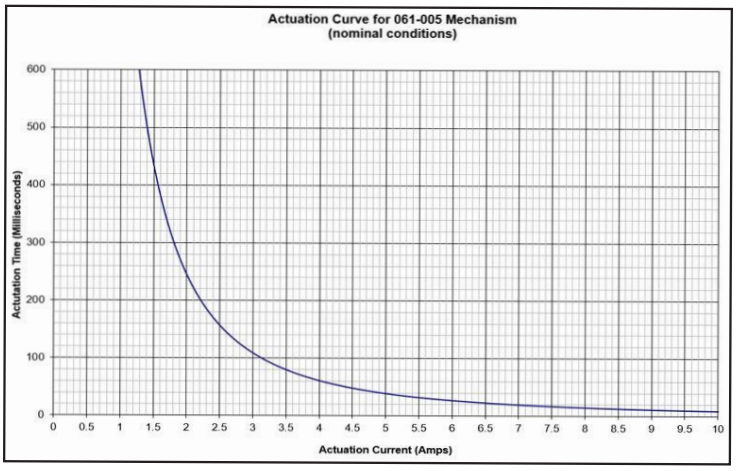
Physical characteristics	
Mass	74 grams nominal weight
Release component thread	0.190-32 UNJF-3B*
Material list	IAW MSFC-STD-3029
Epoxy	Outgassing requirements per GSC19384
Device features	
Redundant initiation	2 initiation points
Field refurbishable	Initiator can be replaced in less than 15 minutes by trained personnel
Reliability prediction	0.9999994
Packaging	External housing typically supplied with two mounting points. Custom housings and mountings available
Connectorization	Standard design supplied with wire inputs. Connectorized versions available
Scalable bolt size	Bolt size determines preload and can be scaled to accommodate a wide range of requirements
*Size callout based on the bolt size to be used. Metric thread also available. Consult factory for qualification test report.	

Medium-duty hold-down release mechanism

2500 lb. release preload
Summary of qualification test data





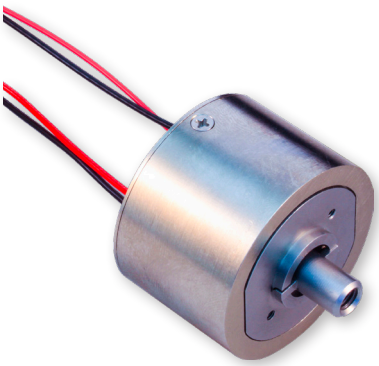


Tested Capability for 061-005	
Nominal Release Preload	2,250 pounds
Proof Preload	2,500 pounds
Ultimate Load	3,250 pounds
Electrical Resistance	1.5 ohms max
Sine Vibration 3 orthogonal axes	25 G's
Random Vibration 3 orthogonal axes	50.9 G_{rms}
Actuation Time	Under 100 ms @3.5 Amps
Shock Input	2,849 G's
Source Shock	Under 300 G's @2,500 pounds
Life Test	10 refurbishments during qualification and an expected continued usage
Temperature	-150°C to +150°C released in a vacuum (1x10-6 Torr)
Extended Preload	<4.0% loss

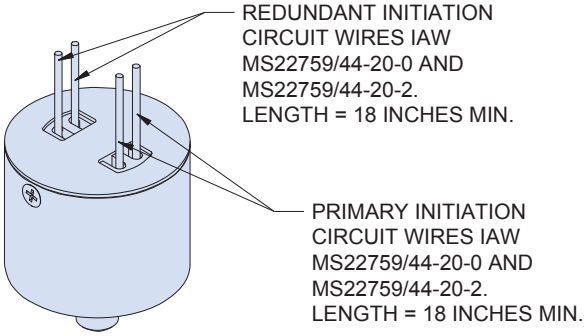
Medium-duty hold-down release mechanism

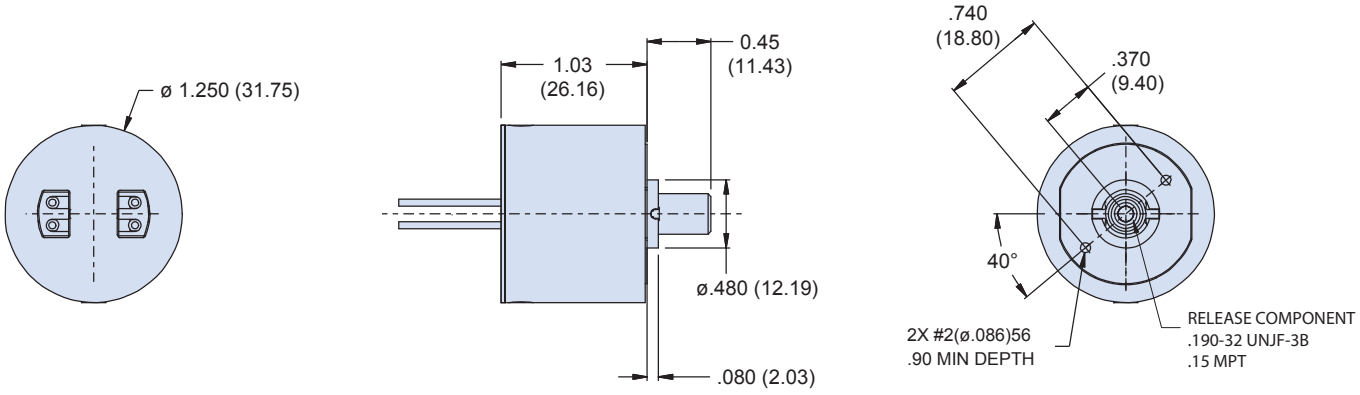
1000 lb. release preload
Electrically redundant

ELECTRICALLY REDUNDANT HOLD DOWN RELEASE MECHANISM, MEDIUM DUTY



How To Order		
Sample Part No.	**061**	**-006**
Basic Part No.	Light/Medium Duty HDRM	
Dash No.	Redundant Circuit	





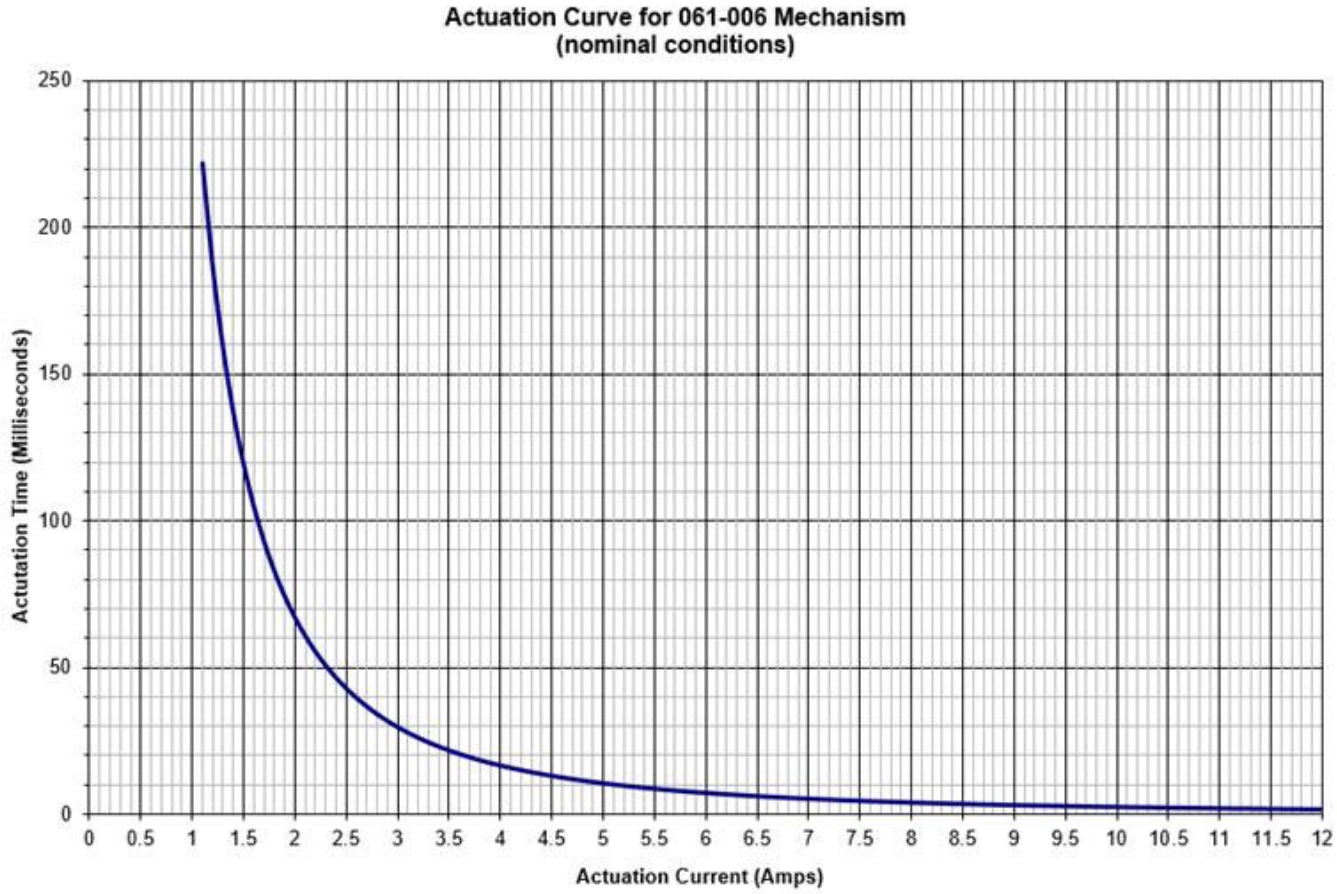
NOTES

1. Unit is identified with Glenair name, CAGE code, part number, and date code, space permitting. Primary initiation circuit identified with "P" and redundant with "R".
2. Release preload 1000 lbs. (4.5 kN) on similar model, contact factory
3. Qualification complete
4. Reference Glenair P/N 060-106 for refurbishment initiator
5. Metric threads available, consult factory for options

Physical characteristics	
Mass	45.2 grams approximate weight
Release component thread	0.190-32 UNJF-3B*
Material list	IAW MSFC-STD-3029
Epoxy	Outgassing requirements per GSC19384
Device features	
Redundant initiation	2 initiation points
Field refurbishable	Initiator can be replaced in less than 15 minutes by trained personnel
Reliability prediction	0.9999994 (based off scaled design)
Packaging	External housing typically supplied with two mounting points. Custom housings and mountings available
Connectorization	Standard design supplied with wire inputs. Connectorized versions available
Scalable bolt size	Bolt size determines preload and can be scaled to accommodate a wide range of requirements
*Size callout based on the bolt size to be used. Metric thread also available. Consult factory for qualification test report.	

Medium-duty hold-down release mechanism

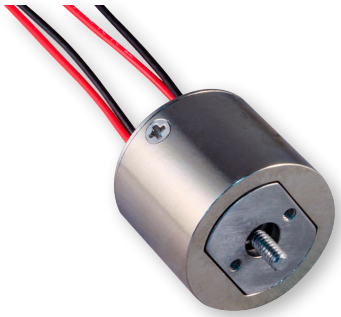
1000 lb. release preload
Actuation curve



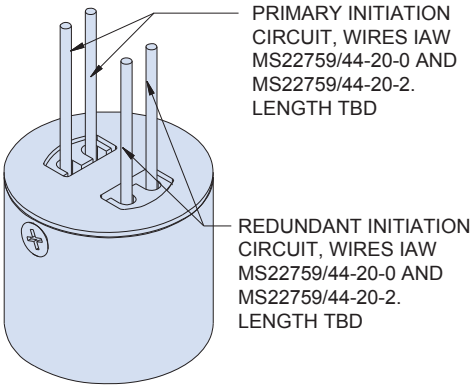
Medium-duty hold-down release mechanism

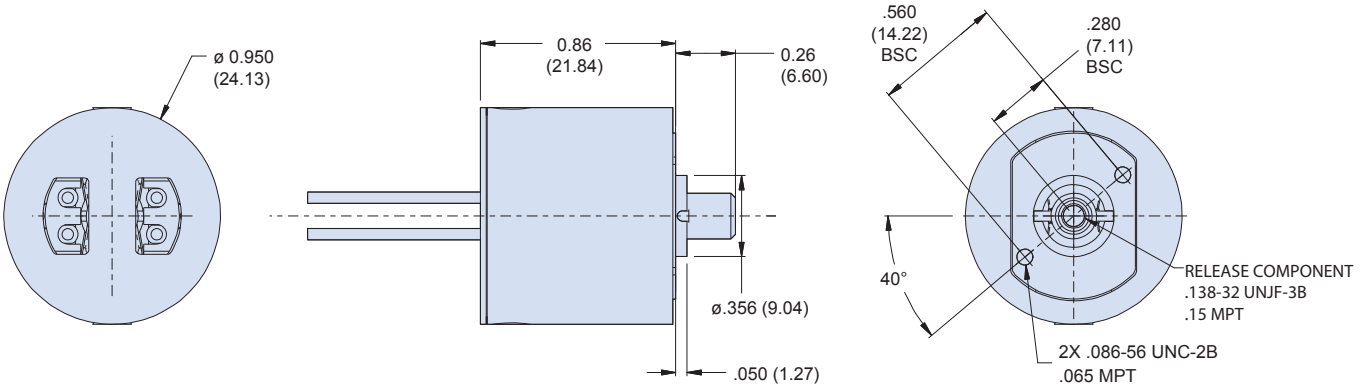
300 lb. release preload
Electrically redundant

ELECTRICALLY REDUNDANT HOLD DOWN RELEASE MECHANISM, MEDIUM DUTY



How To Order		
Sample Part No.	**061**	**-007**
Basic Part No.	Light/Medium Duty HDRM	
Dash No.	Redundant Circuit	





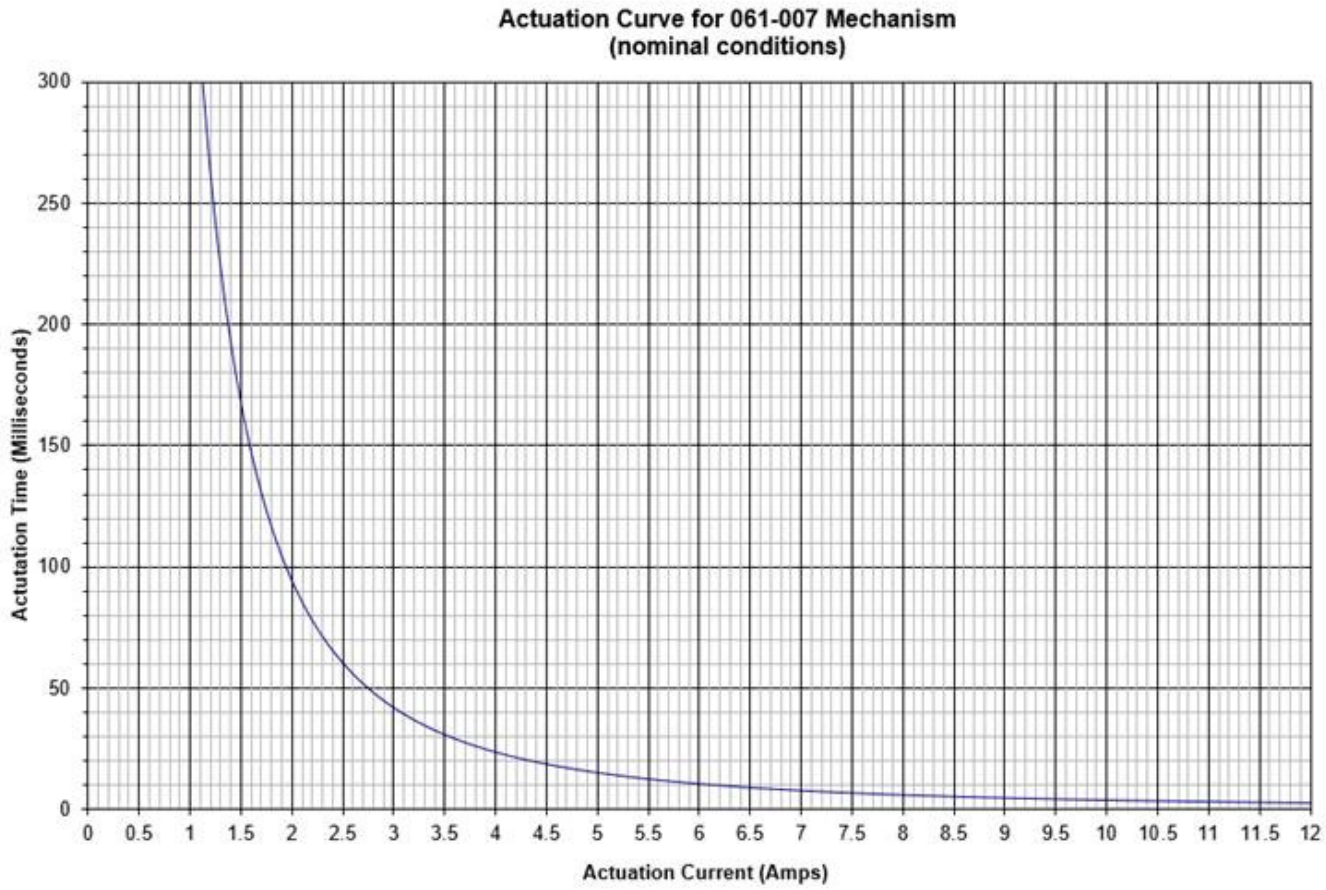
Physical characteristics	
Mass	24.8 grams approximate weight
Release component thread	0.138-32 UNJF-3B*
Material list	IAW MSFC-STD-3029
Epoxy	Outgassing requirements per GSC19384
Device features	
Redundant initiation	2 initiation points
Field refurbishable	Initiator can be replaced in less than 15 minutes by trained personnel
Reliability prediction	0.9999994 (based off scaled design)
Packaging	External housing typically supplied with two mounting points. Custom housings and mountings available
Connectorization	Standard design supplied with wire inputs. Connectorized versions available
Scalable bolt size	Bolt size determines preload and can be scaled to accommodate a wide range of requirements
*Size callout based on the bolt size to be used. Metric thread also available. Consult factory for qualification test report.	

NOTES

1. Unit is identified with Glenair name, CAGE code, part number, and date code, space permitting. Primary initiation circuit identified with "P" and redundant with "R".
2. Release preload 300 lbs. (1.33 kN)
3. Full qualification pending
4. Reference Glenair P/N 060-107 for refurbishment initiator
5. Metric threads available, consult factory for options

Medium-duty hold-down release mechanism

300 lb. release preload
Actuation curve

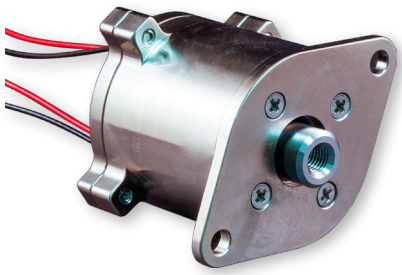


Heavy-duty hold-down release mechanism

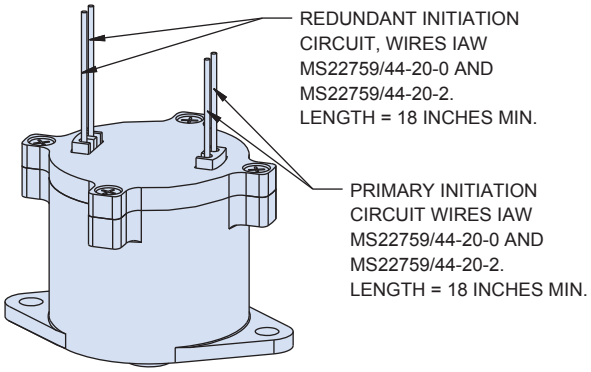
5000 lb. release preload
Electrically redundant

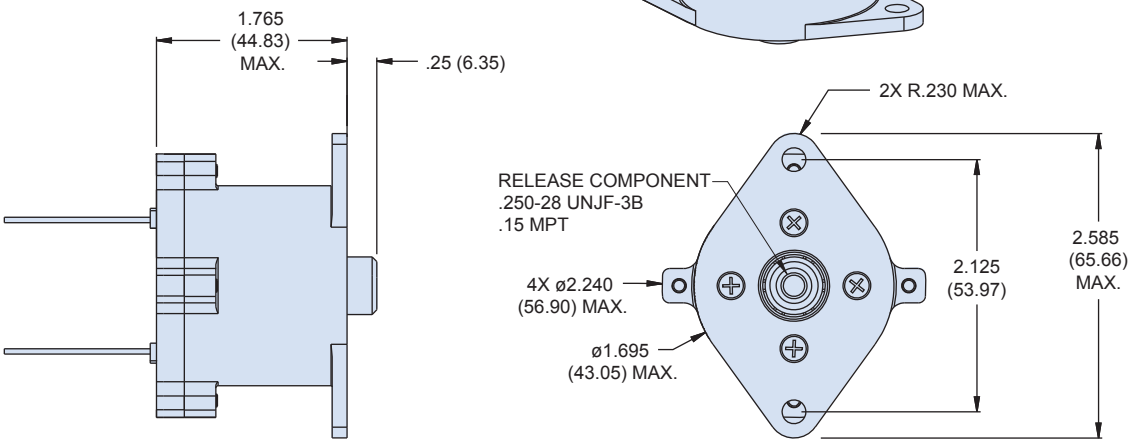
A

ELECTRICALLY REDUNDANT HOLD DOWN RELEASE MECHANISM, HEAVY DUTY



How To Order		
Sample Part No.	**062**	**-002**
Basic Part No.	Heavy Duty HDRM	
Dash No.	Redundant Circuit	



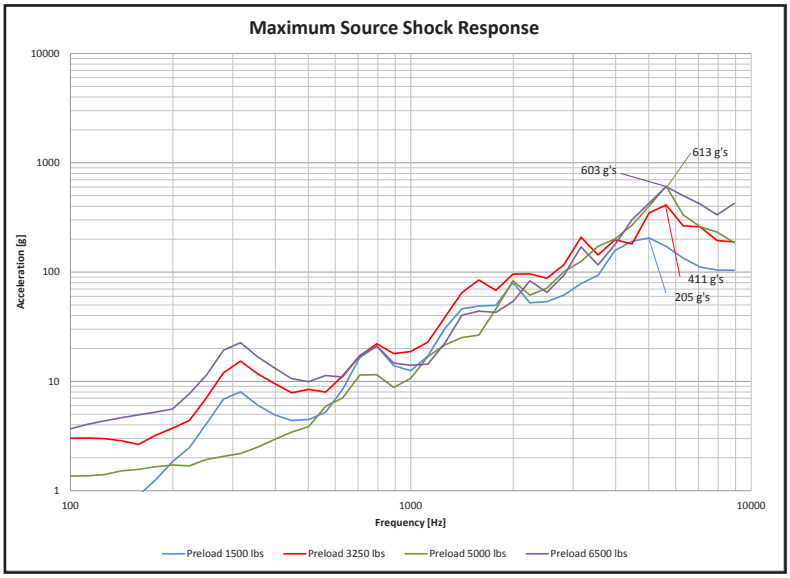


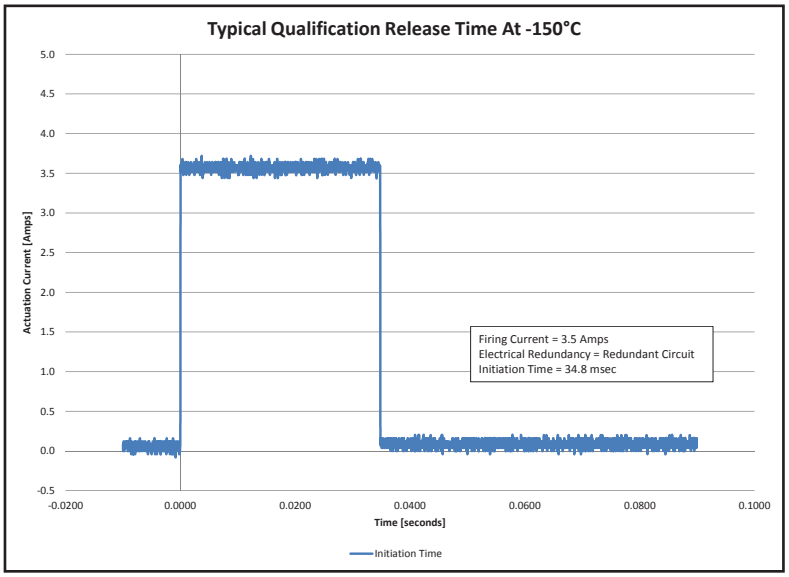
Available 069-201 mechanical release for use in place of refurbishment initiator. Consult factory for application notes.

Physical characteristics	
Mass	241 grams nominal weight with 18 inch lead wire included
Release component thread	0.250-28 UNJF-3B*
Material list	IAW MSFC-STD-3029
Epoxy	Outgassing requirements per GSC19384
Device features	
Redundant initiation	2 initiation points
Field refurbishable	Initiator can be replaced in less than 15 minutes by trained personnel
Reliability prediction	0.9999995
Packaging	External housing typically supplied with two mounting points. Custom housings and mountings available
Connectorization	Standard design supplied with wire inputs. Connectorized versions available
Scalable bolt size	Bolt size determines preload and can be scaled to accommodate a wide range of requirements
*Size callout based on the bolt size to be used. Metric thread also available. Complete test report available upon request	

Heavy-duty hold-down release mechanism

5000 lb. release preload
Summary of qualification test data





NOTES

1. Unit is identified with Glenair name, CAGE code, part number, and date code, space permitting. Primary initiation circuit identified with "P" and redundant with "R".
2. Release preload 5000 lbs. (22.4 kN)
3. Reference Glenair P/N 060-202 for refurbishment initiator
4. Qualification test complete
5. Metric threads available, consult factory for options

Tested capability for ¼ inch unit*	
Nominal Release Preload	5,000 pounds
Proof Preload	6,500 pounds
Ultimate Load	8,000 pounds
Electrical resistance	1.50 ohms Max
Random vibration: 3 orthogonal axes	50.9 G_{rms}
Sine vibration: 3 orthogonal axes	25 G's
Actuation time	Under 45 ms @ 3.5 Amps
Source shock	Under 625 G's @ 5,000 pounds
Life test	10 refurbishments during qualification and an expected continued usage
Temperature	-150°C to +150°C released in a vacuum ($1x10^{-6}$ Torr)
*The size callout is based off the bolt size that is to be used. Metric thread can also be called out. Complete test report available upon request	

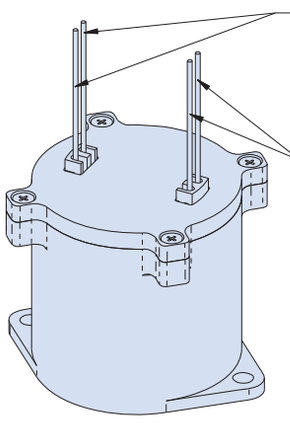
Heavy-duty hold-down release mechanisms

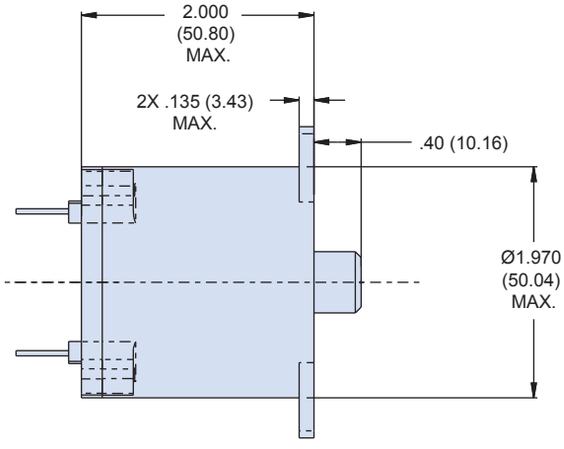
8750 lb. release preload
Redundant circuit

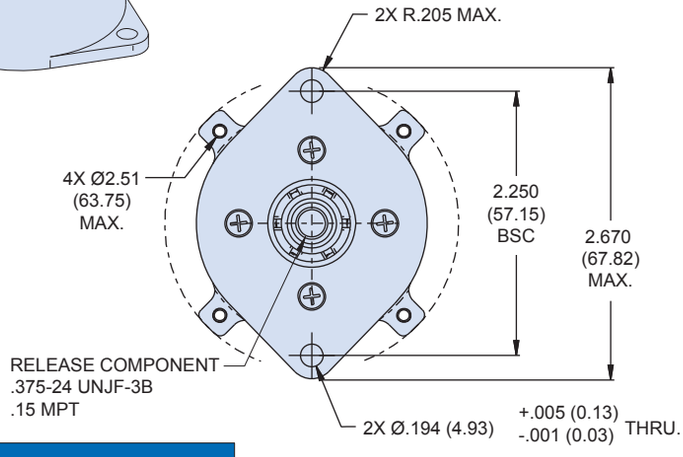
A

REDUNDANT CIRCUIT HOLD DOWN RELEASE MECHANISM, HEAVY DUTY

How To Order		
Sample Part No.	**063**	**-001**
Basic Part No.	Heavy Duty HDRM	
Dash No.	Redundant Circuit	







Physical characteristics	
Mass	335 grams approximate weight
Bolt	0.375-24 UNJF-3B*
Material list	IAW MSFC-STD-3029
Epoxy	Outgassing requirements per GSC19384
Device features	
Redundant initiation	2 initiation points
Field refurbishable	Initiator can be replaced in less than 15 minutes by trained personnel
Reliability prediction	0.9999995 (based off scaled design)
Packaging	External housing typically supplied with two mounting points. Custom housings and mountings available
Connectorization	Standard design supplied with wire inputs. Connectorized versions available
Scalable bolt size	Bolt size determines preload and can be scaled to accommodate a wide range of requirements
*Size callout based on the bolt size to be used. Metric thread also available. Consult factory for qualification test report.	

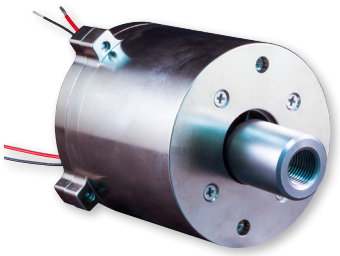
NOTES

1. Unit is identified with Glenair name, CAGE code, part number, and date code, space permitting. Primary initiation circuit identified with "P" and redundant with "R".
2. Release preload: 8,750 lbs. (38.9 kN) Proof load: 12500 lbs. (55.6 kN) Ultimate preload: 16500 lbs. (73.4 kN) min.
3. Full qualification pending
4. Reference Glenair P/N 060-301 for refurbishment initiator
5. Metric threads available, consult factory for options

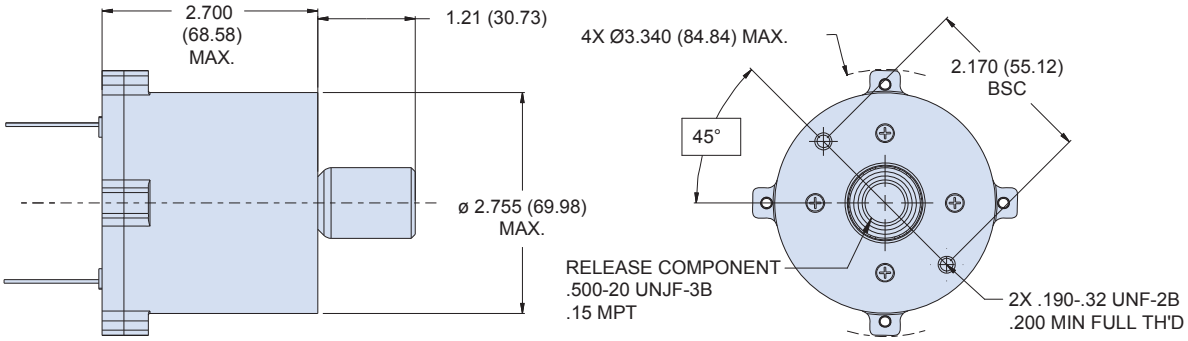
Heavy-duty hold-down release mechanisms

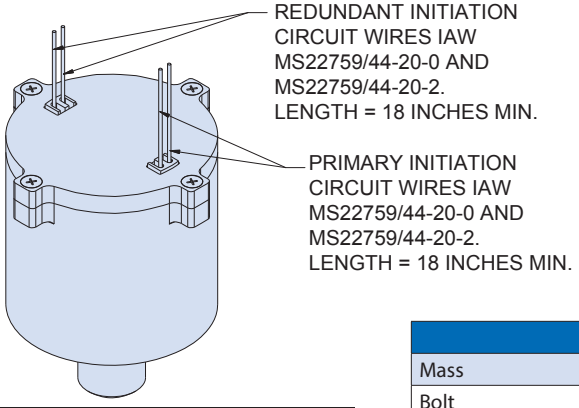
20,000 lb. release preload
Electrically redundant

ELECTRICALLY REDUNDANT HOLD DOWN RELEASE MECHANISM, HEAVY DUTY



How To Order		
Sample Part No.	**064**	**-001**
Basic Part No.	Heavy Duty HDRM	
Dash No.	Redundant Circuit	





Available 069-401 mechanical release for use in place of refurbishment initiator. Consult factory for application notes.

NOTES

1. Unit is identified with Glenair name, CAGE code, part number, and date code, space permitting. Primary initiation circuit identified with "P" and redundant with "R".
2. Release preload 20,000 lbs. (88.9 kN)
3. Full qualification pending
4. Reference Glenair P/N 060-401 for refurbishment initiator
5. Metric threads available, consult factory for options

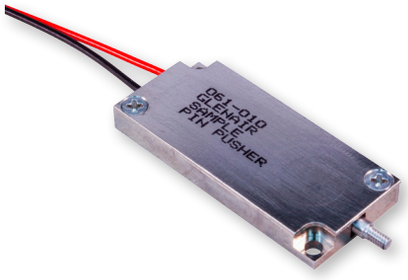
Physical characteristics	
Mass	870.4 grams nominal weight
Bolt	.500-20 UNJF-3B*
Material list	IAW MSFC-STD-3029
Epoxy	Outgassing requirements per GSC19384
Device features	
Redundant initiation	2 initiation points
Field refurbishable	Initiator can be replaced in less than 15 minutes by trained personnel
Reliability prediction	0.9999995 (based off scaled design)
Packaging	External housing typically supplied with two mounting points. Custom housings and mountings available
Connectorization	Standard design supplied with wire inputs. Connectorized versions available
Scalable bolt size	Bolt size determines preload and can be scaled to accommodate a wide range of requirements
*Size callout based on the bolt size to be used. Metric thread also available. Consult factory for complete test report	

Light-duty pin pushers and pullers

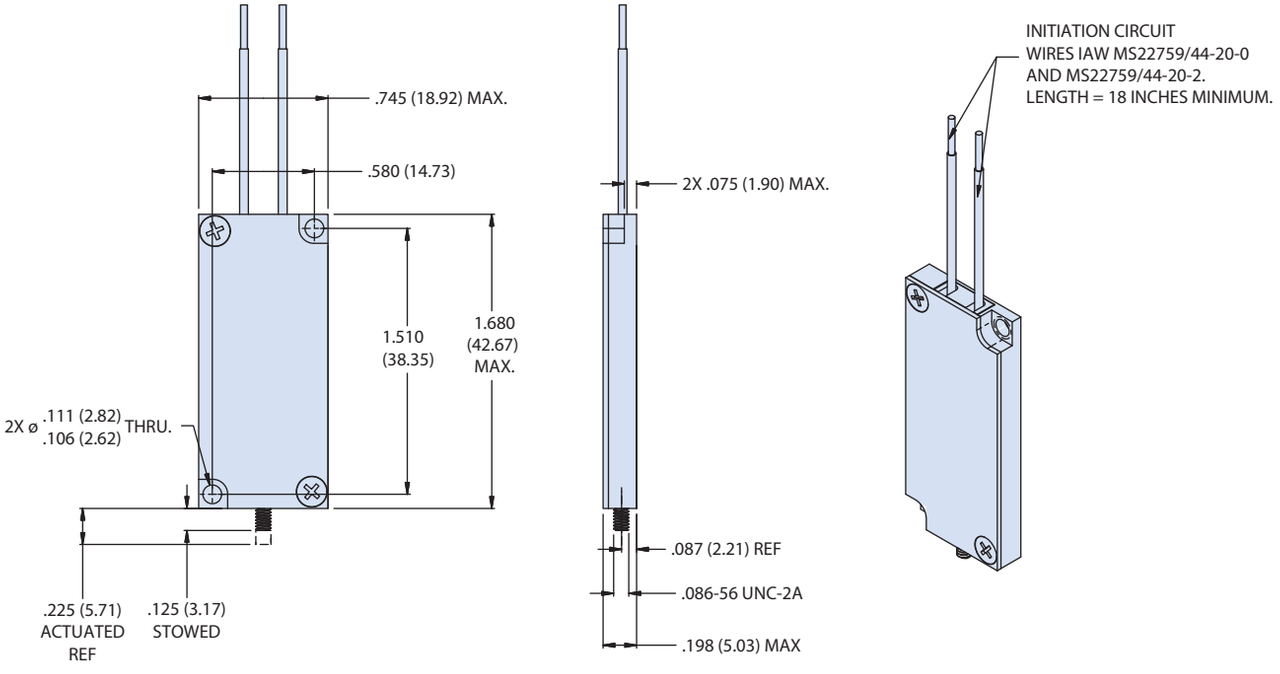
6 lb. push force
Non-redundant circuit

A

NON-REDUNDANT CIRCUIT PIN PUSHER MECHANISM, LIGHT DUTY



How To Order		
Sample Part No.	**061**	**-010**
Basic Part No.	Light-Duty Pin Pusher	
Dash No.	Non-Redundant Circuit	



NOTES

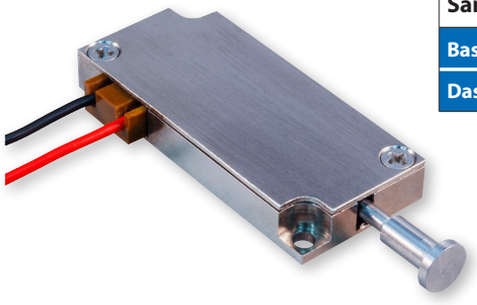
1. Unit is identified with Glenair name, CAGE code, part number, and date code, space permitting.
2. Push load: 6 lbs. (26.7 N)
3. Full qualification pending
4. Reference Glenair P/N 060-711 for refurbishment initiator
5. Metric threads available, consult factory for options

Physical characteristics	
Mass	15.2 grams approximate weight
Material list	IAW MSFC-STD-3029
Device features	
Field refurbishable	Initiator can be replaced in less than 15 minutes by trained personnel
Packaging	External housing typically supplied with two mounting points. Custom housings and mountings available
*Size callout based on the bolt size to be used. Metric thread also available. Consult factory for qualification test report.	

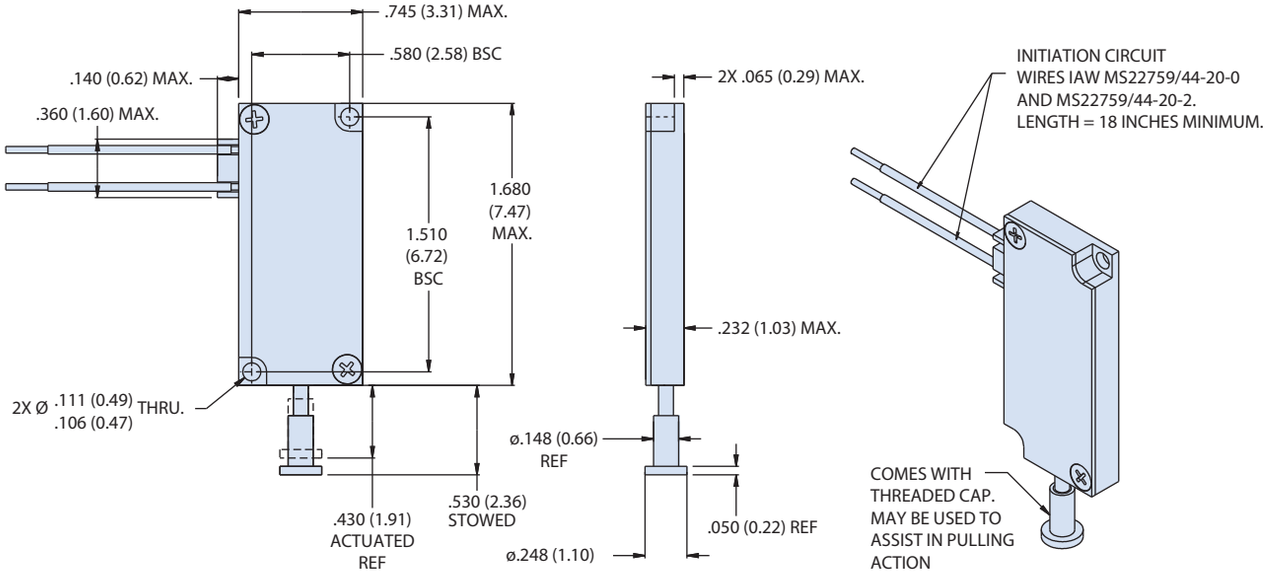
Light-duty pin pushers and pullers

18 lb. pull force
Non-redundant circuit

NON-REDUNDANT CIRCUIT PIN PULLER MECHANISM, LIGHT DUTY



How To Order		
Sample Part No.	**061**	**-009**
Basic Part No.	LIght-Duty Pin Puller	
Dash No.	Non-Redundant Circuit	



NOTES

1. Unit is identified with Glenair name, CAGE code, part number, and date code, space permitting.
2. Release preload 18 lbs. (80 N)
3. Full qualification pending
4. Reference Glenair P/N 060-109 for refurbishment initiator
5. Metric threads available, consult factory for options

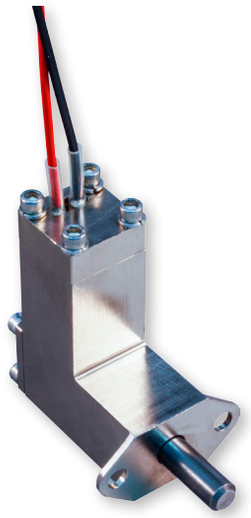
Physical characteristics	
Mass	16.2 grams nominal weight
Material list	IAW MSFC-STD-3029
Epoxy	Outgassing requirements per GSC19384
Device features	
Field refurbishable	Initiator can be replaced in less than 15 minutes by trained personnel
Packaging	External housing typically supplied with two mounting points. Custom housings and mountings available
Scalable bolt size	Bolt size determines preload and can be scaled to accommodate a wide range of requirements
*Size callout based on the bolt size to be used. Metric thread also available. Consult factory for complete test report	

Light-duty pin pushers and pullers

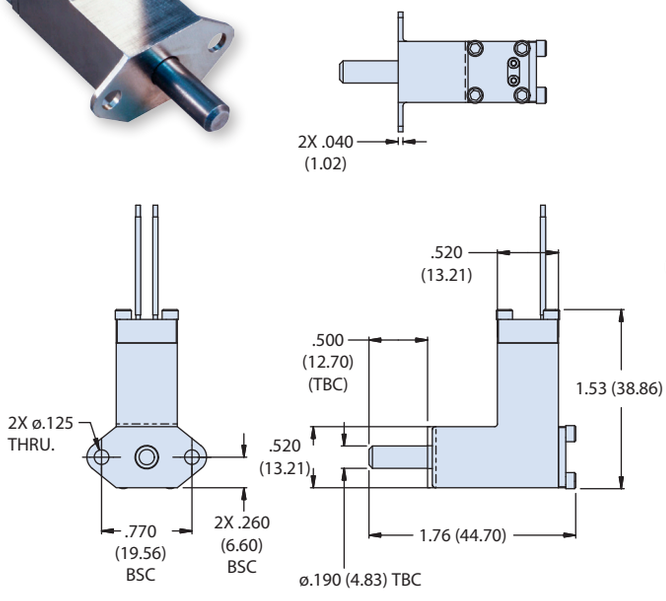
18 lb. pull force
Non-redundant circuit

A

NON-REDUNDANT CIRCUIT PIN PULLER MECHANISM, LIGHT DUTY



How To Order		
Sample Part No.	**061**	**-011**
Basic Part No.	Light-Duty Pin Puller	
Dash No.	Non-Redundant Circuit	



NOTES

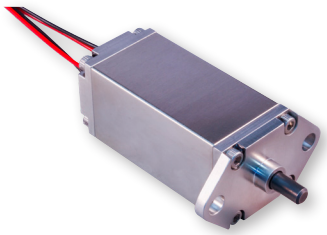
1. Unit is identified with Glenair name, CAGE code, part number, and date code, space permitting.
2. Release preload: 18 lbs. (80.1 N) (TBC)
3. Full qualification pending
4. Reference Glenair P/N 060-112 for refurbishment initiator

Physical characteristics	
Mass	34.8 grams approximate weight
Material list	IAW MSFC-STD-3029
Device features	
Field refurbishable	Initiator can be replaced in less than 15 minutes by trained personnel
Packaging	External housing typically supplied with two mounting points. Custom housings and mountings available
Connectorization	Standard design supplied with wire inputs. Connectorized versions available
*Size callout based on the bolt size to be used. Metric thread also available. Consult factory for qualification test report.	

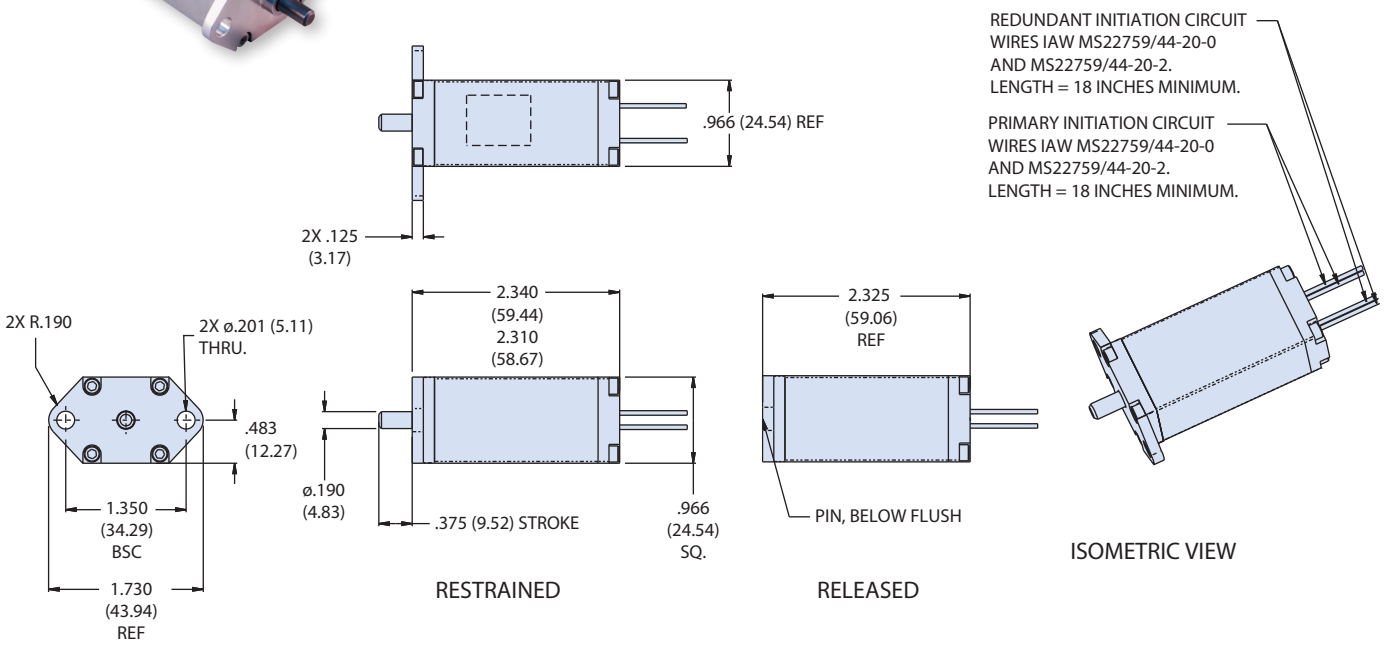
Medium-duty pin pushers and pullers

50 lb. pull force
Electrically redundant

ELECTRICALLY REDUNDANT PIN PULLER MECHANISM, MEDIUM DUTY



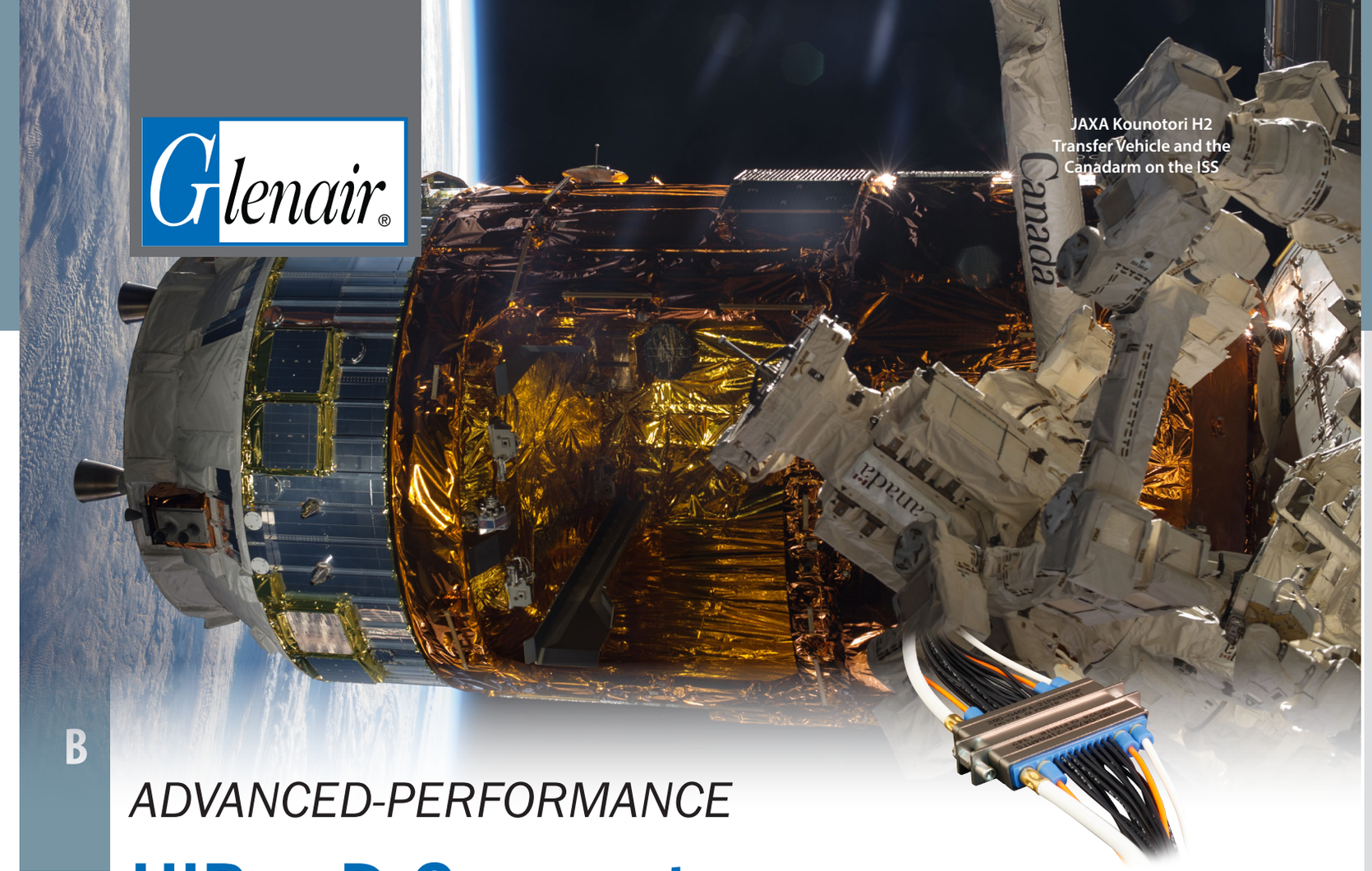
How To Order		
Sample Part No.	**061**	**-013**
Basic Part No.	Medium-Duty Pin Puller	
Dash No.	Redundant Circuit	



NOTES

1. Unit is identified with Glenair name, CAGE code, part number, and date code, space permitting. Primary initiation circuit identified with "P" and redundant with "R".
2. Pull force: 50 lbs. (222 N)
3. Full qualification pending
4. Reference Glenair P/N 060-711 for refurbishment initiator
5. Metric threads available, consult factory for options

Physical characteristics	
Mass	145.8 grams approximate weight
Material list	IAW MSFC-STD-3029
Device features	
Redundant initiation	2 initiation points
Field refurbishable	Initiator can be replaced in less than 15 minutes by trained personnel
Packaging	External housing typically supplied with two mounting points. Custom housings and mountings available
Connectorization	Standard design supplied with wire inputs. Connectorized versions available
*Size callout based on the bolt size to be used. Metric thread also available. Consult factory for qualification test report.	



JAXA Kounotori H2 Transfer Vehicle and the Canadarm on the ISS

B

ADVANCED-PERFORMANCE

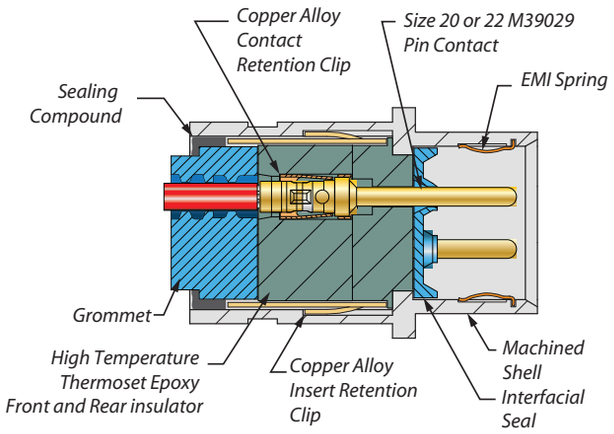
HiPer-D Connectors

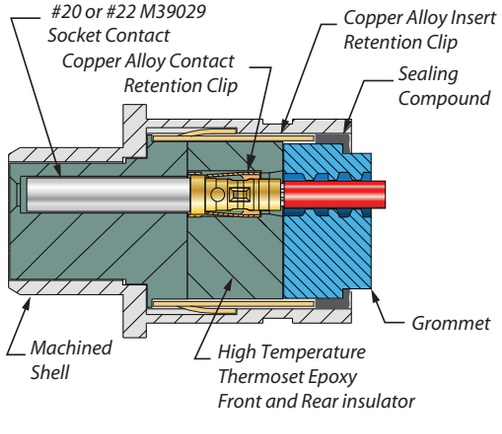
Space-grade M24308 intermateable

The HiPer-D connector is a M24308-type D-Subminiature connector with superior design features. Unlike standard M24308 connectors with stamped steel shells, the HiPer-D connector features such as a one-piece machined shell, 200°C continuous operating temperature rating and enhanced, mated shell EMI/RFI protection via an integrated ground spring. Aerospace grade fluorosilicone grommets and face seals (JAXA / NASA outgassing available) provide environmental protection. The HiPer-D is intermateable, intermountable and interchangeable with standard M24308 D-Sub connectors.

- **Advanced temperature, vibration and EMC/ electrical performance**
- **11 standard and 20 combo insert arrangements**
- **High temperature epoxy insulators**
- **Watertight sealing**
- **Rugged machined one-piece shell**

STANDARD AND HIGH DENSITY HIPER-D® - CUTAWAY



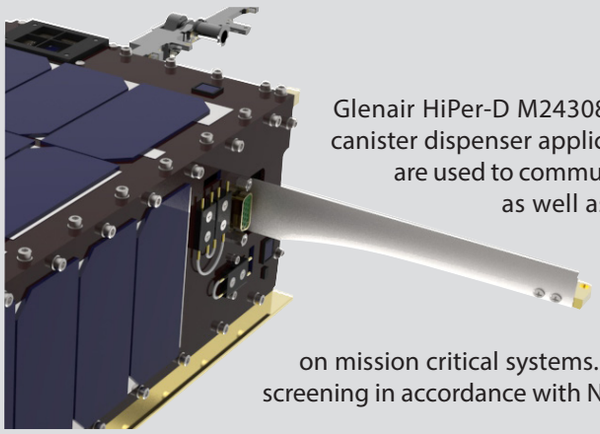


SERIES 28

HiPer-D Space Grade Connectors

Product Selection Guide

B



Glenair HiPer-D M24308 D-sub connectors are ideally suited for CubeSat or NanoSat canister dispenser applications where rack and panel or connectorized wire assemblies are used to communicate with HDRMs, pin pullers, pin pushers, door status sensors, as well as system communications and testing prior to deployment of satellite equipment. Standardized usage of M24308 connectors on hardware interfaces simplifies interconnection and communication. Glenair HiPer-D space grade M24308 D-sub connectors eliminate potential interconnect electrical problems on mission critical systems. Connectors are supplied with NASA/ESA/JAXA outgassing and screening in accordance with NASA EEE-INST-0002.

OTHER M24308 HIPER-D SOLUTIONS ALSO AVAILABLE - SEE OUR HIPER-D CATALOG

Sealed Panel Mount Technology

Combo HiPer-D Contact Arrangements

Ground Fingers for Improved EMC

Advanced Board Mount Features

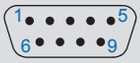
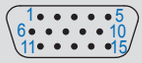
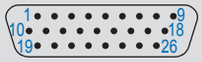
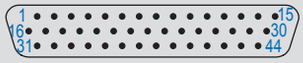
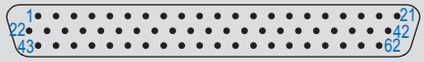
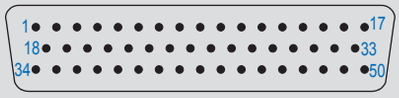
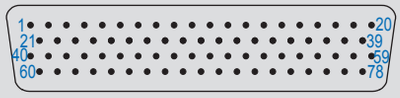
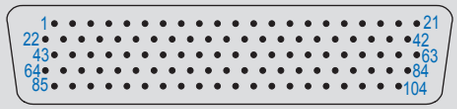
Modern EMI backshells

Dimensions in Inches (millimeters) are subject to change without notice.

HiPer-D Space Grade Connectors

Available shell sizes and contact arrangements

STANDARD AND HIGH DENSITY CONTACT ARRANGEMENTS *(face view of pin connector)*

	Standard Density	High Density
		
Arrangement	**1S9**	**1H15**
Shell Size	1	1
Contacts	9 #20	15 #22
		
Arrangement	**2s15**	**2H26**
Shell Size	2	2
Contacts	15 #20	26 #22
		
Arrangement	**3S25**	**3H44**
Shell Size	3	3
Contacts	25 #20	44 #22
		
Arrangement	**4S37**	**4H62**
Shell Size	4	4
Contacts	37 #20	62 #22
		
Arrangement	**5S50**	**5H78**
Shell Size	5	5
Contacts	50 #20	78 #22
		
Arrangement		**6H104**
Shell Size		6
Contacts		104 #22

HiPer-D Space Grade Connectors

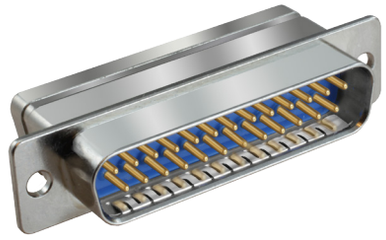
Reference and Technical Data

Description	Requirement	Procedure
Voltage Rating (DWV)	1000 VAC Sea Level	EIA-364-20
Operating Temperature	-65º C. to +200º C.	
Insulation Resistance	5000 megohms minimum	EIA-364-21
Current Rating	Size #20 7.5A, #22 5A	
Contact Resistance	**Wire Size** / **Test Current** / **Millivolt Drop** 20 / 7.5 / 55 22 / 5 / 73 24 / 3 / 45	EIA-364-06
Low Level Contact Resistance	**Wire Size** / **Max Milliohms** 20 / 9 22 / 15 24 / 20	EIA-364-23
Shell-to-Shell Resistance	2.5 milliohm max (ground spring required)	EIA-364-83
Shielding Effectiveness	**Freq. GHz** / **Min Attenuation (dB)** 0.1 / 100 0.4 / 90 0.8 / 85 1.0 / 80 3.0 / 55 6.0 / 40 10.0 / 30	EIA-364-66 Electroless nickel plated shells with ground spring installed
Water Immersion, mated	1 hour immersion at a depth of 1 meter	MIL-STD-810F Method 512.4
Ingress Protection Rating	IP67, mated connectors	IEC-60529
Vibration, Sine	20 g's	EIA-364-28
Vibration, Random	43 g's	EIA-364-28
Mechanical Shock	300 g's	EIA-364-27
Thermal Shock	-65º C. to +200º C.	EIA-364-32
Humidity	10 cycles, 10 days, 25ºC to 65ºC	EIA-364-31
Altitude Immersion	75,000 feet	EIA-364-03
Fluid Immersion	No damage from solvents, oils, and fuels	EIA-364-10
Magnetic Permeability	2 µ maximum	EIA-364-54
Mechanical Durability	500 Mating Cycles	EIA-364-09

Description	Material	Finish
Contacts	Copper Alloy	Gold (50 microin.) over nickel
Socket Contact Hood (Size 20, 22)	Stainless steel	Passivated
Shell	Aluminum Alloy or stainless steel	See ordering information
Insulators	Thermoset epoxy resin per ASTM D-5948	None
Interfacial Seal	Fluorosilicone	None
Grommet	Fluorosilicone	None
EMI Spring	Copper alloy	Electroless nickel
Contact retention clips	Copper alloy	None
Insert retention clip	Copper alloy	None
Sealant	RTV silicone	None
Hardware	Stainless steel (300 series)	Passivated
O-ring	Fluorosilicone	None

HiPer-D Space Grade Connectors

280-018P inline cable or panel mount pin connector, crimp termination

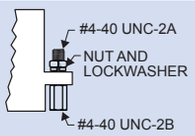
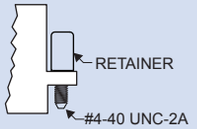
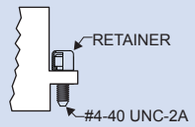
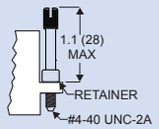
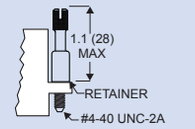


HiPer-D pin connectors for cable or panel mount feature crimp, rear-releaseable size #20 or #22 contacts. Intermateable with standard M24308-type D-Subminiature connectors, the HiPer-D features a rugged machined aluminum shell, waterproof sealing and optional ground springs for improved resistance to electromagnetic interference. Gold-plated size #20 contacts conform to M39029/64-369 and accept #20 to #24 AWG wire. Gold-plated size #22 contacts conform to M39029/58-360 and accept #22 to #28 AWG wire. Contacts are packaged with connector. Glass-reinforced thermoset epoxy insulators, copper alloy retention clips. Fluorosilicone face seal and rear grommet meet IP67 immersion requirement. 1000 VAC, 5 Amps (#22) or 7.5 Amps (#20).

B

How To Order					
Sample Part Number	**280-018P**	**3S25**	**ME**	**G**	**P**
Basic Part Number	**280-018P**				
Shell Size-Contact Arrangement	See Shell Size - Contact Arrangements Table				
Shell Finish	**ME** = Electroless Nickel (RoHS) **Z2** = Gold (RoHS) **Z1** = Passivated Stainless Steel (RoHS)				
Ground Spring	**G** = Supplied with EMI Ground Spring	**N** = No Ground Spring			
Mating Hardware	**N** = No Hardware (Through-Hole) **L** = Jackscrew, Hex Head, Low Profile **S** = Screwlock, Male, Hex Head, Low Profile	**P** = #4-40 Female Jackpost **K** = Jackscrew, Slot Head, Extended Length **T** = Screwlock, Male, Slot Head, Extended Length			

Shell Size - Contact Arrangements		
Shell Size-Contact Arr.	**Contact Size and Qty**	
	#20	**#22**
Standard Density		
1S9	9	
2S15	15	
3S25	25	
4S37	37	
5S50	50	
High Density		
1H15		15
2H26		26
3H44		44
4H62		62
5H78		78
6H104		104

Mating Hardware	
N Thru-Hole No Hardware	**P** Female Jackpost
	
S Captive Screwlock, Hex Head	**L** Captive Jackscrew, Hex Head
	
K Slot-Head Extended Jackscrew	**T** Slot-Head Extended Captive Screwlock
	

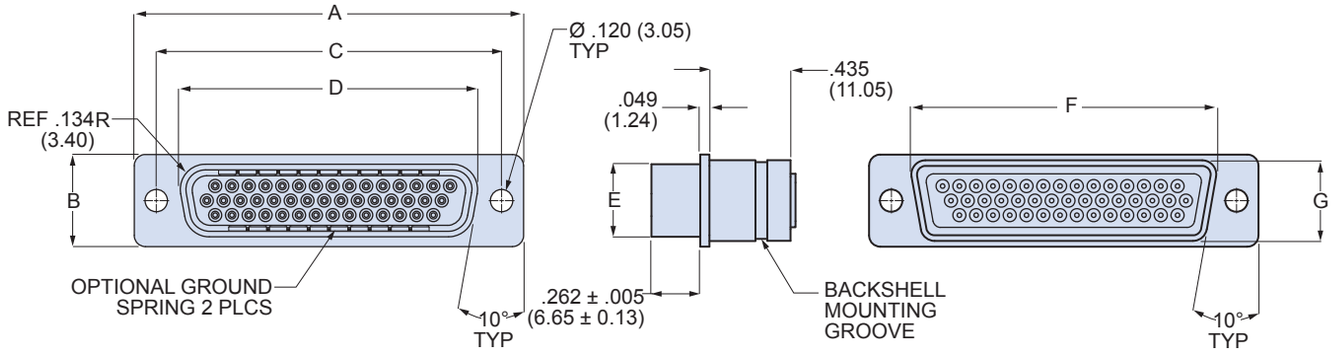
Materials and Finishes	
Shell	Aluminum alloy
Contacts	Copper alloy, 50 microin. gold plated
Insulators	Thermoset epoxy
Retention Clips	Copper alloy
Grommet and Seal	Fluorosilicone rubber
EMI Spring	Copper alloy, nickel plated
Hardware	300 series stainless steel

Specifications	
Current Rating	#22 5 AMPS, #20 7.5 AMPS
Test Voltage	1000 VAC RMS
Insulation Resistance	5000 megohms minimum
Operating Temperature	-65° C. to +200° C.
Ingress Protection	IP 67
Shock	300 g.
Vibration, Random	43.92 g.

HiPer-D Space Grade Connectors

280-018P inline cable or panel mount pin connector, crimp termination

280-018P DIMENSIONS



Dimensions														
	A		B		C Basic		D		E		F Max.		G Max.	
Shell Size	in ± .015	mm ± 0.38	in ± .015	mm ± 0.38	in.	mm	in ± .005	mm ± 0.13	in ± .005	mm ± 0.13	in.	mm	in.	mm
1	1.213	30.81	.494	12.55	.984	24.99	.726	18.44	.389	9.88	.769	19.53	.432	10.97
2	1.541	39.14	.494	12.55	1.312	33.32	1.054	26.77	.389	9.88	1.093	27.76	.432	10.97
3	2.088	53.04	.494	12.55	1.852	47.04	1.594	40.49	.389	9.88	1.635	41.53	.432	10.97
4	2.729	69.32	.494	12.55	2.500	63.50	2.242	56.95	.389	9.88	2.282	57.96	.432	10.97
5	2.635	66.93	.605	15.37	2.406	61.11	2.139	54.33	.501	12.73	2.188	55.58	.544	13.82
6	2.729	69.32	.668	16.97	2.500	63.50	2.272	57.71	.563	14.30	2.312	58.72	.606	15.39

NOTES

1. HiPer-D connectors are available with a wide variety of materials and finishes. See ***About Series 28 HiPer-D® Shell Plating Options*** for additional choices . Glenair offers the industry's widest selection of plating and material choices with no setup charge, no minimum order quantity and no schedule impact.
2. For panel cutout dimensions, refer to ***Panel Cutouts and Printed Circuit Board Footprints***.
3. Connectors are supplied with crimp contacts per M39029. Contacts are not installed. Refer to ***HiPer-D® Contacts and Crimp Tools*** for contact part numbers, specifications, crimp tool information, and insertion/extraction tools.
4. HiPer-D connectors meet the requirements of MIL-DTL-24308 and are intermateable with standard M24308-type D-Subminiature connectors with corresponding contact arrangements and type.
5. Additional electrical, mechanical and environmental specifications are listed in ***HiPer-D® Product Specification***.

HiPer-D Space Grade Connectors

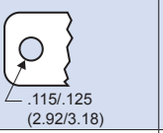
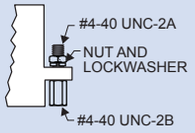
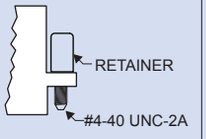
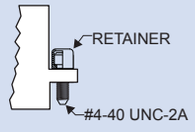
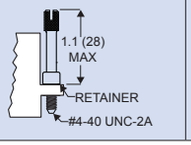
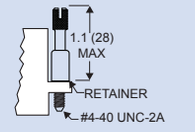
280-019S inline cable or panel mount socket connector,crimp termination

HiPer-D socket connectors for in-line cable or panel mount feature crimp, rear-releaseable size #20 or #22 contacts. Intermateable with standard M24308-type D-Subminiature connectors, the HiPer-D features a rugged machined aluminum shell and waterproof sealing. Gold-plated size #20 contacts conform to M39029/63-368 and accept #20 to #24 AWG wire. Gold-plated size #22 contacts conform to M39029/57-354 and accept #22 to #28 AWG wire. Contacts are packaged with connector. Glass-reinforced thermoset epoxy insulators, copper alloy retention clips. Fluorosilicone rear grommet meets IP67 immersion requirement. Shell has backshell attachment groove. 1000 VAC, 5 Amps (#22) or 7.5 Amps (#20).

B

How To Order				
Sample Part Number	**280-019S**	**4H62**	**ME**	**L**
Basic Part Number	**280-019S**			
Shell Size-Contact Arrangement	See Shell Size - Contact Arrangements Table			
Shell Finish	**ME** = Electroless Nickel (RoHS) **Z2** = Gold (RoHS) **Z1** = Passivated Stainless Steel (RoHS)			
Mating Hardware	**N** = No Hardware (Through-Hole) **L** = Jackscrew, Hex Head, Low Profile **S** = Screwlock, Male, Hex Head, Low Profile		**P** = #4-40 Female Jackpost **K** = Jackscrew, Slot Head, Extended Length **T** = Screwlock, Male, Slot Head, Extended Length	

Shell Size - Contact Arrangements		
Shell Size-Contact Arr.	**Contact Size and Qty**	
	#20	**#22**
Standard Density		
1S9	9	
2S15	15	
3S25	25	
4S37	37	
5S50	50	
High Density		
1H15		15
2H26		26
3H44		44
4H62		62
5H78		78
6H104		104

Mating Hardware	
N Thru-Hole No Hardware	**P** Female Jackpost
	
S Captive Screwlock, Hex Head	**L** Captive Jackscrew, Hex Head
	
K Slot-Head Extended Jackscrew	**T** Slot-Head Extended Captive Screwlock
	

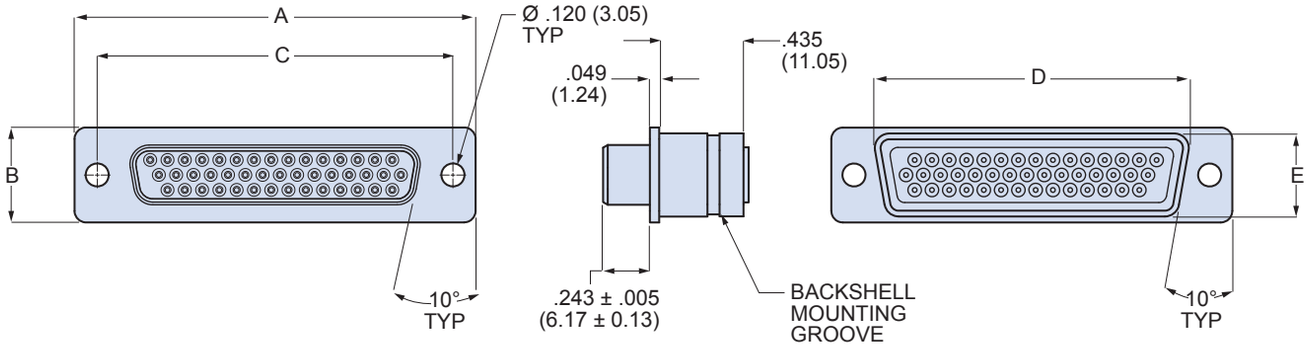
Materials and Finishes	
Shell	Aluminum alloy
Contacts	Copper alloy, 50 microin. gold plated
Insulators	Thermoset epoxy
Retention Clips	Copper alloy
Grommet	Fluorosilicone rubber
Hardware	300 series stainless steel

Specifications	
Current Rating	#22 5 AMPS, #20 7.5 AMPS
Test Voltage	1000 VAC RMS
Insulation Resistance	5000 megohms minimum
Operating Temperature	-65° C. to +200° C.
Ingress Protection	IP 67
Shock	300 g.
Vibration, Random	43.92 g.

HiPer-D Space Grade Connectors

280-019S inline cable or panel mount socket connector, crimp termination

280-019S DIMENSIONS



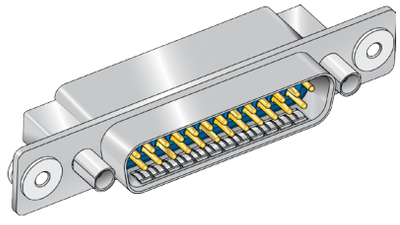
Dimensions										
	A		B		C Basic		D		E	
Shell Size	in ± .015	mm ± 0.38	in ± .015	mm ± 0.38	in.	mm	in ± .005	mm ± 0.13	in ± .005	mm ± 0.13
1	1.213	30.81	.494	12.55	.984	24.99	.769	19.53	.432	10.97
2	1.541	39.14	.494	12.55	1.312	33.32	1.093	27.76	.432	10.97
3	2.088	53.04	.494	12.55	1.852	47.04	1.635	41.53	.432	10.97
4	2.729	69.32	.494	12.55	2.500	63.50	2.282	57.96	.432	10.97
5	2.635	66.93	.605	15.37	2.406	61.11	2.188	55.58	.544	13.82
6	2.729	69.32	.668	16.97	2.500	63.50	2.312	58.72	.606	15.39

NOTES

1. HiPer-D connectors are available with a wide variety of materials and finishes. See ***About Series 28 HiPer-D® Shell Plating Options*** for additional choices . Glenair offers the industry's widest selection of plating and material choices with no setup charge, no minimum order quantity and no schedule impact.
2. For panel cutout dimensions, refer to ***Panel Cutouts and Printed Circuit Board Footprints***.
3. Connectors are supplied with crimp contacts per M39029. Contacts are not installed. Refer to ***HiPer-D® Contacts and Crimp Tools*** for contact part numbers, specifications, crimp tool information, and insertion/extraction tools.
4. HiPer-D connectors meet the requirements of MIL-DTL-24308 and are intermateable with standard M24308-type D-Subminiature connectors with corresponding contact arrangements and type.
5. Additional electrical, mechanical and environmental specifications are listed in ***HiPer-D® Product Specification***.

HiPer-D Space Grade Connectors

280-030P float mount pin connector for blind mating with float bushings or guide pins, crimp termination

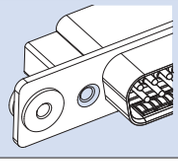
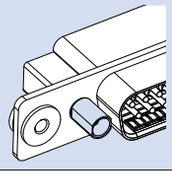
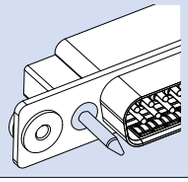


280-030P HiPer-D pin connectors feature stainless steel float bushings for blind mating. Attach to panel with #4-40 screws (not supplied with connector). Crimp, rear-releaseable size #20 or #22 contacts. Intermateable with standard M24308-type D-Subminiature connectors, the HiPer-D features a rugged machined aluminum shell, rubber seals and optional ground springs for improved resistance to electromagnetic interference. Threaded holes on the rear of the connector allow direct attachment of HiPer-D EMI backshells. Contacts are packaged with connector. Terminate contacts with crimp tools purchased separately. Glass-reinforced thermoset epoxy insulators, copper alloy retention clips. Fluorosilicone face seal and rear grommet meet IP67 immersion requirement (mated). 1000 VAC, 5 Amps (#22) or 7.5 Amps (#20).

B

How To Order					
Sample Part Number	**280-030P**	**6H104**	**MT**	**N**	**N**
Basic Part Number	**280-030P**				
Shell Size-Contact Arrangement	See Shell Size - Contact Arrangements Table				
Shell Finish	**ME** = Electroless Nickel (RoHS) **Z2** = Gold (RoHS) **Z1** = Passivated Stainless Steel (RoHS)				
Ground Spring	**G** = Supplied with EMI Ground Spring	**N** = No Ground Spring			
Mating Hardware	**N** = No Hardware (supplied with #8-32 tapped hole) **B** = Female Guide Bushings	**G** = Male Guide Pins			

Shell Size - Contact Arrangements		
Shell Size-Contact Arr.	**Contact Size and Qty**	
	#20	**#22**
Standard Density		
1S9	9	
2S15	15	
3S25	25	
4S37	37	
5S50	50	
High Density		
1H15		15
2H26		26
3H44		44
4H62		62
5H78		78
6H104		104

Mating Hardware
N No Hardware #8-32 tapped hole

B Female Guide Bushings

G Male Guide Pins


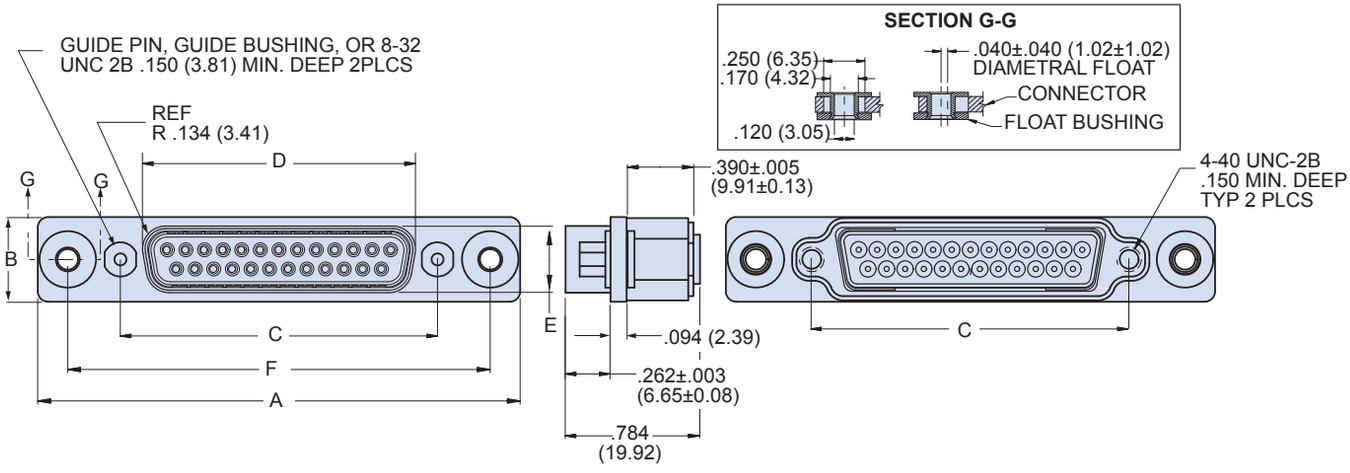
Materials and Finishes	
Shell	Aluminum alloy
Contacts	Copper alloy, 50 microin. gold plated
Insulators	Thermoset epoxy
Retention Clips	Copper alloy
Grommet, Seal, O-ring	Fluorosilicone rubber
Hardware	300 series stainless steel

Specifications	
Current Rating	#22 5 AMPS, #20 7.5 AMPS
Test Voltage	1000 VAC RMS
Insulation Resistance	5000 megohms minimum
Operating Temperature	-65° C. to +200° C.
Ingress Protection	IP 67
Shock	300 g.
Vibration, Random	43.92 g.

HiPer-D Space Grade Connectors

280-030P float mount pin connector for blind mating with float bushings or guide pins, crimp termination

280-030P DIMENSIONS



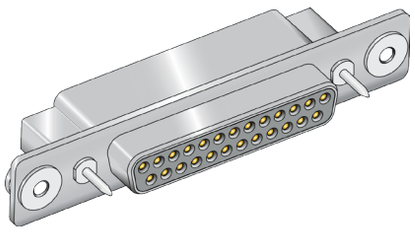
Dimnesions												
	A		B		C Basic		D		E		F Basic	
Shell Size	in ± .015	mm ± 0.38	in ± .015	mm ± 0.38	in.	mm	in ± .005	mm ± 0.13	in ± .005	mm ± 0.13	in	mm
1	1.986	50.44	.494	12.55	.984	24.99	.726	18.44	.389	9.88	1.636	41.55
2	2.314	58.78	.494	12.55	1.312	33.32	1.054	26.77	.389	9.88	1.964	49.89
3	2.854	72.49	.494	12.55	1.852	47.04	1.594	40.49	.389	9.88	2.504	63.60
4	3.502	88.95	.494	12.55	2.500	63.50	2.242	56.95	.389	9.88	3.152	80.06
5	3.408	86.56	.600	15.24	2.406	61.11	2.139	54.33	.501	12.73	3.058	77.67
6	3.502	88.95	.662	16.81	2.500	63.50	2.272	57.71	.563	14.30	3.152	80.06

NOTES

1. HiPer-D connectors are available with a wide variety of materials and finishes. See ***About Series 28 HiPer-D® Shell Plating Options*** for additional choices . Glenair offers the industry's widest selection of plating and material choices with no setup charge, no minimum order quantity and no schedule impact.
2. For panel cutout dimensions, refer to ***Panel Cutouts and Printed Circuit Board Footprints***.
3. Connectors are supplied with crimp contacts per M39029. Contacts are not installed. Refer to ***HiPer-D® Contacts and Crimp Tools*** for contact part numbers, specifications, crimp tool information, and insertion/extraction tools.
4. HiPer-D connectors meet the requirements of MIL-DTL-24308 and are intermateable with standard M24308-type D-Subminiature connectors with corresponding contact arrangements and type.
5. Additional electrical, mechanical and environmental specifications are listed in ***HiPer-D® Product Specification***.

HiPer-D Space Grade Connectors

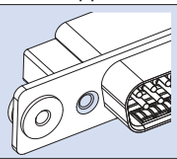
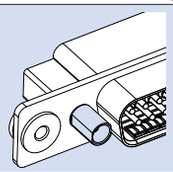
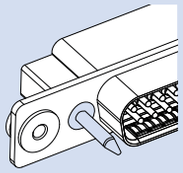
280-031S float mount socket connectors for blind mating with float mount bushings or guide pins, crimp termination



280-031S HiPer-D socket connectors feature stainless steel floating bushings for blind mate applications. Attach to panel with #4-40 screws (not supplied with connector). Crimp, rear-releaseable size #20 or #22 contacts. Intermateable with standard M24308-type D-Subminiature connectors, the HiPer-D features a rugged machined aluminum shell and rubber grommet. Threaded holes on the rear of the connector allow attachment of HiPer-D EMI backshells. Contacts are packaged with connector. Terminate contacts with crimp tools purchased separately. Glass-reinforced thermoset epoxy insulators, copper alloy retention clips. Connector meets IP67 immersion requirement. 1000 VAC, 5 Amps (#22) or 7.5 Amps (#20).

How To Order				
Sample Part Number	**280-031S**	**2H26**	**Z2**	**G**
Basic Part Number	**280-031S**			
Shell Size-Contact Arrangement	See Shell Size - Contact Arrangements Table			
Shell Finish	**ME** = Electroless Nickel (RoHS) **Z2** = Gold (RoHS) **Z1** = Passivated Stainless Steel (RoHS)			
Mating Hardware	**N** = No Hardware (supplied with #8-32 tapped holes) **G** = Male Guide Pins **B** = Female Guide Bushings			

Shell Size - Contact Arrangements		
Shell Size-Contact Arr.	**Contact Size and Qty**	
	#20	**#22**
Standard Density		
1S9	9	
2S15	15	
3S25	25	
4S37	37	
5S50	50	
High Density		
1H15		15
2H26		26
3H44		44
4H62		62
5H78		78
6H104		104

Mating Hardware
N No Hardware #8-32 tapped hole

B Female Guide Bushings

G Male Guide Pins


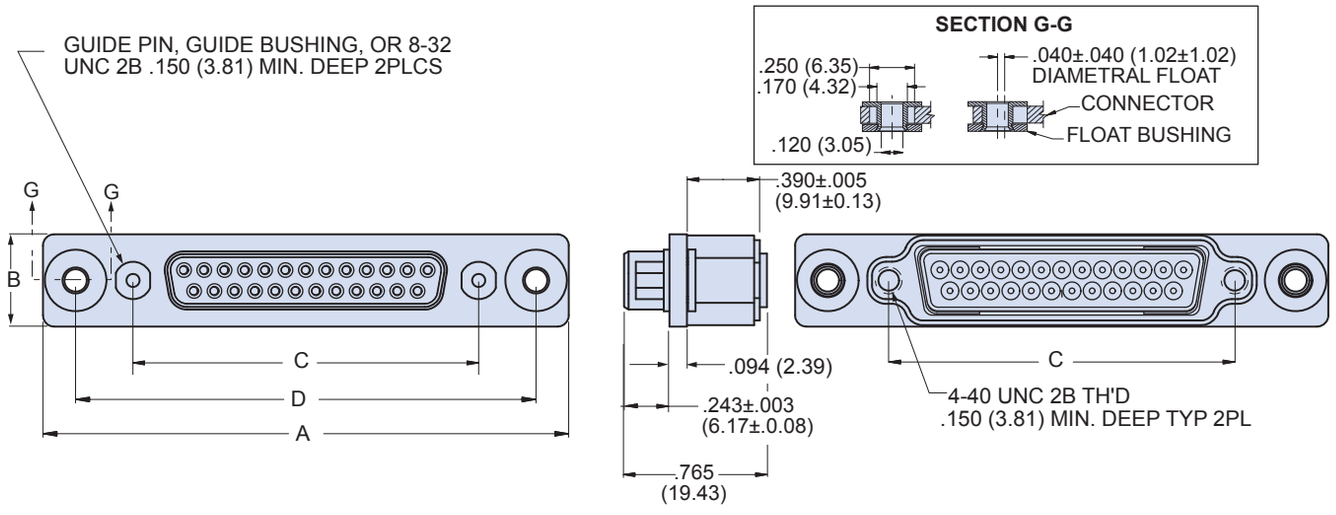
Materials and Finishes	
Shell	Aluminum alloy
Contacts	Copper alloy, 50 microin. gold plated
Insulators	Thermoset epoxy
Retention Clips	Copper alloy
Grommet	Fluorosilicone rubber
Hardware	300 series stainless steel

Specifications	
Current Rating	#22 5 AMPS, #20 7.5 AMPS
Test Voltage	1000 VAC RMS
Insulation Resistance	5000 megohms minimum
Operating Temperature	-65° C. to +200° C.
Ingress Protection	IP 67
Shock	300 g.
Vibration, Random	43.92 g.

HiPer-D Space Grade Connectors

280-031S float mount socket connectors for blind mating with float mount bushings or guide pins, crimp termination

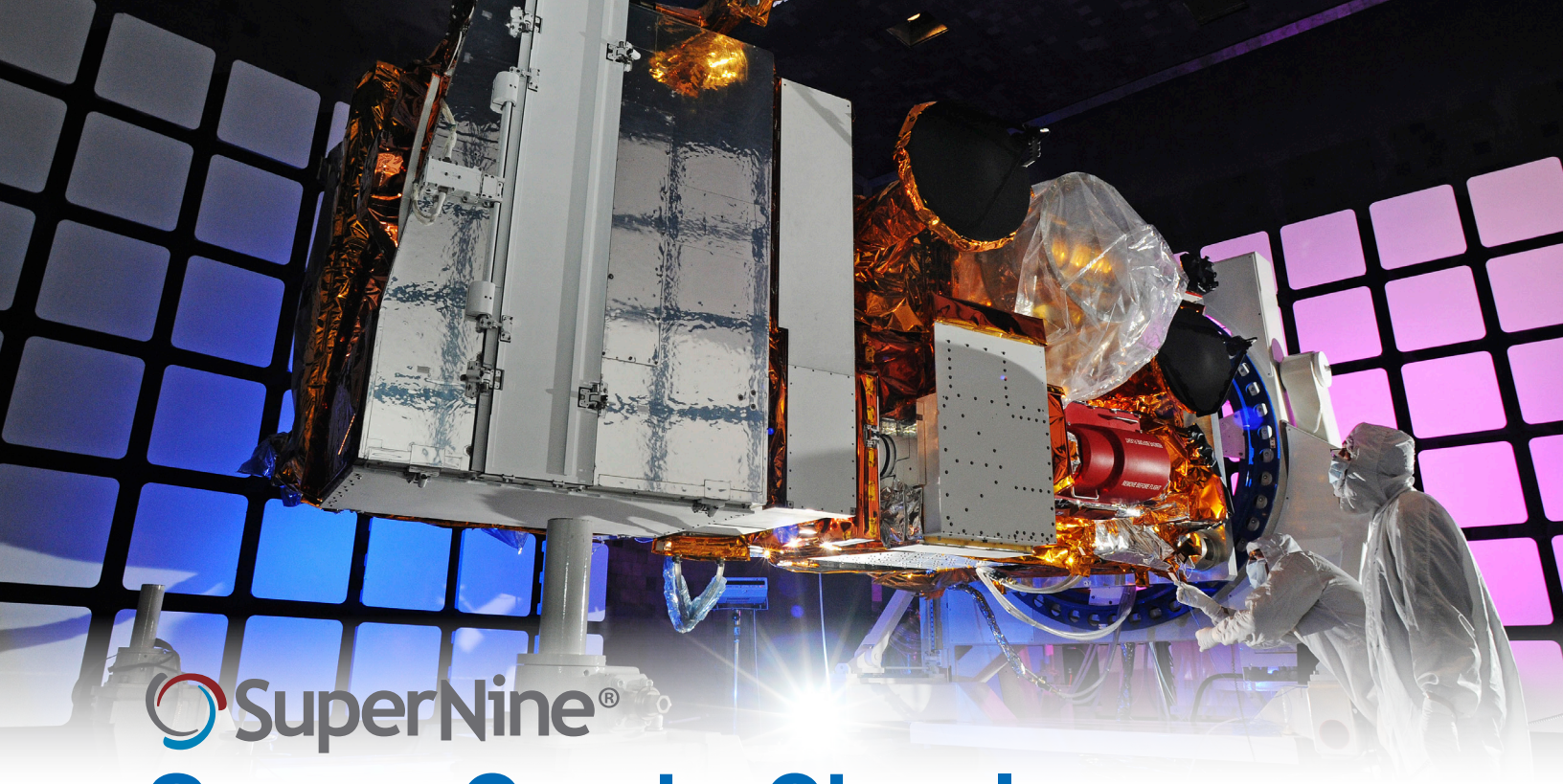
280-031S DIMENSIONS



Dimnesions								
Shell Size	A		B		C Basic		D Basic	
	in ± .015	mm ± 0.38	in ± .015	mm ± 0.38	in.	mm	in	mm
1	1.986	50.44	.494	12.55	.984	24.99	1.636	41.55
2	2.314	58.78	.494	12.55	1.312	33.32	1.964	49.89
3	2.854	72.49	.494	12.55	1.852	47.04	2.504	63.60
4	3.502	88.95	.494	12.55	2.500	63.50	3.152	80.06
5	3.408	86.56	.600	15.24	2.406	61.11	3.058	77.67
6	3.502	88.95	.662	16.81	2.500	63.50	3.152	80.06

NOTES

1. HiPer-D connectors are available with a wide variety of materials and finishes. See ***About Series 28 HiPer-D® Shell Plating Options*** for additional choices . Glenair offers the industry's widest selection of plating and material choices with no setup charge, no minimum order quantity and no schedule impact.
2. For panel cutout dimensions, refer to ***Panel Cutouts and Printed Circuit Board Footprints***.
3. Connectors are supplied with crimp contacts per M39029. Contacts are not installed. Refer to ***HiPer-D® Contacts and Crimp Tools*** for contact part numbers, specifications, crimp tool information, and insertion/extraction tools.
4. HiPer-D connectors meet the requirements of MIL-DTL-24308 and are intermateable with standard M24308-type D-Subminiature connectors with corresponding contact arrangements and type.
5. Additional electrical, mechanical and environmental specifications are listed in ***HiPer-D® Product Specification***.



SuperNine®

Space-Grade Circular Blind-Mate Connectors

Application: Glenair Series 253 blind-mate connectors are designed to meet applicable environmental, electrical and mechanical performance characteristics of D38999 Series III. The technology is well suited for use in commercial rack-and-panel instrumentation applications, as well as a blind-mate solution for satellite deployment, scientific research and development payloads, interstage, UAV, and munitions release and more.

- **Blind-mate, fixed and float-mount interconnects for non-ITAR commercial as well as military/defense applications**
- **Adjustable separation force (AKA assisted-release, zero extraction force) solutions**
- **Misalignment accommodation and special auxiliary sealing for trouble-free blind mating in environmental applications**
- **Available in most symmetrical MIL-STD-1560 insert arrangements with contacts sizes from #23 to #8**
- **Selected materials offer low outgassing properties and high resistance to both corrosion and stress corrosion cracking**
- **NASA outgassing bake-out process available**
- **Designed to withstand the rigors of launch and flight—including shock, vibration, thermal vacuum, acceleration, and temperature extremes**
- **Standard accessory threads and teeth per MIL-DTL-38999 accommodate a wide range of backshell accessories**
- **Crimp-removable contacts standard. Consult factory for PC tails, dual-flange standoffs, custom blind-mate configurations, and hermetically sealed options**

Current Rating	
Size Contact	Amps
23	5
22D	5
20	7.5
16	13
12	23

Unmated Test Voltages, AC RMS, 60 Hz				
Altitude (Feet)	Service Rating M	Service Rating N	Service Rating I	Service Rating II
Sea Level	1300	1000	1800	2300
50,000	550	400	600	800
70,000	350	260	400	500
100,000	200	260	200	200

Dimensions in Inches (millimeters) are subject to change without notice.

Space-grade, blind-mate connectors
Float-mount and adjustable separation force connectors
MIL-DTL-38999 Series III type, environmental, crimp contact

CRITICAL MECHANICAL FEATURES OF BLIND-MATE AND ADJUSTABLE SEPARATION FORCE (ZEF) CONNECTORS

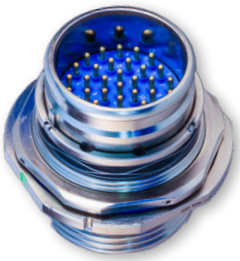
Roll-off nose: allows for the smooth disconnection of blind mate plugs and receptacles. Without this feature, connectors can catch or hang during mate and demate.

Float mounting: allows for a modicum of coplanar movement of the receptacle during rack-and-panel and other blind mate applications, preventing both contact and shell damage.

Misalignment accommodation: Additional radial, axial, and angular misalignment during mating is accounted for in the receptacle design with integral wave springs.

Sealing: Misalignment accommodation makes environmental sealing difficult in blind-mate connectors. The problem is solved with auxiliary external seals.

EMI shielding: Glenair incorporates ground springs in receptacle connectors as well as grounding fingers in special coupling nut-equipped plugs (253-018-G6 feed-thru shown) to optimize 360° shell-to-shell continuity.



Assisted separation force: Glenair supplies two styles of spring-loaded blind-mate connectors. **Adjustable kick-off styles** feature spring-loaded posts on the plug and an adjustment ring on the receptacle used to calibrate separation force. A second style uses wave springs on the shell body.

Available non-ITAR environmental blind-mate and adjustable separation force solutions		
Basic Part No.	**Description**	**Mates With**
253-014	Fixed jam-nut mount plug with roll-on/roll-off nose and Accessory threads	253-015
253-015	Floating jam-nut mount receptacle with misalignment accommodation and optional sealing	253-014
253-016	Fixed wall mount plug with spring assist (zero separation force)	253-017
253-017	Floating wall mount receptacle with adjustable separation force and misalignment accommodation	253-016
253-018-07	Blind-mate feed-thru, jam-nut mount plug with B-side D38999 type receptacle mating interface and assisted kick-off (spring force)	253-019
253-018-G6	Blind-mate in-line feed-thru with B-side D38999 type plug mating interface and assisted kick-off (spring force)	253-019
253-019	Floating jam-nut mount receptacle with misalignment accommodation and optional sealing	253-018
253-031	Blind-mate jam-nut mount plug with kick-off spring and accessory threads	253-032
253-032	Floating jam-nut mount receptacle with misalignment accommodation	253-031
253-033	Float mount feed-thru, jam nut mount receptacle to 38999 type Series III plug mating interface	253-019
253-025	Locking circuit and test mate connector	253-016

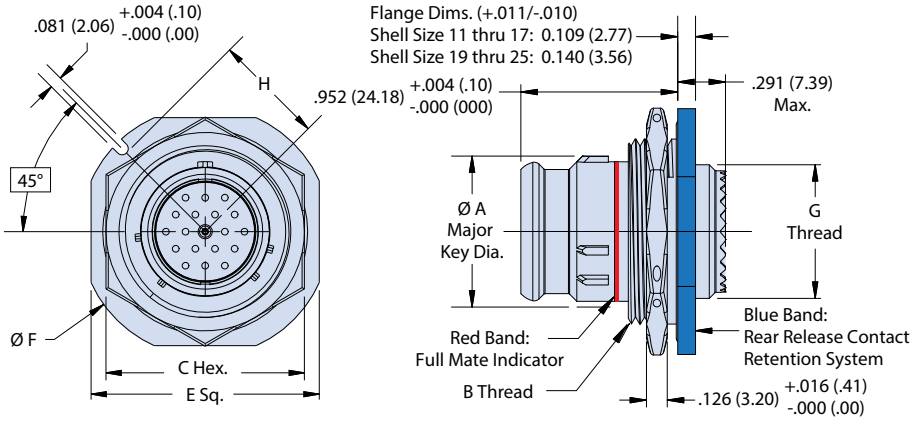
Space-grade, blind-mate connectors
Plug and receptacle pair, jam-nut mount
with misalignment accommodation and optional sealing

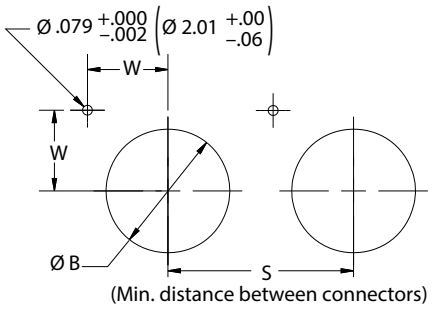
SuperNine®

Part Number Development								
Sample Part Number	**253-014**	**-07**	**ME**	**25-35**	**P**	**N**	**NS**	**H**
Series / Basic Part No.	**253** = Blind-mate **-014** = Plug (fixed mount) **-015** = Receptacle (float mount)							
Connector Style	**07** = Jam nut mount; contact factory for wall mount receptacles							
Material/Finish	**ME** = Aluminum, electroless nickel **ZL** = CRES, electrodeposited nickel **MT** = Aluminum, nickel PTFE **Z1** = CRES, passivated							
Shell Size - Insert Arrangement*	Per MIL-STD-1560; symmetrical layouts only, consult factory for complete details							
Contact Type	**P** = Pin, crimp removable **S** = Socket, crimp removable **A** = Pin insert, less contacts **B** = Socket insert, less contacts							
Alternate Polarization	**A, B, C, D, E, N** = Normal (Polarization for intermateability with 253-014 is per MIL-DTL-38999 Series I)							
Non Sealing	**NS** = Non-Sealing (omit for external elastomer seal version, applies to 253-015 only)							
Jam-Nut Type	**H** = Hex **S** = Spanner with wire holes (applies to 015 only)							

***Refer to section A for complete details.** Refer to Space-Grade Guidelines material (IAW NASA EEE INST-002) for outgassing and screening modification codes, on pages 60 and 61. Modification codes may be added directly to the end of any valid part number

253-014 FIXED JAM-NUT MOUNT PLUG WITH ROLL-ON/ROLL-OFF NOSE AND ACCESSORY THREADS





253-014 Dimensions							
Shell Size	A Max Dia.	Thread B Class 2A	C Max	E (±.016)	F Max Dia.	G Thread Class 2A	H (+0/-.008)
11	.673 (17.09)	.8125-20 UNEF	1.016 (25.81)	1.250 (31.75)	1.386 (35.20)	.5625-24	.604 (15.34)
13	.798 (20.27)	1.0000-20 UNEF	1.181 (30.00)	1.375 (34.92)	1.511 (38.38)	.6875-24	.666 (16.92)
15	.923 (23.44)	1.1250-18 UNEF	1.300 (33.02)	1.500 (38.10)	1.636 (41.55)	.8125-20	.729 (18.52)
17	1.048 (26.62)	1.2500-18 UNEF	1.457 (37.01)	1.625 (41.28)	1.761 (44.73)	.9375-20	.791 (20.09)
19	1.173 (29.79)	1.3750-18 UNEF	1.575 (40.00)	1.812 (46.02)	1.949 (49.50)	1.0625-18	.893 (22.68)
21	1.298 (32.97)	1.5000-18 UNEF	1.693 (43.00)	1.938 (49.23)	2.073 (52.65)	1.1875-18	.955 (24.26)
23	1.423 (36.14)	1.6250-18 UNEF	1.880 (47.75)	2.062 (52.37)	2.200 (55.88)	1.3125-18	1.017 (25.83)
25	1.548 (39.32)	1.7500-18 UNS	2.016 (51.21)	2.187 (55.55)	2.323 (59.00)	1.4375-18	1.096 (27.84)

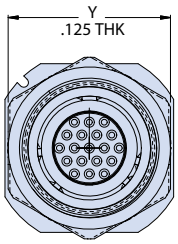
253-014 Recommended Panel Cutout Dimensions			
Shell Size	W	Diameter B ±.004	S
11	.460 (11.68)	0.821 (20.85)	1.282 (32.56)
13	.504 (12.80)	1.007 (25.58)	1.417 (35.99)
15	.549 (13.94)	1.134 (28.80)	1.559 (39.60)
17	.593 (15.06)	1.259 (31.98)	1.705 (43.31)
19	.665 (16.89)	1.384 (35.15)	1.850 (46.99)
21	.709 (18.01)	1.507 (38.28)	1.992 (50.60)
23	.753 (19.13)	1.634 (41.50)	2.134 (54.20)
25	.797 (20.24)	1.759 (44.68)	2.350 (59.69)

NOTES:

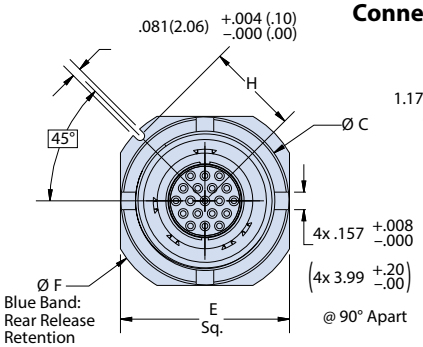
1. Glenair 253-014 is designed to mate with 253-015 with same insert arrangement.
2. Stainless steel locating pin to be shipped with connector
3. Misalignment capabilities are possible with 253-014, when mated to 253-015.
4. Contact manufacturer for outgassing options.
5. Material/finish
   - Shell, jam-nut: see P/N development, finish
   - Insulator: high grade rigid dielectric/N.A.
   - Seals: fluorosilicone blend/N.A.
   - contacts: copper alloy/gold plated

Space-grade blind-mate connectors
Plug and receptacle pair, jam-nut mount
with misalignment accommodation and optional sealing

253-015 FLOATING JAM-NUT MOUNT RECEPTACLE WITH MISALIGNMENT ACCOMMODATION AND OPTIONAL SEALING

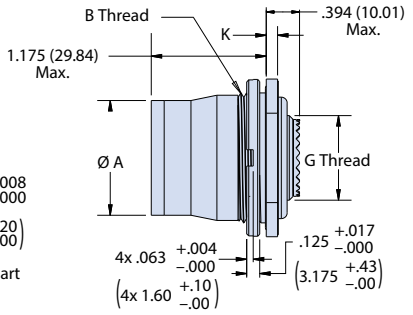


Hex Jam-nut



Spanner Jam-nut

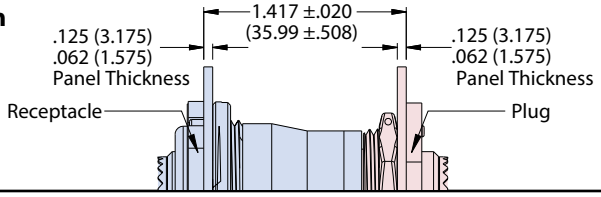
Connector Shown Includes Sealing Option

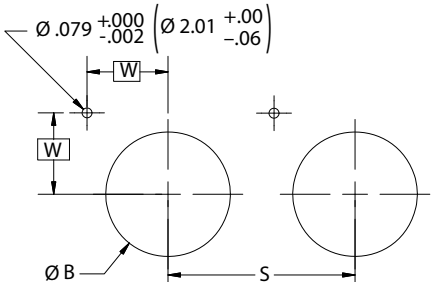


253-015 Dimensions									
Shell Size	A Max Dia.	Thread B Class 2A	C Max.	Y Hex	E ±.016(.41)	F Max Dia.	G Thd Class 2A	K +.011/.010 (+.28/.25)	H +0/-.008 (+0/-.20)
11	.853 (21.67)	1.0000-20 UNEF	1.264 (32.11)	1.181 (30.00)	1.266 (32.16)	1.500 (38.10)	.5625-24	.109 (2.77)	.666 (16.92)
13	.978 (24.84)	1.1250-18 UNEF	1.388 (35.26)	1.300 (33.02)	1.391 (35.33)	1.641 (41.68)	.6875-24	.109 (2.77)	.729 (18.52)
15	1.103 (28.02)	1.2500-18 UNEF	1.512 (38.40)	1.457 (37.01)	1.516 (38.51)	1.750 (44.45)	.8125-20	.109 (2.77)	.791 (20.09)
17	1.228 (31.19)	1.3750-18 UNEF	1.638 (41.61)	1.575 (40.00)	1.641 (41.68)	1.938 (49.23)	.9375-20	.109 (2.77)	.893 (22.68)
19	1.353 (34.37)	1.5000-18 UNEF	1.823 (46.30)	1.693 (43.00)	1.828 (46.43)	2.062 (52.37)	1.0625-18	.140 (3.56)	.955 (24.26)
21	1.478 (37.54)	1.6250-18 UNEF	1.953 (49.61)	1.880 (47.75)	1.954 (49.63)	2.188 (55.58)	1.1875-18	.140 (3.56)	1.017 (25.83)
23	1.603 (40.72)	1.7500-18 UNS	2.075 (52.71)	2.010 (51.05)	2.078 (52.78)	2.312 (58.72)	1.3125-18	.140 (3.56)	1.080 (27.43)
25	1.728 (43.89)	1.8750-16 UNS	2.122 (53.90)	2.125 (53.97)	2.128 (54.05)	2.327 (59.11)	1.4375-18	.140 (3.56)	1.086 (27.58)

Distance between mated flanges.

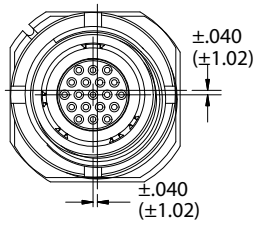
For reference only
(not deliverable)



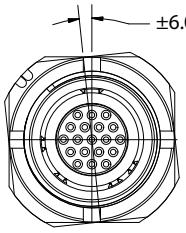


253-015 Misalignment Capabilities

Axial Misalignment

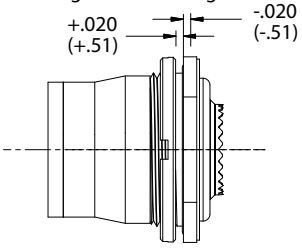


Angular Misalignment



Reference Only (Not Deliverable)

Longitudinal Misalignment



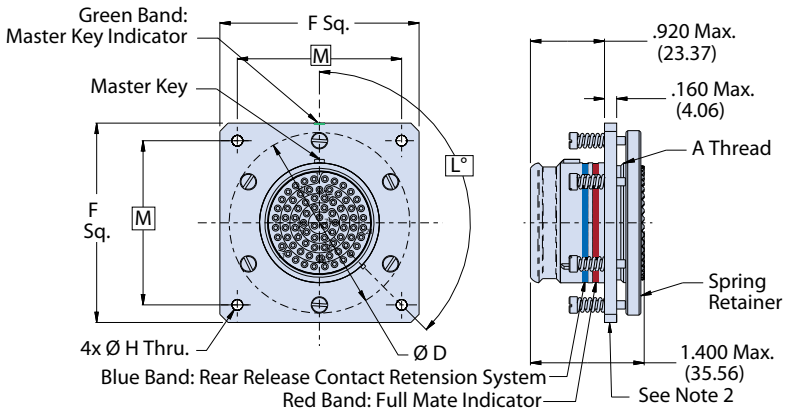
253-015 Recommended Panel Cutout Dimensions			
Shell Size	W	B Dia. ±.004 (.10)	S
11	.504 (12.80)	1.007 (25.58)	1.282 (32.56)
13	.549 (13.94)	1.134 (28.80)	1.417 (35.99)
15	.593 (15.06)	1.259 (31.98)	1.559 (39.60)
17	.665 (16.89)	1.384 (35.15)	1.705 (43.31)
19	.709 (18.01)	1.507 (38.28)	1.850 (46.99)
21	.753 (19.13)	1.634 (41.50)	1.992 (50.60)
23	.797 (20.24)	1.759 (44.68)	2.134 (54.20)
25	.842 (21.39)	1.884 (47.85)	2.262 (57.45)

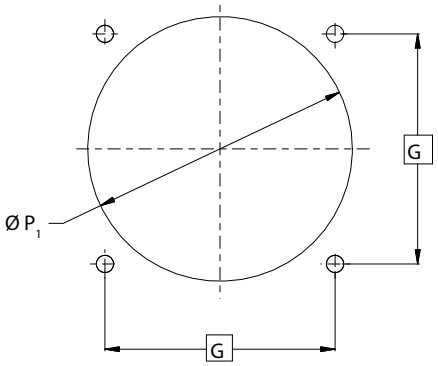
Space-grade, blind mate connectors
Wall mount assisted separation force (ZEF)
plug and receptacle pair with misalignment accommodation

Part Number Development								
Sample Part Number	**253-016**	**00**	**ME**	**21–35**	**S**	**N**	**MS**	**A**
Series / Basic Part No.	**253** = Blind-mate connector with adjustable assisted separation force **–016** = Plug (fixed mount) **–017** = Receptacle (float mount)							
Connector Style	**00** = Wall mount							
Material/Finish	**ME** = Aluminum, electroless nickel **ZL** = CRES, electrodeposited nickel **MT** = Aluminum, nickel PTFE **Z1** = CRES, passivated							
Shell Size-Insert Arrangement	Per MIL-STD-1560							
Contact Type	**P** = Pin, crimp removable **S** = Socket, crimp removable							
Alternate Polarization	**A** = 40°, **B** = 65°, **C** = 80°, **D** = 210°, **E** =250°, **F** = 280°, **G** = 310°, **H**= 330°, **N** = 135° (Normal) Per L°							
Contact Type	**MS** = Military specification							
Adjustment Ring Material	(253-017 receptacle only) **A** = Aluminum **C** = Corrosion-resistant steel							

***Refer to section A for complete details.** Refer to Space-Grade Guidelines material (IAW NASA EEE INST-002) for outgassing and screening modification codes, on pages 60 and 61. Modification codes may be added directly to the end of any valid part number

253-016 FIXED WALL MOUNT PLUG WITH SPRING ASSIST (ZERO SEPARATION FORCE)



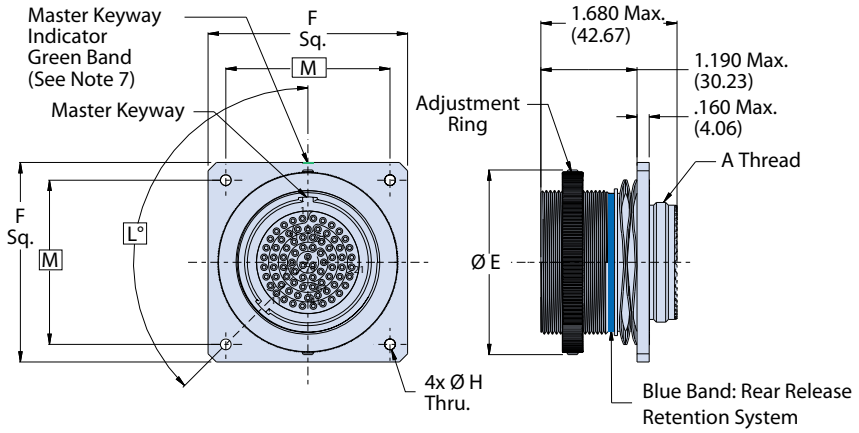


Recommended Panel Cut-out

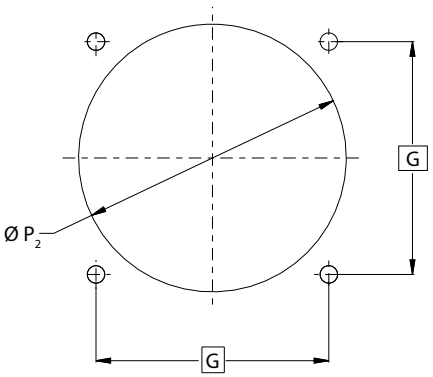
Dimensions for 253-016 and 253-017									
Shell Size	F Flange ±.010 (±.25)	M Square	Ø H ±.005 (±.13)	Ø D Max.	Ø E Max.	A Thread	Ø P_1 ±.005 (±.13)	Ø P_2 ±.005 (±.13)	G Square
9	1.430(36.32)	1.000(25.40)	.128(3.25)	1.250(31.75)	1.300 (33.02)	M12 X 1.0-6g-0.100R	1.300(33.02)	1.330 (33.78)	1.150 (29.21)
11	1.555(39.50)	1.200(30.48)	.128(3.25)	1.375(34.93)	1.425 (36.20)	M15 X 1.0-6g-0.100R	1.425(36.20)	1.455 (36.96)	1.200 (30.48)
13	1.680(42.67)	1.250(31.75)	.128(3.25)	1.500(38.10)	1.550 (39.37)	M18 X 1.0-6g-0.100R	1.550(39.37)	1.580 (40.13)	1.250 (31.75)
15	1.805(45.85)	1.375(34.93)	.128(3.25)	1.625(41.28)	1.675 (42.55)	M22 X 1.0-6g-0.100R	1.675(42.55)	1.705 (43.31)	1.375 (34.92)
17	1.930(49.02)	1.500(38.10)	.128(3.25)	1.750(44.45)	1.800 (45.72)	M25 X 1.0-6g-0.100R	1.800(45.72)	1.830 (46.48)	1.500 (38.10)
19	2.055(52.20)	1.625(41.28)	.128(3.25)	1.875(47.63)	1.925 (48.90)	M28 X 1.0-6g-0.100R	1.925(48.90)	1.955 (49.66)	1.625 (41.28)
21	2.180(55.37)	1.750(44.45)	.128(3.25)	2.000(50.80)	2.050 (52.07)	M31 X 1.0-6g-0.100R	2.050(52.07)	2.080 (52.83)	1.750 (44.45)
23	2.305(58.55)	1.875(47.63)	.154(3.91)	2.125(53.98)	2.175 (55.25)	M34 X 1.0-6g-0.100R	2.175(55.25)	2.205 (56.01)	1.875 (47.63)
25	2.430(61.72)	2.000(50.80)	.150(3.81)	2.250(57.15)	2.300 (58.42)	M37 X 1.0-6g-0.100R	2.300(58.42)	2.330 (59.18)	2.000 (50.80)

Space-grade, blind-mate connectors
Wall mount assisted separation force (ZEF)
plug and receptacle pair with misalignment accommodation

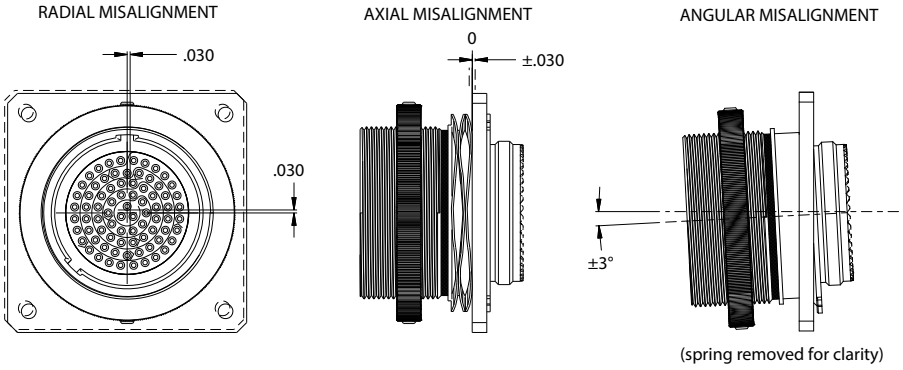
253-017 FLOATING WALL MOUNT RECEPTACLE WITH ADJUSTABLE SEPARATION FORCE AND MISALIGNMENT ACCOMMODATION



Recommended Panel Cut Out

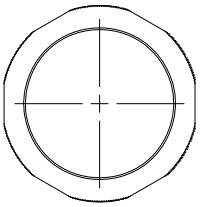


253-017 Misalignment Capabilities

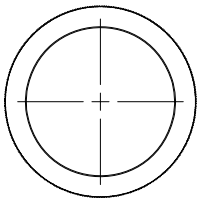


Adjustment Ring Geometry and Material Options

Contact manufacturer for other options



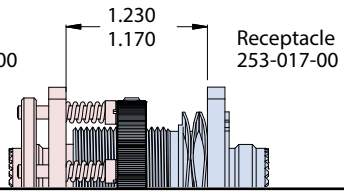
Cres (With Wrench Flats)



Al Alloy

Distance between mated flanges.

For reference only (not deliverable)



NOTES:

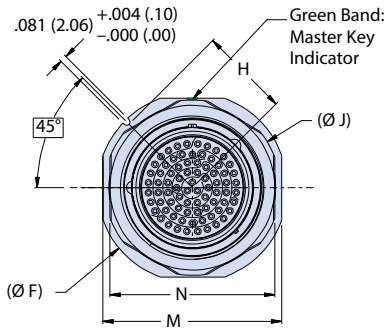
1. 253-017 mates with 253-016 fixed series.
2. Distance between mated mounting flanges: 1.170/1.230. Consult manufacturer other distance between mounting flanges is required
3. Separation force is adjustable ± 5 lbs when mated with 253-016 and 253-017 pairs have adjustable separation force of ±5 lbs
4. See Space-Grade guidelines material, in this section, for outgassing/screening options available
5. Spares: pin or socket contacts IAW AS39029 or per Glenair part number if controlled force contacts
6. Contact factory for PC tail versions
7. Material/finish
   - Shell (016 and 017), ring (017), retainer ring (016): see P/N development, finish
   - Wave spring(017), springs and spring retainer (016): CRES/ passivated
   - Insulators: high grade rigid dielectric/N.A.
   - Seals: fluorosilicone blend/N.A.

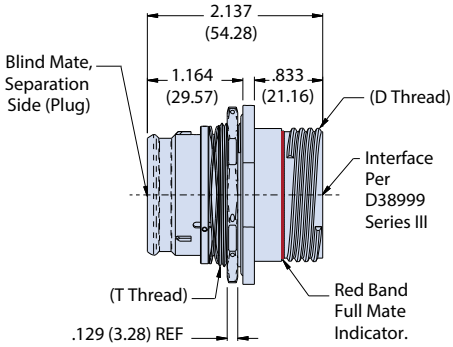
Space-grade, blind-mate connectors
Bulkhead feed-thrus with assisted kick-off
and standard triple-start plug and receptacle mating interfaces

Part Number Development						
Sample Part Number	**253-018**	**-07**	**ME**	**25-35**	**PP**	**N**
Series / Basic Part No.	**253-018** = Blind-mate feed-thru					
Connector Style	**-07** = Jam-nut mount, feed-thru plug (fixed) with rear D38999 type receptacle interface **-G6** = In-line plug with rear D38999 type plug interface and EMI spring					
Material/Finish	**ME** = Aluminum, electroless nickel **ZL** = CRES, electrodeposited nickel **MT** = Aluminum, nickel PTFE **Z1** = CRES, passivated					
Shell Size-Insert Arrangement*	Per MIL-STD-1560					
Contact Type	**PP** = Pin on both sides **BSDP** = Blind-mate side socket - D38999 side pin **SS** = Socket on both sides **BPDS** = Blind-mate side pin - D38999 side socket					
Alternate Polarization*	**A** = 40°, **B** = 65°, **C** = 80°, **D** = 210°, **E** =250°, **F** = 280°, **G** = 310°, **H**= 330°, **N** = 135° (Normal) Per L°. G6 only Refers to blind mate side. Plug/Receptacle side per MIL-DTL-38999					

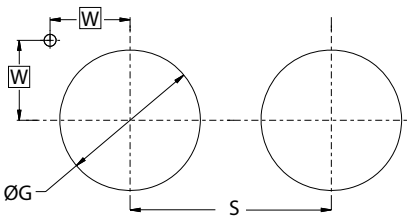
***Refer to section A for complete details.** Refer to Space-Grade Guidelines material (IAW NASA EEE INST-002) for outgassing and screening modification codes, on pages 60 and 61. Modification codes may be added directly to the end of any valid part number

253-018-07 BLIND-MATE FEED-THRU, JAM-NUT MOUNT PLUG WITH B-SIDE D38999 TYPE RECEPTACLE MATING INTERFACE AND ASSISTED KICK-OFF (SPRING FORCE)





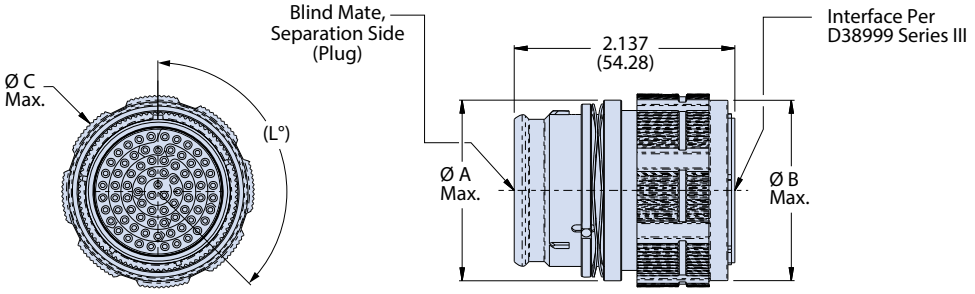
Dimensions							
Shell Size	**F Flange**	**H (End of Slot) [+0/-.008 (-.20)]**	**Ø J, Jam Nut**	**N, Jam Nut Flat**	**M, Flange Flats ±.010 (±.25)**	**T Thread Class 2A**	**D Thread 0.1P-0.3L-TS-2**
13	1.515 (38.48)	.666 (16.92)	1.375 (34.93)	1.175 (29.85)	1.430 (36.32)	1.000-20 UNEF	0.875 (22.23)
15	1.636 (41.55)	.729 (18.52)	1.500 (38.10)	1.300 (33.02)	1.500 (38.10)	1.125-18 UNEF	1.000 (25.40)
21	2.065 (52.45)	.955 (24.26)	1.875 (47.63)	1.688 (42.88)	1.930 (49.02)	1.500-18 UNEF	1.375 (34.92)
23	2.200 (55.88)	1.017 (25.83)	2.063 (52.40)	1.875 (47.63)	2.060 (52.32)	1.625-18 UNEF	1.500 (38.10)
25	2.316 (58.83)	1.096 (27.84)	2.141 (54.38)	2.010 (51.05)	2.180 (55.37)	1.750-18 UNS	1.625 (41.28)



Panel Cut-Out			
Shell Size	**Ø G, Thru Hole ±.004**	**W (Basic)**	**S**
13	1.009 (25.63)	.504 (12.80)	1.460 (37.08)
15	1.134 (28.80)	.549 (13.94)	1.545 (39.24)
21	1.509 (38.33)	.709 (18.01)	1.995 (50.67)
23	1.634 (41.50)	.753 (19.13)	2.120 (53.85)
25	1.759 (44.68)	.809 (20.55)	2.315 (58.80)

Space-grade, blind mate connectors
Feed-thru plug, jam-nut mount or in-line
IAW MIL-DTL-38999 Series III

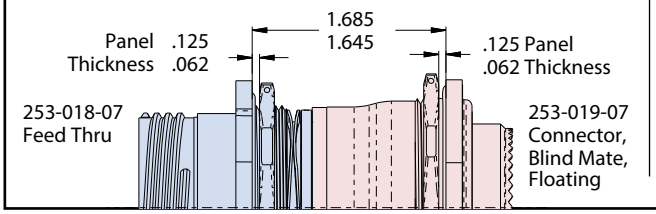
253-018-G6 BLIND-MATE IN-LINE PLUG WITH B-SIDE D38999 TYPE PLUG MATING INTERFACE AND ASSISTED KICK-OFF (SPRING FORCE)



Dimensions for 253-018-G6 Plug			
Shell Size	Ø A Max	Ø B Max.	Ø C Max
13	1.020 (25.91)	1.025 (26.03)	1.175 (29.85)
15	1.145 (29.08)	1.155 (29.34)	1.295 (32.89)
21	1.520 (38.61)	1.525 (38.73)	1.660 (42.16)
23	1.645 (41.78)	1.645 (41.78)	1.765 (44.83)
25	1.770 (44.96)	1.770 (44.96)	1.890 (48.01)

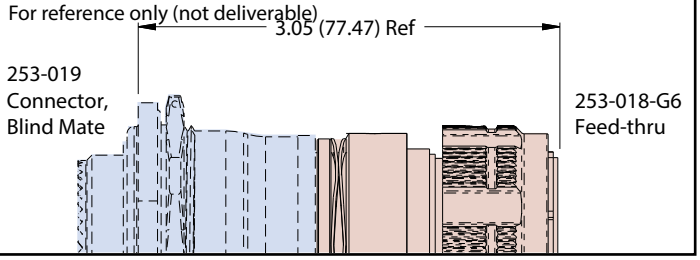
Distance between mated flanges.

For reference only (not deliverable)



Distance between mated connectors.

For reference only (not deliverable)



NOTES:

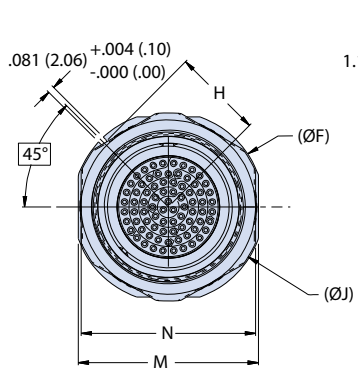
1. Mates with 253-019 and D38999 series III connectors with same insert arrangement and polarization
2. Distance between mated mounting flanges: 1.685/1.645. Consult manufacturer if other distance between mated mounting flanges is required
3. Misalignment capabilities are possible with mated pair reference Glenair connector 253-019.
4. See Space-Grade guidelines material, in this section, for outgassing/screening options available
5. Stainless steel locating pin (Ø.079) shipped with each -07 jam-nut receptacle connector
6. For feed-thru connector configurations that are either pin/pin or socket/socket, the position identification/ marking on the D38999 side of the connector will be as shown in MIL-STD-1560. The blind mate separation side will be the reverse identification marking
7. Blind mate side mates with 253-019 with reverse silkscreen marking for contact type PP (pin on both sides) or SS (socket on both sides)
8. Kick-off spring is not intended to offset all of the contact retention force for each insert arrangement
9. Material/finish
   - Shell, jam-nut coupling nut: see part number development, finish
   - Spring: CRES/passivated
   - Insulators: high grade rigid dielectric/N.A.
   - O-ring: fluorosilicone blend
   - Contacts: copper alloy/gold plated

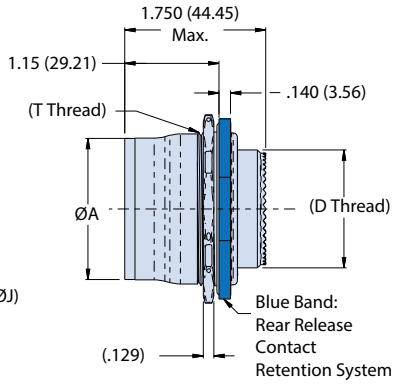
Space-grade, blind mate connectors
Floating jam-nut mount receptacle
for use with 253-018 bulkhead feed-thru

Part Number Development						
Sample Part Number	**253-019**	**-07**	**ME**	**25-35**	**S**	**N**
Series / Basic Part No.	**253-019** = Blind-mate receptacle for use with 253-018 bulkhead feed-thru					
Connector Mounting	**07** = Jam-nut mount (float mount), receptacle **007** = Jam-nut mount (float mount), receptacle; reverse silkscreen marking					
Material/Finish	**ME** = Aluminum, electroless nickel **ZL** = CRES, electrodeposited nickel **MT** = Aluminum, nickel PTFE **Z1** = CRES, passivated					
Shell Size-Insert Arrangement*	Per MIL-STD-1560; symmetrical layouts only, consult factory for complete details					
Contact Type	**S** = Socket, crimp removable **P** = Pin, crimp removable					
Alternate Polarization*	**A** = 40°, **B** = 65°, **C** = 80°, **D** = 210°, **E** =250°, **F** = 280°, **G** = 310°, **H**= 330°, **N** = 135° (Normal) Per L°. G6 only Refers to blind mate side. Plug/Receptacle side per MIL-DTL-38999					

***Refer to section A for complete details.** Refer to Space-Grade Guidelines material (IAW NASA EEE INST-002) for outgassing and screening modification codes, on pages 60 and 61. Modification codes may be added directly to the end of any valid part number

253-019 FLOATING JAM-NUT MOUNT RECEPTACLE WITH MISALIGNMENT ACCOMMODATION AND OPTIONAL SEALING: MATES WITH 253-018 BULKHEAD FEED-THRU





Dimensions for 253-019-07 Jam Nut Receptacle								
Shell Size	**F Flange**	**H (End of Slot) 0.0/-.008(0.0/-.20)**	**Ø J Jam Nut**	**N, Jam Nut Flat ±.010 (±.25)**	**M, Flange Flats ±.010 (±.25)**	**T Thread Class 2A**	**D Thread Class 2A**	**Ø A ±.010 (±.25)**
13	1.640 (41.66)	0.729 (18.52)	1.500 (38.10)	1.300 (33.02)	1.390 (35.31)	1.125-18 UNEF	.6875-24	.970 (24.64)
15	1.750 (44.45)	0.791 (20.09)	1.625 (41.28)	1.450 (36.83)	1.515 (38.48)	1.250-18 UNEF	.8125-20	1.105 (28.07)
21	2.180 (55.37)	1.017 (25.83)	2.063 (52.40)	1.875 (47.63)	1.955 (49.66)	1.625-18 UNEF	1.1875-18	1.475 (37.47)
23	2.315 (58.80)	1.076 (27.33)	2.141 (54.38)	2.010 (51.05)	2.080 (52.83)	1.750-18 UNS	1.3125-18	1.595 (40.51)
25	2.330 (59.18)	1.100 (27.94)	2.300 (58.42)	2.125 (53.98)	2.195 (55.75)	1.875-16 UN	1.4375-18	1.720 (43.69)

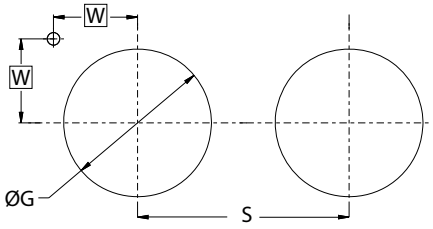
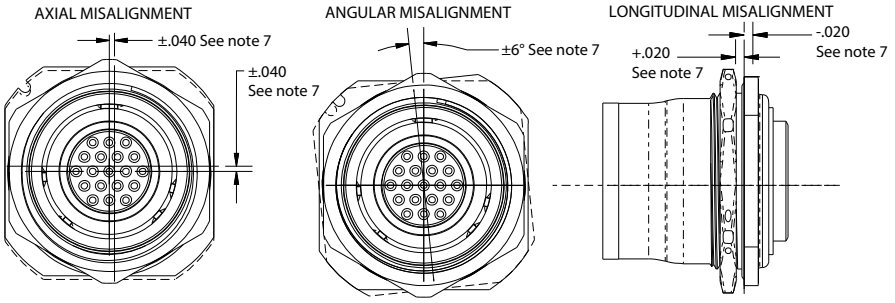


Table IV 253-019-07 Panel Cut-Out		
Shell Size	**Ø G, Thru-Hole ±.004**	**W (Basic)**
13	1.134 (28.80)	.549 (13.94)
15	1.259 (31.98)	.593 (15.06)
21	1.634 (41.50)	.753 (19.13)
23	1.759 (44.68)	.797 (20.24)
25	1.884 (47.85)	.810 (20.57)

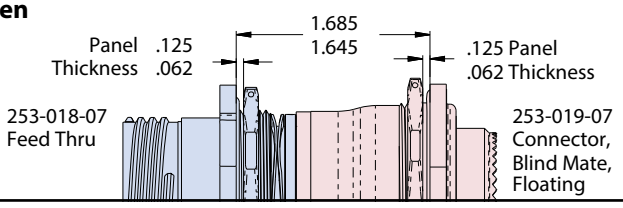
Space-grade, blind mate connectors
Floating jam-nut mount receptacle
for use with 253-018 bulkhead feed-thru

253-019 Misalignment Capabilities



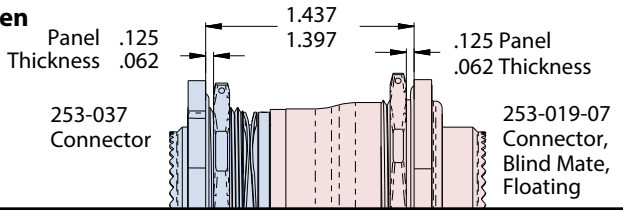
Distance between mated flanges.

For reference only (not deliverable)



Distance between mated flanges.

For reference only (not deliverable)



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NOTES:

1. Connector mates with Glenair 253-018 and 253-037 fixed series connectors having same insert arrangement and polarization.
2. Distance between mated mounting flanges as shown. Consult manufacturer if other distance between mated mounting flanges is required.
3. Misalignment capability as shown.
4. See Space-Grade guidelines material, in this section, for outgassing/screening options available
5. Stainless steel locating pin (Ø.079) shipped with each connector
6. Contact factory for PC tail versions.
7. Dimensions and features are intended for customer use only. Dimensions are reference only and not measured during final inspection at factory.
8. Connector style 007, jam nut mount with reverse silkscreen marking is used when mating to 253-018 feed-thru connector that is contact type PP (pin on both sides) or SS (socket on both sides).
9. Material/finish
   - Shell, jam-nut: see part number development, finish
   - Spring: CRES/passivated
   - Insulators: high grade rigid dielectric/N.A.
   - Seals: fluorosilicone blend, silicone
   - Contacts: copper alloy/gold plated

Space-grade, blind mate connectors
Plug, jam-nut mount
with assisted kick-off (spring force)

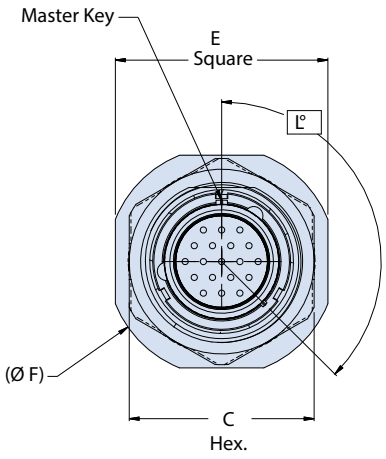
SuperNine®

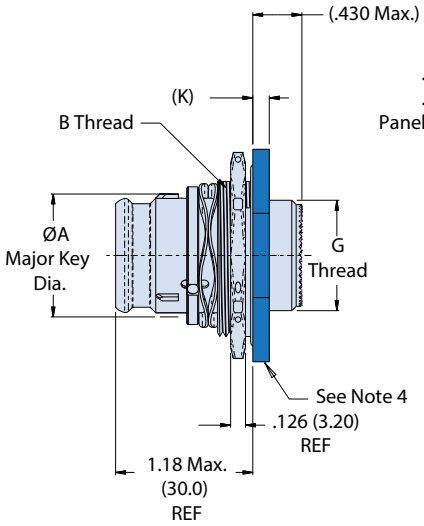
Part Number Development						
Sample Part Number	**253-031**	**-07**	**ME**	**25-35**	**P**	**N**
Series / Basic Part No.	**253-031** Blind-mate plug with non-adjustable assisted separation					
Connector Mounting	**-07** = Fixed jam-nut mount plug					
Material/Finish	**ME** = Aluminum, electroless nickel **ZL** = CRES, electrodeposited nickel **MT** = Aluminum, nickel PTFE **Z1** = CRES, passivated					
Shell Size-Insert Arrangement*	Per MIL-STD-1560					
Contact Type	**P** = Pin, crimp removable **A** = Pin insert less contacts **S** = Socket, crimp removable **B** = Socket insert less contacts					
Alternate Polarization*	**A** = 40°, **B** = 65°, **C** = 80°, **D** = 210°, **E** =250°, **F** = 280°, **G** = 310°, **H**= 330°, **N** = 135° (Normal) Per L° BSC. Refers to blind mate side.					

***Refer to section A for complete details.** Refer to Space-Grade Guidelines material (IAW NASA EEE INST-002) for outgassing and screening modification codes, on pages 60 and 61. Modification codes may be added directly to the end of any valid part number

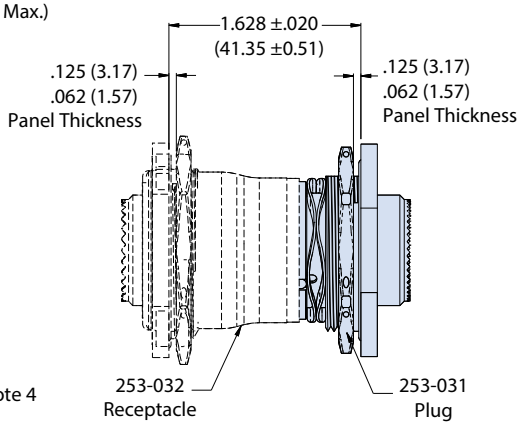
253-031 BLIND-MATE JAM-NUT MOUNT PLUG WITH KICK-OFF SPRING AND ACCESSORY THREADS

07 - Receptacle, Jam Nut Mount





Mated Jam Mount Connectors



*Dimensions shown are for reference only and not intended to be verified during final inspection

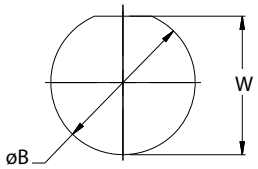
NOTES:

1. Connector mates with Glenair 253-032 series connector, having the same insert arrangement and polarization.
2. Insert arrangement is in accordance with MIL-STD-1560 arrangements only. Contact manufacturer for availability.
3. See Space-Grade guidelines material, in this section, for outgassing/screening options available
4. Blue color band indicates rear release contact retention mechanism.
5. Kick-off spring is not intended to offset all of the contact retention force for each insert arrangement
6. Material/ finish:
   - Shell, jam-nut: see part number development table, finish
   - Insulators: high grade rigid dielectric / N.A.
   - Contacts: copper alloy/gold plated
   - O-ring: fluorosilicone blend / N.A.

Space-grade, blind mate connectors
Plug, jam-nut mount
with assisted kick-off (spring force)

Dimensions							
Shell Size	ØA Max	Thd B Class 2A	C Max	E ±.016(0.4)	ØF Max	G Thd Class 2A	K .011/-.010 (.28/.25)
11	.673 (17.09)	1.0000-20 UNEF	1.181 (30.00)	1.375 (34.92)	1.511 (38.38)	.5625-24	.109 (2.77)
13	.798 (20.27)	1.1250-18 UNEF	1.300 (33.02)	1.500 (38.10)	1.636 (41.55)	.6875-24	.109 (2.77)
15	.923 (23.44)	1.2500-18 UNEF	1.457 (37.01)	1.625 (41.28)	1.761 (44.73)	.8125-20	.109 (2.77)
17	1.048 (26.62)	1.3750-18 UNEF	1.575 (40.00)	1.812 (46.02)	1.949 (49.50)	.9375-20	.140 (3.56)
19	1.173 (29.79)	1.5000-18 UNEF	1.693 (43.00)	1.938 (49.23)	2.073 (52.65)	1.0625-18	.140 (3.56)
21	1.298 (32.97)	1.6250-18 UNEF	1.811 (46.00)	2.062 (52.37)	2.200 (55.88)	1.1875-18	.140 (3.56)
23	1.423 (36.14)	1.7500-18 UNS	2.016 (51.21)	2.187 (55.55)	2.323 (59.00)	1.3125-18	.140 (3.56)
25	1.548 (39.32)	1.8750-16 UNS	2.125 (53.97)	2.312 (58.72)	2.448 (62.18)	1.4375-18	.140 (3.56)

C



Recommended Panel Cutout		
Shell Size	Ø B .010/-.000 (0.25/.00)	W +.000/-.010 (.00/-.25)
11	1.010	0.955
13	1.135	1.085
15	1.260	1.210
17	1.385	1.335
19	1.510	1.460
21	1.635	1.585
23	1.760	1.710
25	1.885	1.835

Space-grade, blind mate connectors

SuperNine®

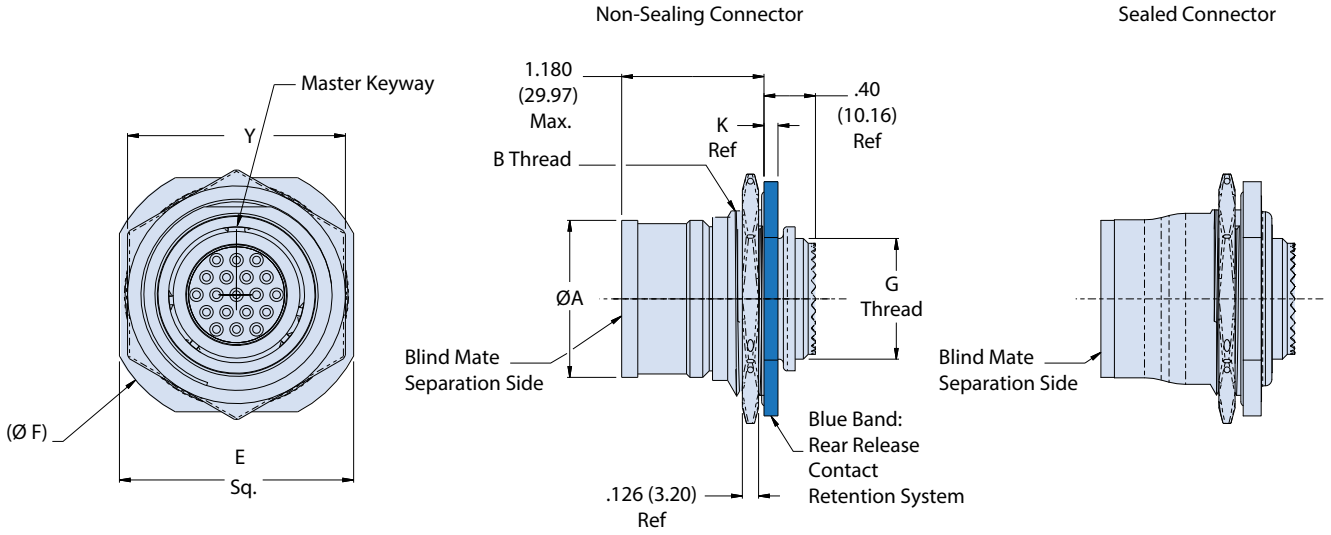
Blind-mate floating jam-nut mount receptacle

with misalignment accommodation; for use with 253-031 plug

Part Number Development							
Sample Part Number	**253-032**	**-07**	**ME**	**25-35**	**S**	**N**	**NS**
Series / Basic Part No.	**253-032** = Blind-mate receptacle for use with 253-031plug						
Connector Mounting	**-07** = Floating jam nut mount receptacle						
Material/Finish	**ME** = Aluminum, electroless nickel **ZL** = CRES, electrodeposited nickel **MT** = Aluminum, nickel PTFE **Z1** = CRES, passivated						
Shell Size-Insert Arrangement*	Per MIL-STD-1560; Symmetrical layouts only, consult factory for complete details.						
Contact Type	**P** = Pin, crimp removable **A** = Pin insert less contacts **S** = Socket, crimp removable **B** = Socket insert less contacts						
Alternate Polarization*	**A** = 40°, **B** = 65°, **C** = 80°, **D** = 210°, **E** =250°, **F** = 280°, **G** = 310°, **H**= 330°, **N** = 135° (Normal) Per L° BSC. Refers to blind mate side.						
Non Sealing	**NS** = Non-Sealing (omit for external elastomer seal version)						

***Refer to section A for complete details.** Refer to Space-Grade Guidelines material (IAW NASA EEE INST-002) for outgassing and screening modification codes, on pages 60 and 61. Modification codes may be added directly to the end of any valid part number

253-032 FLOATING JAM-NUT MOUNT RECEPTACLE WITH MISALIGNMENT ACCOMMODATION; MATES WITH 253-031 ONLY



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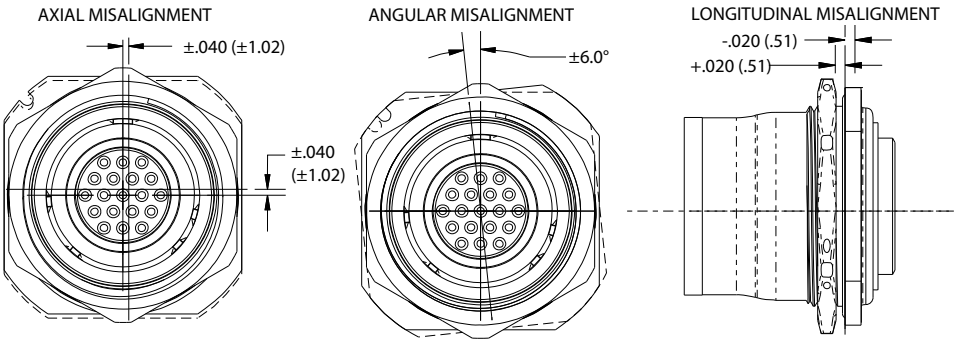
NOTES:

1. Connector mates with Glenair 253-031 series connector, having the same insert arrangement and polarization.
2. Insert arrangement is in accordance with MIL-STD-1560 arrangements only. Contact manufacturer for availability.
3. Misalignment capabilities are possible when mated with Glenair connector 253-031
4. See Space-Grade guidelines material, in this section, for outgassing/screening options available
5. Material/ finish:
   - Shell, flange, jam-nut: see part number development, finish
   - Wave spring: CRES 17-7PH/passivate
   - Insulators: high grade rigid dielectric/N.A.
   - Contacts: copper alloy/gold plated
   - O-ring: fluorosilicone blend/N.A.

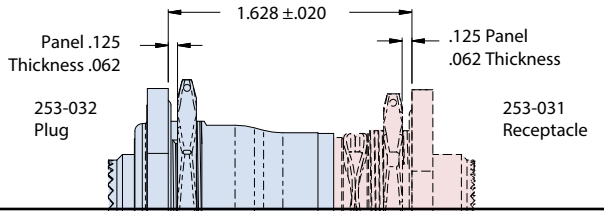
Space-grade, blind mate connectors
Floating jam-nut mount receptacle
with misalignment accommodation; for use with 253-031 plug

Misalignment Capabilities



Distance between mated flanges.

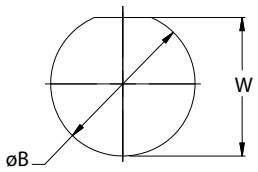
For reference only
(not deliverable)



C

Dimensions							
Shell Size	ØA Max	B Thd, Class 2A	Y Hex	E ±.016 (0.41)	Ø F Max	Thd G, Class 2A	K .011/-.010 (0.28/ 0.25)
11	.853 (21.67)	1.1250-18 UNEF	1.300 (33.02)	1.391 (35.33)	1.641 (41.68)	.5625-24	.109 (2.77)
13	.978 (24.84)	1.2500-18 UNEF	1.457 (37.01)	1.516 (38.51)	1.750 (44.45)	.6875-24	.109 (2.77)
15	1.103 (28.02)	1.3750-18 UNEF	1.575 (40.00)	1.641 (41.68)	1.938 (49.23)	.8125-20	.109 (2.77)
17	1.228 (31.19)	1.5000-18 UNEF	1.693 (43.00)	1.828 (46.43)	2.062 (52.37)	.9375-20	.140 (3.56)
19	1.353 (34.37)	1.6250-18 UNEF	1.811 (46.00)	1.954 (49.63)	2.188 (55.58)	1.0625-18	.140 (3.56)
21	1.478 (37.54)	1.7500-18 UNS	2.010 (51.05)	2.078 (52.78)	2.312 (58.72)	1.1875-18	.140 (3.56)
23	1.603 (40.72)	1.8750-16 UNS	2.209 (56.11)	2.128 (54.05)	2.327 (59.11)	1.3125-18	.140 (3.56)
25	1.728 (43.89)	2.0000-16 UN	2.334 (59.28)	2.253 (57.23)	2.452 (62.28)	1.4375-18	.140 (3.56)

Recommended Panel Cutout		
Shell Size	Ø B .010/-.000 (0.25/.00)	W +.000/-.010 (.00/-.25)
11	1.135 (28.83)	1.085 (27.56)
13	1.260 (32.00)	1.210 (30.73)
15	1.385 (35.18)	1.335 (33.91)
17	1.510 (38.35)	1.460 (37.08)
19	1.635 (41.53)	1.585 (40.26)
21	1.760 (44.70)	1.710 (43.43)
23	1.885 (47.88)	1.835 (46.61)
25	2.010 (51.05)	1.960 (49.78)

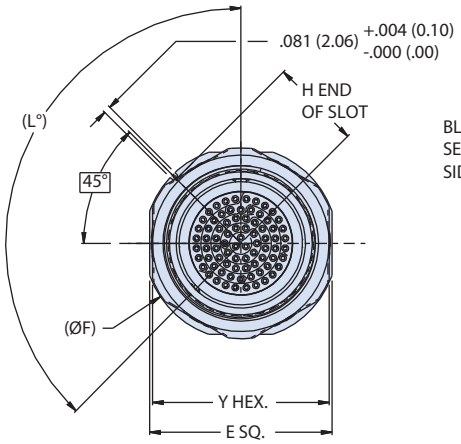


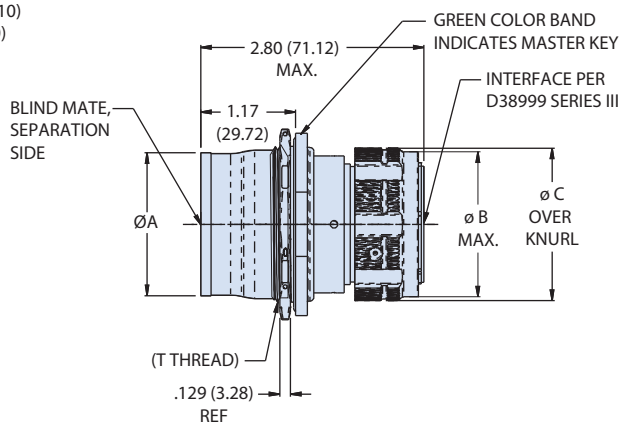
Space-grade, blind-mate connectors
Feed-thru receptacle, with D38999 type plug
IAW MIL-DTL-38999 Series III

Part Number Development						
Sample Part Number	**253-033**	**-07**	**ME**	**25-35**	**PP**	**N**
Series / Basic Part No.	**253-033** = Floating jam-nut mount, feed-thru receptacle with rear D38999 Series III plug interface. Receptacle interface also available, contact factory					
Connector Style	**-07** = Jam-nut mount, float mount					
Material/Finish	**ME** = Aluminum, electroless nickel **ZL** = CRES, electrodeposited nickel **MT** = Aluminum, nickel PTFE **Z1** = CRES, passivated					
Shell Size-Insert Arrangement*	Per MIL-STD-1560; symmetrical layouts only, consult factory for complete details					
Contact Type	**PP** = Pin on both sides **BSDP** = Blind-mate side socket - D38999 side pin **SS** = Socket on both sides **BPDS** = Blind-mate side pin - D38999 side socket					
Alternate Polarization*	**A** = 40°, **B** = 65°, **C** = 80°, **D** = 210°, **E** =250°, **F** = 280°, **G** = 310°, **H**= 330°, **N** = 135° (Normal) Per L°. Refers to blind mate side. Plug side per MIL-DTL-38999. See alternate polariztions table					

***Refer to section A for complete details.** Refer to Space-Grade Guidelines material (IAW NASA EEE INST-002) for outgassing and screening modification codes, on pages 60 and 61. Modification codes may be added directly to the end of any valid part number

253-033 FLOAT MOUNT FEED-THRU, JAM NUT MOUNT RECEPTACLE TO 38999 TYPE SERIES III PLUG MATING INTERFACE





Alternate Polarizations	
ID	**L°**
N	135°
A	40°
B	65°
C	80°
D	210°
E	250°

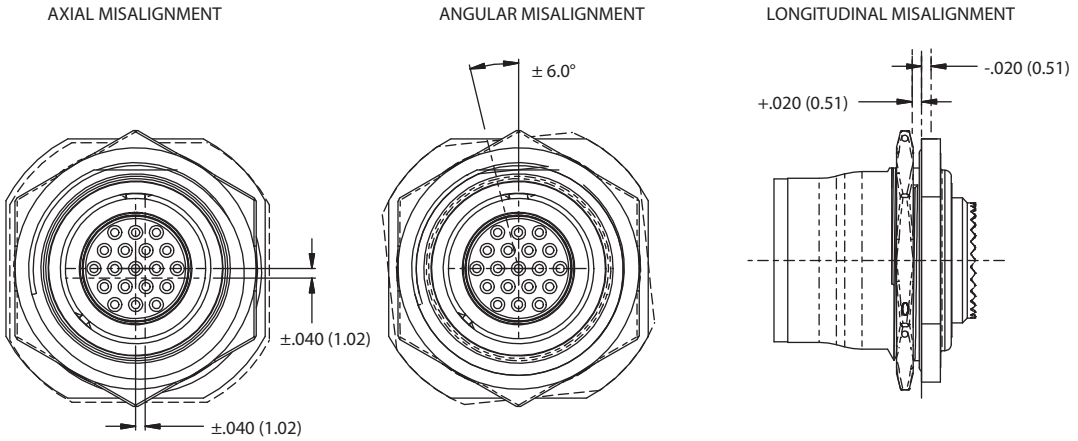
Dimensions for 253-033								
Shell Size	**Ø A Max**	**T Thread Class 2A**	**Y Hex Flats**	**E flange ±.016**	**ØF Flange**	**H End of Slot +0/-.008**	**ØB Max**	**ØC Max**
13	.978	1.1250-18 UNEF	1.300 (33.02)	1.391 (35.33)	1.6441 (41.76)	.729 (18.52)	1.050 (26.67)	1.200 (30.48)
15	1.103	1.2500-18 UNEF	1.457 (37.01)	1.516 (38.51)	1.750 (44.45)	.791 (20.09)	1.180 (29.97)	1.320 (33.53)
23	1.603	1.7500-18 UNEF	2.010 (51.05)	2.078 (52.78)	2.312 (58.72)	1.072 (27.23)	1.670 (42.42)	1.790 (45.47)
25	1.728	1.8750-18 UNEF	2.125 (53.97)	2.200 (55.88)	2.327 (59.11)	1.096 (27.84)	1.800 (45.72)	1.920 (48.77)

NOTES:

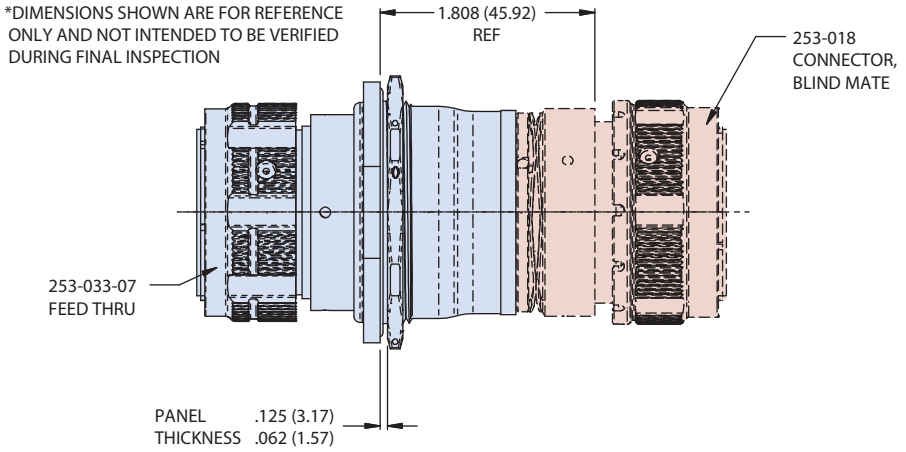
1. Distance between mated mounting flanges: 1.808 Consult manufacturer other distance between mounting flanges is required
2. See Space-Grade guidelines material, in this section, for outgassing/screening options available
3. Stainless steel locating pin (Ø.079) shipped with each connector
4. Misalignment capabilities are possible with mated pair reference Glenair connector 253-019

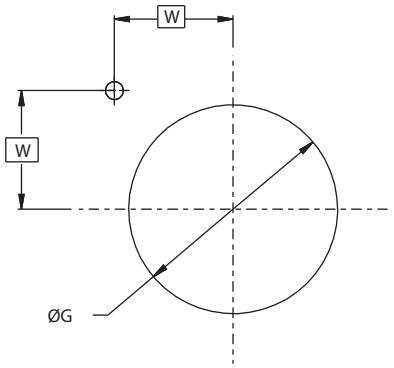
Space-grade, blind-mate connectors
Feed-thru receptacle, with D38999 type plug
IAW MIL-DTL-38999 Series III

MISALIGNMENT CAPABILITIES (see note 4)



Distance Between Mated Flanges





Recommended Panel Cut-out		
Shell Size	ØG, Thru Hole ±0004 (0.10)	W Basic
13	1.134 (28.80)	.549 (13.94)
15	1.259 (31.98)	.593 (15.06)
23	1.759 (44.68)	.797 (20.24)
25	1.884 (47.85)	.809 (20.55)

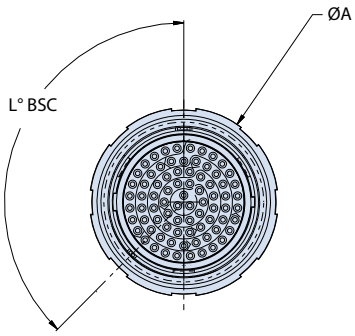
Space-grade, blind mate connectors
Locking circuit and test mate connector
IAW MIL-DTL-38999 Series III

SuperNine®

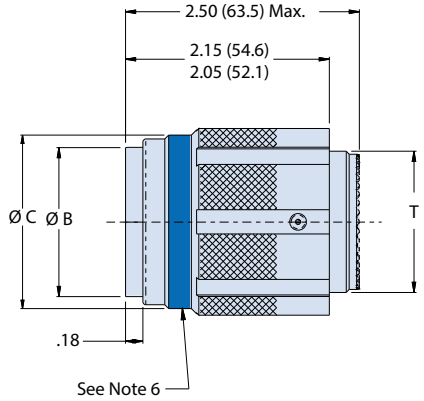
Part Number Developement						
Sample Part Number	**253-025**	**-G6**	**ME**	**23-43**	**P**	**N**
Series / Basic Part No.	**253-025** = Locking circuit and test mate connector					
Connector Mounting	**-G6** = In-line					
Material/Finish	**ME** = Aluminum, electroless nickel **ZL** = CRES, electrodeposited nickel **MT** = Aluminum, nickel PTFE **Z1** = CRES, passivated					
Shell Size-Insert Arrangement*	Per MIL-STD-1560					
Contact Type	**P** = Pin, crimp removable **A** = Pin insert less contacts **S** = Socket, crimp removable **B** = Socket insert less contacts					
Alternate Polarization*	**A** = 40°, **B** = 65°, **C** = 80°, **D** = 210°, **E** =250°, **F** = 280°, **G** = 310°, **H**= 330°, **N** = 135° (Normal) Per L° Basic. Refers to blind mate side. Plug side per MIL-DTL-38999. See alternate polariztions table					

***Refer to section A for complete details.** Refer to Space-Grade Guidelines material (IAW NASA EEE INST-002) for outgassing and screening modification codes, on pages 60 and 61. Modification codes may be added directly to the end of any valid part number

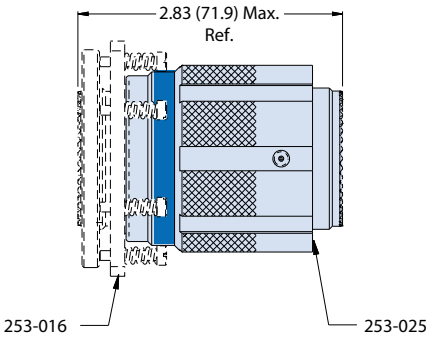
253-025 LOCKING CIRCUIT AND TEST MATE CONNECTOR, MATES WITH 253-016 PLUG



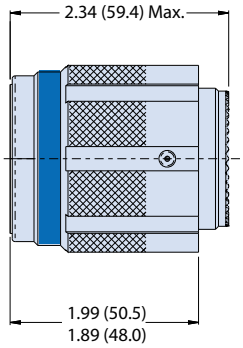
Ready To Mate



Mated Pair (Reference Only)
See Note 4



Mated



Dimensions				
Shell Size	**Ø A Max**	**Ø B**	**Ø C**	**T Thd 1.0-6g -0.100R**
17	1.55 (39.37)	1.10 (27.94)	1.29 (32.77)	M25
25	2.05 (52.07)	1.54 (39.12)	1.79 (45.47)	M37

NOTES:

1. Material/ finish:
   - Shell, coupling ring, segments - see part number development, finish
   - Insulators - high grade rigid dielectric / N.A.
   - Contacts - copper alloy / gold plated
2. Connector mates with Glenair 253-016 series connector, having the same insert arrangement and polarization.
3. Insert arrangement is in accordance with MIL-STD-1560 arrangements only. Contact manufacturer for availability.
4. Connector mated with Glenair 253-016 is shown for reference only.
5. See Space-Grade guidelines material, in this section, for outgassing and screening options available
6. Blue color band indicates rear release contact retention system

C

JAM-FREE LAUNCHING

AS81703 Series 3 Type Lanyard Connectors

Ideal for high shock / high vibration environments including military space and defense applications such as missile and space payload deployment, the AS81703 provides jam-free, push-on, pull-off operation. Glenair's AS81703 Series 3 type connector series is intermateable and intermountable with currently available AS81703 mil-spec and commercial connectors, and offers several enhancements to the standard design: an integrated band porch for shield termination, 360° saw teeth for rear-end accessory clocking, and a red full-mate indicator stripe. The AS81703 Series 3 type connector is ideally suited for droppable stores, umbilical connect, air launch to orbit, and other extreme vibration and shock environments where rugged and reliable lanyard-release and push-pull mating is a must. Nineteen contact arrangements are available, including hybrid signal/power layouts, and a full complement of backshells and connector accessories is offered—with Glenair's high availability and quick delivery.

- **Intermateable and intermountable with available AS81703 connectors**
- **Signal, power, and high-speed shielded contact arrangements**
- **Reliable fail-safe axial-pull lanyard equipped coupling**
- **Instant disconnect for critical quick-release systems**
- **Available integrated band porch for easy shield termination**
- **360° saw teeth for accessory clocking**
- **Red full-mate indicator stripe**
- **Blind mate and rack-and-panel versions available**
- **Available backshells and accessories IAW AS81703**
- **Polarization keying for mis-mate prevention**

LANYARD-RELEASE

AS81703 Series 3 Type Connectors

Table of contents / selection guide

D

AS81703 Series 3 Type Connectors

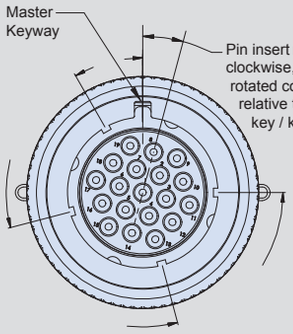
How to order

How To Order								
Sample Part Number	**253-020**	**–**	**06**	**ME**	**19-7**	**P**	**N**	
Basic Part Number	AS81703 Series 3 type connector							
Rear Option	**–** = Accessory threads **B** = Band porch (consult factory)							
Connector Style (and AS cross-ref)	**00** = Sq. flange mount receptacle AS34241 type (MS3424) **06** = Straight plug AS34671 type (MS3467) **07** = Jam nut mount receptacle AS34641 type (MS3464 **08** = Lanyard release plug MS3468 type (no SAE equivalent) **09** = Rack & panel plug AS34461 type (MS3446)							
Material / Finish	See Table I							
Shell Size / Insert Arrangement	See Table II, diagrams on pgs. 4–5							
Contact Styles	**P** = Pin insert **A** = Pin insert less contacts (not available for -09 Plug) **S** = Socket insert **B** = Socket insert less contacts (not available for -09 Plug)							
Insert Clocking Positions	**N**, **W**, **X**, **Y**, **B**, **C** (See Table III)							
Lanyard Ring Mod. Code (-08 Receptacle Only)	**Omit** = Standard Lanyard Ring **812** = Lanyard Ring Rotated 90° from Master Keyway							

Table I - Material and Finish

Code	Mil Class	Material	Finish
C	-	Aluminum Alloy	Black Anodize
ME	E		Electroless Nickel
NF	L		O.D. Cadmium over Electroless Nickel
MT	-		Nickel-PTFE
ZR	-		Zinc-Nickel/Black (Tri-Valent CR)

Insert Rotation and Insert Clocking Rotation



AS81703 Series 3 type connectors feature locksmith key/keyways. Plug connector keyways and receptacle connector keys are fixed for all sizes and contact arrangements.

Alternate Insert Clocking is specified in the part number. Pin inserts are rotated clockwise, Socket inserts rotated counter-clockwise relative to the master key/keyway, to the positions indicated in the table below.

Table II: Contact Arrangements

Contact Arrangement	Contact Size & Quantity		
	#20	#16	#12
3-50	3		
7-50	7		
12-6	6		
12-50	12		
19-4			12
19-7			7
19-12		12	
19-50	19		
27-2		14	
27-3	14	2	
27-5		19	
27-8		6	4
27-11	12		
27-50	27		
37-2		24	
37-3			12
37-50	37		
61-42	29	4	8
61-50	61		

Table III: Clocking Positions

Contact Arrangement	Alternate Insert Clocking Positions					
	N	W	X	Y	B	C
3-50	0°			75°		
7-50	0°				150°	
12-6	0°	25°	45°	80°	150°	220°
12-50	0°	15°	50°	75°	150°	225°
19-4	0°			22° 30'	135°	247° 30'
19-7	0°			75°	150°	225°
19-12	0°	25°	50°	75°	150°	225°
19-50	0°			75°	150°	225°
27-2	0°	25°	50°	75°	150°	225°
27-3	0°	25°	50°	75°	150°	225°
27-5	0°			75°	150°	225°
27-8	0°	25°	50°	75°	150°	225°
27-11	0°	25°	50°	75°	150°	225°
27-50	0°	25°	50°	75°	150°	225°
37-2	0°	25°	145°	227° 30'		
37-3	0°	20°	70°			
37-50	0°	25°	50°	75°	150°	225°
61-42	0°		67° 30'			
61-50	0°			75°	150°	225°

AS81703 Series 3 Type Connectors

General information / test report summary

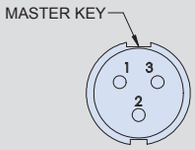
<table>
<tr><th colspan="3">Validation Test Summary. Tested IAW AS81703</th></tr>
<tr><th>Test</th><th>Requirement</th><th>Result</th></tr>
<tr><td>Magnetic Permeability</td><td>Relative Magnetic Permeability: ≤ 2.0 Mu</td><td>Pass</td></tr>
<tr><td>Maintenance Aging and Contact Forces</td><td>Insertion Force: ≤ 15 lbs.• Removal Force: ≤ 10 lbs.</td><td>Pass</td></tr>
<tr><td>Gage Location and Retention</td><td>Axial Displacement of the Test Gages: ≤ 0.012</td><td>Pass</td></tr>
<tr><td>Operating Forces</td><td>
<table>
<tr><th>Shell Size</th><th>Max Engagement force (lb)</th><th>Measured Engagement force (lb)</th><th>Min Disengagement force (lb)</th><th>Max Disengagement force (lb)</th><th>Measured Disengagement force (lb)</th></tr>
<tr><td rowspan="2">12</td><td rowspan="2">34</td><td>15.2</td><td rowspan="2">2</td><td rowspan="2">34</td><td>3.80</td></tr>
<tr><td>16.8</td><td>4.05</td></tr>
<tr><td rowspan="2">19</td><td rowspan="2">38</td><td>16.2</td><td rowspan="2">3</td><td rowspan="2">38</td><td>6.75</td></tr>
<tr><td>15.8</td><td>8.06</td></tr>
<tr><td rowspan="2">37</td><td rowspan="2">44</td><td>19.7</td><td rowspan="2">6</td><td rowspan="2">44</td><td>7.56</td></tr>
<tr><td>20.1</td><td>7.72</td></tr>
</table>
</td><td>Pass</td></tr>
<tr><td>Insulation Resistance, Room Temperature</td><td>Insulation resistance shall be >10,000 megohms</td><td>Pass</td></tr>
<tr><td>Dielectric Withstanding Voltage</td><td>No evidence of breakdown or flashover. Leakage Current ≤ 5 mA
<table>
<tr><th>Condition</th><th>Service Rating I</th><th>Service Rating II</th></tr>
<tr><td>Sea Level</td><td>600 V AC</td><td>1000 V AC</td></tr>
<tr><td>70,000 ft.</td><td>300 V AC</td><td>450 V AC</td></tr>
</table>
</td><td>Pass</td></tr>
<tr><td>Thermal Shock</td><td>Low Temperature: -55° ± 3°C • High Temperature: Class L 175° ± 3°C ; Class E, 200° ± 3°C.
5 cycles, 2 hour minimum soak. No damage detrimental to the connector</td><td>Pass</td></tr>
<tr><td>Insert Retention</td><td>Inserts shall not be dislocated from the specified insert position as shown on the applicable MS drawing when an effective pressure differential of 75 lbs.f/in^2 is applied</td><td>Pass</td></tr>
<tr><td>Vibration</td><td>10 to 2,000 Hz and return to 10 Hz in 20 minutes. 12 cycles in 4 hours for X,Y, and Z Axes. Total 12 hrs. Amplitude of 0.06" double amplitude or 20g, whichever is less. Support wires 8" both ends. Electrical load 100 mA max, open circuit <5V. Maximum initial R not to exceed 3 Ohms on individual loops. All samples measured no discontinuity on any axis.</td><td>Pass</td></tr>
<tr><td>Shock</td><td>15g peak value, half-sine pulse, 11ms duration. One shock each direction on 3 major axes.Mated connectors shall not be damaged and there shall be no loosening of parts. All samples measured no discontinuity on any axis.</td><td>Pass</td></tr>
<tr><td>Insulation Resistance, Elevated Temperature</td><td>After an exposure for 1000 hours at 200°C, the insulation resistance shall be greater than 500 megohms, unmated condition</td><td>Pass</td></tr>
<tr><td>Moisture Resistance</td><td>10 cycles, low temperature subcycle 5 cycles. Initial and final mated insulation resistance measured >100Mohms for all samples at 25°, 500V, 12s.</td><td>Pass</td></tr>
<tr><td>Insulation Resistance</td><td>Unmated, 500V, 120x, 10,000 megohms</td><td>Pass</td></tr>
<tr><td>Contact Resistance</td><td>#24 AWG wires crimped to size 20 contacts. Test current 3A, maximum mV drop 45 mV</td><td>Pass</td></tr>
<tr><td>Contact Retention</td><td>Axial load: 15 lb. Duration: 5 sec min. Rate: approx. 1lb/sec. Initial load of 2 lb before measuring contact displacement. Force applied in the direction tending to dislodge the contacts toward the rear of the connector. Displacement shall not exceed 0.012"</td><td>Pass</td></tr>
<tr><td>Magnetic Permeability</td><td>Relative magnetic permeability of connector assemblies < 2.0 Mu</td><td>Pass</td></tr>
<tr><td>Durability</td><td>500 mating cycles with no mechanical or electrical defects detrimental to operation</td><td>Pass</td></tr>
<tr><td>Salt Spray</td><td>Unmated, 48 hours, 20% salt concentration. No exposure of basic metal due to corrosion which will affect performance.</td><td>Pass</td></tr>
<tr><td>Fluid Immersion, Lubricating Oil</td><td>Unmated connectors immersed in MIL-PRF-7808 oil, 20 hours.</td><td>Pass</td></tr>
<tr><td colspan="3">Contact Glenair for complete validation test reports: GT-15-93 (AS81703, series 3, class E) and GT-15-94 (AS81703, series 3, class L).</td></tr>
</table>

MATERIALS/FINISHES

Shells, Jam Nuts, Lockwashers - Aluminum alloy
Insulators - High-grade rigid dielectric
O-Rings, Grommets, Peripheral Seals - Fluorosilicone or equivalent

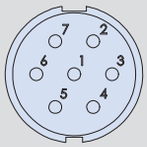
AS81703 Series 3 Type Connectors

Contact arrangements (pin face shown)



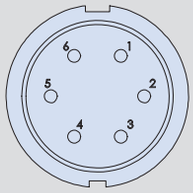
3-50

3X SIZE 20 CONTACT



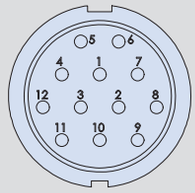
7-50

7X SIZE 20 CONTACT



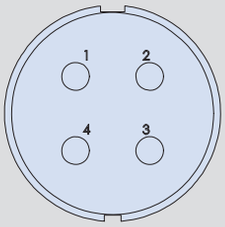
12-6

6X SIZE 20 CONTACT



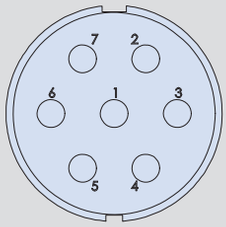
12-50

12X SIZE 20 CONTACT



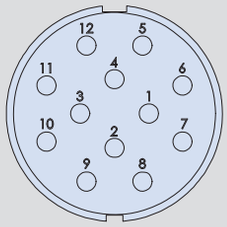
19-4

4X SIZE 12 CONTACT



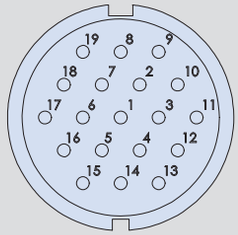
19-7

7X SIZE 12 CONTACT



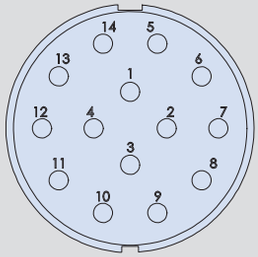
19-12

12 SIZE 16 CONTACT



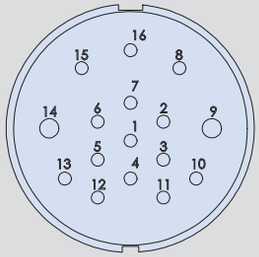
19-50

19X SIZE 20 CONTACT



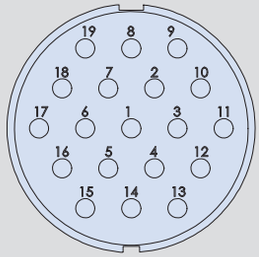
27-2

14X SIZE 16 CONTACT



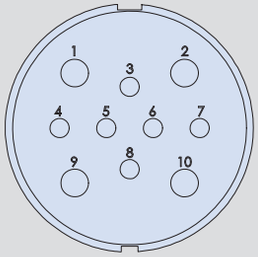
27-3

2X SIZE 16 CONTACT
14X SIZE 20 CONTACT



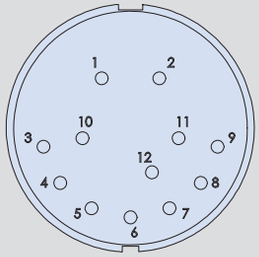
27-5

19X SIZE 16 CONTACT



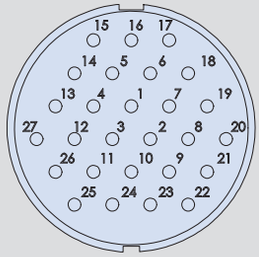
27-8

6X SIZE 16 CONTACT
4X SIZE 12 CONTACT



27-11

12X SIZE 20 CONTACT



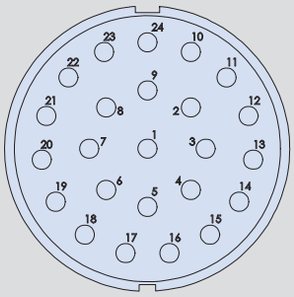
27-50

27X SIZE 20 CONTACT

D

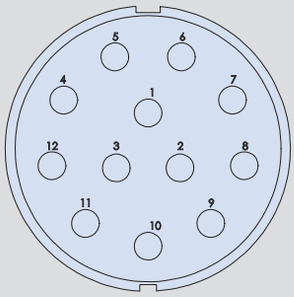
AS81703 Series 3 Type Connectors

Contact arrangements (pin face shown)



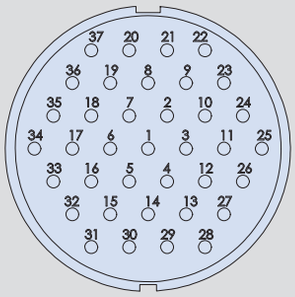
37-2

24X SIZE 16 CONTACT



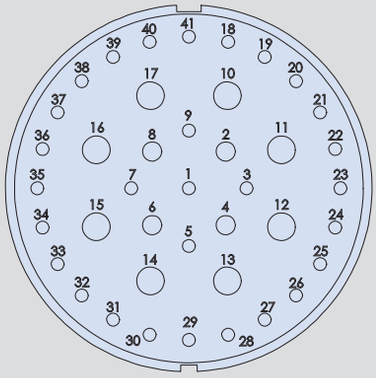
37-3

12X SIZE 12 CONTACT



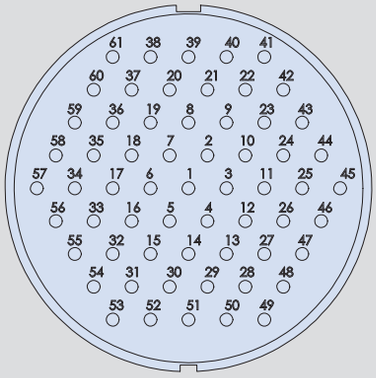
37-50

37X SIZE 20 CONTACT



61-42

4X SIZE 16 CONTACT
29X SIZE 20 CONTACT
8X SIZE 12 CONTACTS



61-50

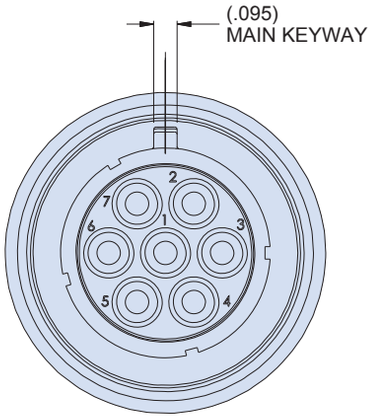
61X SIZE 20 CONTACT

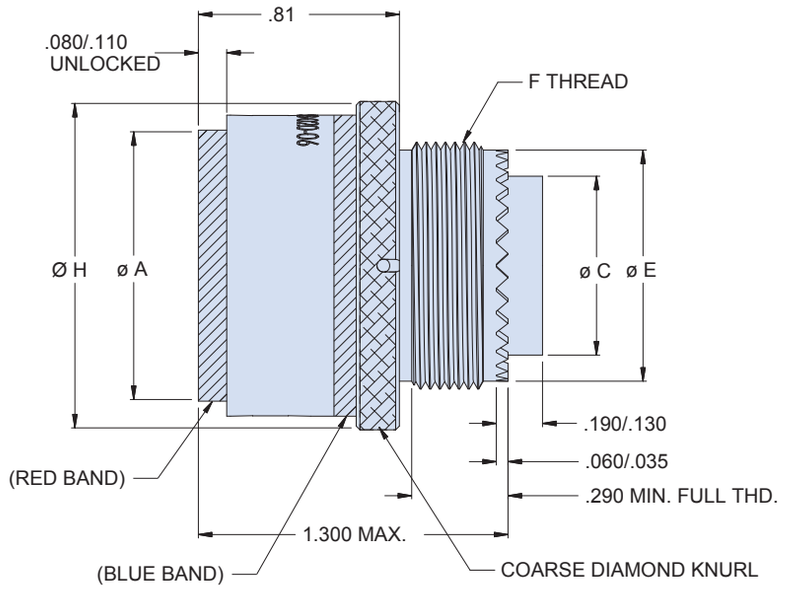
D

Plug

253-020-06

How To Order							
Sample Part Number	**253-020**	**–**	**06**	**ME**	**19-7**	**P**	**N**
Basic Part Number	AS81703 Series 3 type connector						
Rear Option	**–** = Accessory threads **B** = Band porch (consult factory)						
Connector Style	**06** = Straight plug AS34671 type (MS3467)						
Material / Finish	**C** = Al Alloy/Black Anodize **ME** = Al Alloy/Electroless Nickel **NF** = Al Alloy/Cad O.D. Over Electroless Nickel **MT** = Al Alloy/Nickel-PTFE **ZR** = Al Alloy/Zinc-Nickel Black						
Shell Size / Insert Arrangement	See Table II pg. 2, diagrams on pgs. 4–5						
Contact Styles	**P** = Pin insert **A** = Pin insert less contacts **S** = Socket insert **B** = Socket insert less contacts						
Insert Clocking Positions	**N**, **W**, **X**, **Y**, **B**, **C** (See Table III pg. 2)						





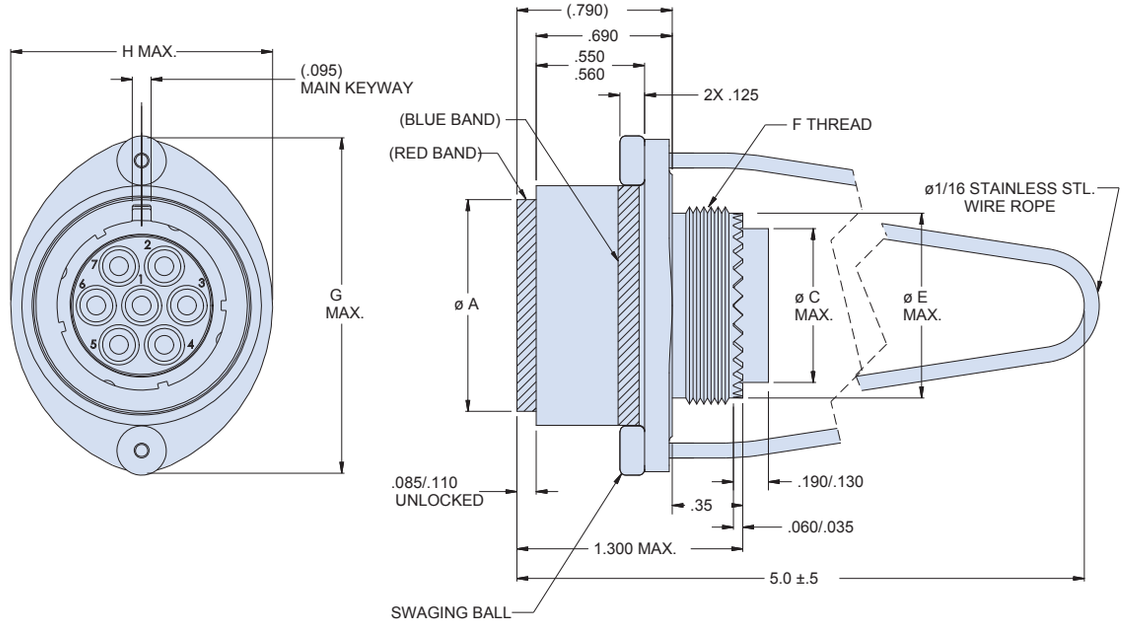
D

-06 Plug Dimensions									
Shell Size	Ø A		Ø C Max.		Ø E Max.		F Thd.	H	
	In. ± .02	mm ± .5	In.	mm	In.	mm		In. ± .025	mm ± .6
3	.657	16.7	.351	8.9	.509	12.9	9/16-24 UNEF-2A	.925	23.5
7	.795	20.2	.531	13.5	.687	17.4	3/4-20 UNEF-2A	1.062	27.0
12	.945	24.0	.665	16.9	.812	20.6	7/8-20 UNEF-2A	1.172	29.8
19	1.090	27.7	.790	20.1	.937	23.8	1-20 UNEF-2A	1.328	33.7
27	1.230	31.2	.869	22.1	.992	25.2	1 1/16-18 UNEF-2A	1.475	37.5
37	1.350	34.3	.994	25.2	1.117	28.4	1 3/16-18 UNEF-2A	1.610	40.9
61	1.620	41.1	1.280	32.5	1.427	36.2	1 1/2-18 UNEF-2A	1.890	48.0

Lanyard-release plug

253-020-08

How To Order								
Sample Part Number	**253-020**	**–**	**08**	**ME**	**19-7**	**P**	**N**	
Basic Part Number	AS81703 Series 3 type connector							
Rear Option	**–** = Accessory threads **B** = Band porch (consult factory)							
Connector Style	**08** = Lanyard release plug MS3468 type (no SAE equivalent)							
Material / Finish	**C** = Al Alloy/Black Anodize **ME** = Al Alloy/Electroless Nickel **MT** = Al Alloy/Nickel-PTFE **NF** = Al Alloy/Cad O.D. Over Electroless Nickel **ZR** = Al Alloy/Zinc-Nickel Black							
Shell Size / Insert Arrangement	See Table II pg. 2, diagrams on pgs. 4–5							
Contact Styles	**P** = Pin insert S = Socket insert **A** = Pin insert less contacts **B** = Socket insert less contacts							
Insert Clocking Positions	**N**, **W**, **X**, **Y**, **B**, **C** (See Table III pg. 2)							
Lanyard Ring Mod. Code	**Omit** = Standard Lanyard Ring **812** = Lanyard Ring Rotated 90° from Master Keyway							



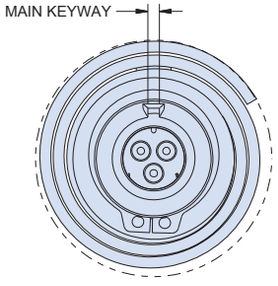
-08 Lanyard-Release Plug Dimensions										
Shell Size	Ø A		Ø C Max.		Ø E Max.		F Thd.	G Max.		H Max.	
	In.	mm	In.	mm	In.	mm		In.	mm	In.	mm
3	.657 .648	16.7 16.5	.351	8.9	.509	12.9	9⁄16-24 UNEF-2A	1.261	32.0	.925	23.5
7	.793 .782	20.1 19.9	.531	13.5	.687	17.4	¾-20 UNEF-2A	1.411	35.8	1.062	27.0
12	.942 .932	23.9 23.7	.665	16.9	.812	20.6	⅞-20 UNEF-2A	1.531	38.9	1.172	29.8
19	1.073 1.063	27.3 27.0	.790	20.1	.937	23.8	1-20 UNEF-2A	1.681	42.7	1.328	33.7
27	1.226 1.216	31.1 30.9	.869	22.1	.992	25.2	1 1⁄16-18 UNEF-2A	1.826	46.4	1.475	37.5
37	1.348 1.338	34.2 34.0	.994	25.2	1.117	28.4	1 3⁄16-18 UNEF-2A	1.915	48.6	1.610	40.9
61	1.614 1.604	41.0 40.7	1.280	32.5	1.427	36.2	1 ½-18 UNEF-2A	2.235	56.8	1.890	48.0

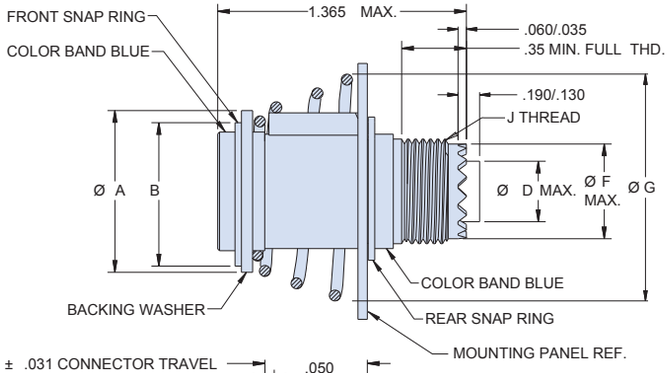
D

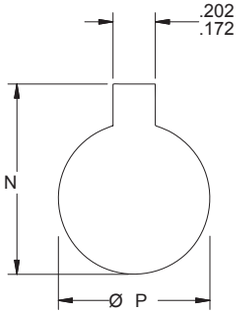
Rack-and-panel plug

253-020-09

How To Order							
Sample Part Number	**253-020**	**–**	**09**	**ME**	**19-7**	**P**	**N**
Basic Part Number	AS81703 Series 3 type connector						
Rear Option	**–** = Accessory threads **B** = Band porch (consult factory)						
Connector Style	**09** = Rack & panel plug AS34461 type (MS3446)						
Material / Finish	**C** = Al Alloy/Black Anodize **ME** = Al Alloy/Electroless Nickel **MT** = Al Alloy/Nickel-PTFE **NF** = Al Alloy/Cad O.D. Over Electroless Nickel **ZR** = Al Alloy/Zinc-Nickel Black						
Shell Size / Insert Arrangement	See Table II pg. 2, diagrams on pgs. 4–5						
Contact Styles	**P** = Pin insert S = Socket insert **A** = Pin insert less contacts **B** = Socket insert less contacts						
Insert Clocking Positions	**N**, **W**, **X**, **Y**, **B**, **C** (See Table III pg. 2)						

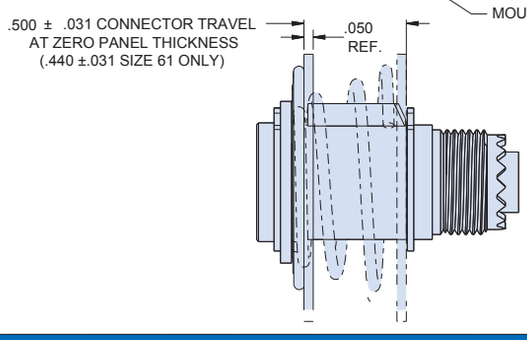






PANEL CUTOUT DETAIL

Panel Cutout Dimensions				
Shell Size	Ø P		N	
	In. ± .015	mm ± .4	In. ± .015	mm ± .4
3	.671	17.0	.843	21.4
7	.812	20.6	.984	25.0
12	.953	24.2	1.109	28.2
19	1.062	27.0	1.234	31.3
27	1.203	30.6	1.375	34.9
37	1.375	34.9	1.531	38.9
61	1.687	42.8	1.859	47.2



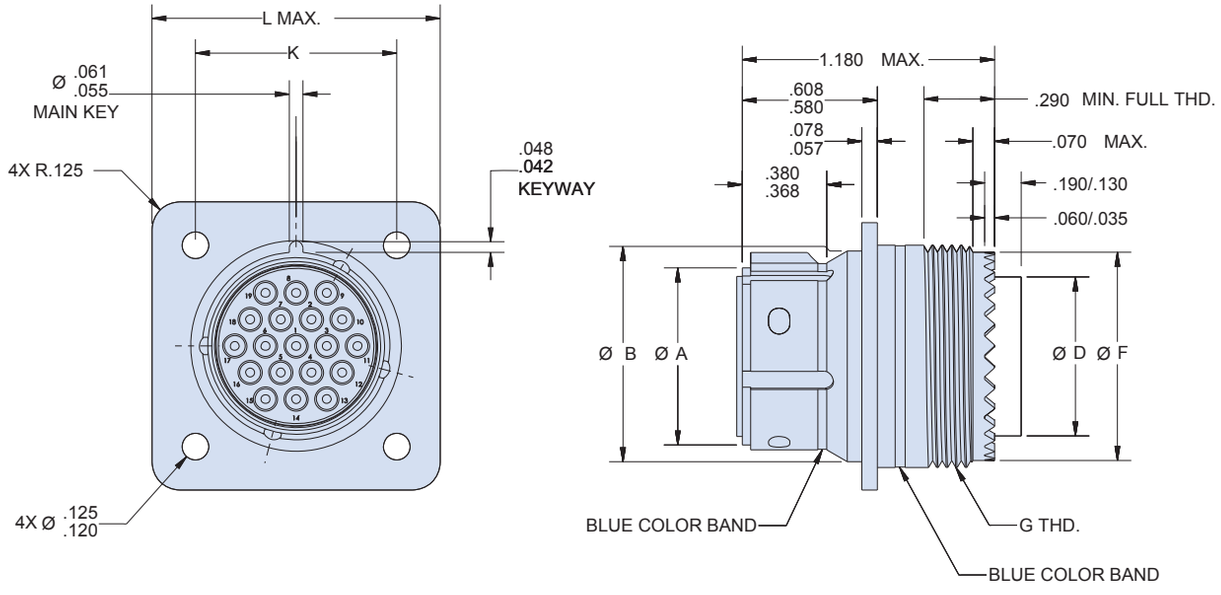
-09 Rack-and-Panel Plug Dimensions												
Shell Size	Ø A		Ø B Max.		Ø D Max.		Ø F Max.		Ø G Max.		J Thd.	Spring force when mated (lbs-In.)
	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm		
3	.891 .869	22.6 22.1	.800	20.3	.351	8.9	.509	12.9	1.225	31.1	9/16-24 UNEF-2A	16 – 20
7	1.172 1.150	29.8 29.2	.990	25.1	.531	13.5	.687	17.4	1.356	34.4	¾-20 UNEF-2A	16 – 20
12	1.263 1.241	32.1 31.5	1.190	30.2	.665	16.9	.812	20.6	1.575	40.0	⅞-20 UNEF-2A	30 – 35
19	1.391 1.369	35.3 34.8	1.320	33.5	.790	20.1	.937	23.8	1.715	43.6	1-20 UNEF-2A	40 – 50
27	1.529 1.507	38.8 38.3	1.475	37.5	.869	22.1	.992	25.2	1.860	47.2	1 1/16-18 UNEF-2A	43 – 50
37	1.816 1.794	46.1 45.6	1.655	42.0	.994	25.2	1.117	28.4	2.120	53.8	1 3/16-18 UNEF-2A	45 – 53
61	2.150 2.118	54.6 53.8	2.025	51.4	1.280	32.5	1.427	36.2	2.850	72.4	1 ½-18 UNEF-2A	75 – 80

D

Wall-mount receptacle

253-020-00

How To Order							
Sample Part Number	**253-020**	**–**	**00**	**ME**	**19-7**	**P**	**N**
Basic Part Number	AS81703 Series 3 type connector						
Rear Option	**–** = Accessory threads **B** = Band porch (consult factory)						
Connector Style	**00** = Sq. flange mount receptacle AS34241 type (MS3424)						
Material / Finish	**C** = Al Alloy/Black Anodize **ME** = Al Alloy/Electroless Nickel **NF** = Al Alloy/Cad O.D. Over Electroless Nickel **MT** = Al Alloy/Nickel-PTFE **ZR** = Al Alloy/Zinc-Nickel Black						
Shell Size / Insert Arrangement	See Table II pg. 2, diagrams on pgs. 4–5						
Contact Styles	**P** = Pin insert **A** = Pin insert less contacts **S** = Socket insert **B** = Socket insert less contacts						
Insert Clocking Positions	**N**, **W**, **X**, **Y**, **B**, **C** (See Table III pg. 2)						



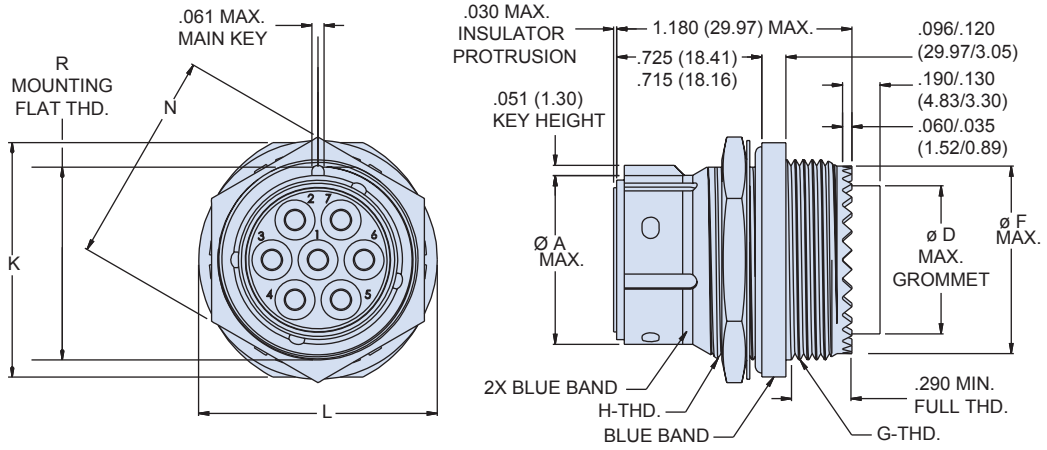
-00 Wall Mount Receptacle Dimensions												
Shell Size	Ø A		Ø B		Ø D Max.		Ø F Max.		G Thd.	K		L Max.	
	In.	mm	In. ±.003	mm ± .1	In.	mm	In.	mm		In.	mm	In.	mm
3	.441 .431	11.2 10.9	.573	14.6	.351	8.9	.509	12.9	9/16-24 UNEF-2A	.625	15.9	.896	22.8
7	.576 .566	14.6 14.4	.686	17.4	.531	13.5	.687	17.4	¾-20 UNEF-2A	.719	18.3	1.021	25.9
12	.710 .700	18.0 17.8	.823	20.9	.665	16.9	.812	20.6	⅞-20 UNEF-2A	.812	20.6	1.114	28.3
19	.849 .839	21.6 21.3	.948	24.1	.790	20.1	.937	23.8	1-20 UNEF-2A	.906	23.0	1.208	30.7
27	1.004 .994	25.5 25.2	1.132	28.8	.869	22.1	.992	25.2	1 1/16-18 UNEF-2A	.968	24.6	1.302	33.1
37	1.126 1.116	28.6 28.3	1.261	32.0	.994	25.2	1.117	28.4	1 3/16-18 UNEF-2A	1.187	30.1	1.458	37.0
61	1.414 1.404	35.9 35.7	1.573	40.0	1.280	32.5	1.427	36.2	1 ½-18 UNEF-2A	1.438	36.5	1.797	45.6

D

Jam nut receptacle

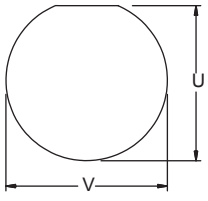
253-020-07

How To Order							
Sample Part Number	**253-020**	**–**	**09**	**ME**	**19-7**	**P**	**N**
Basic Part Number	AS81703 Series 3 type connector						
Rear Option	**–** = Accessory threads **B** = Band porch (consult factory)						
Connector Style	**07** = Jam nut receptacle AS34461 type (MS3446)						
Material / Finish	**C** = Al Alloy/Black Anodize **ME** = Al Alloy/Electroless Nickel **MT** = Al Alloy/Nickel-PTFE **NF** = Al Alloy/Cad O.D. Over Electroless Nickel **ZR** = Al Alloy/Zinc-Nickel Black						
Shell Size / Insert Arrangement	See Table II pg. 2, diagrams on pgs. 4–5						
Contact Styles	**P** = Pin insert S = Socket insert **A** = Pin insert less contacts **B** = Socket insert less contacts						
Insert Clocking Positions	**N**, **W**, **X**, **Y**, **B**, **C** (See Table III pg. 2)						



-07 Jam Nut Receptacle Dimensions

Shell Size	Ø A	Ø D Max.	Ø F Max.	G Thd.	H Thd.	K	L	R	N Mounting Nut
3	.441 (11.20) .431 (10.95)	.351 (8.92)	.509 (12.93)	9/16-24 UNEF-2A	9/16-24 UNEF-2A	.765 (19.43) .735 (18.67)	.765 (19.43) .735 (18.67)	.523 (13.28)	.625 (15.88)
7	.576 (14.63) .566 (14.38)	.531 (13.49)	.687 (17.45)	3/4-20 UNEF-2A	11/16-24 UNEF-2A	.890 (22.61) .860 (21.84)	.890 (22.61) .860 (21.84)	.655 (16.64)	.812 (20.62)
12	.710 (18.03) .700 (17.78)	.665 (16.89)	.812 (20.62)	7/8-20 UNEF-2A	13/16-20 UNEF-2A	1.077 (27.36) 1.047 (26.59)	1.077 (27.36) 1.047 (26.59)	.778 (19.76)	.937 (23.80)
19	.849 (21.56) .839 (21.31)	.790 (20.07)	.937 (23.80)	1-20 UNEF-2A	1-20 UNEF-2A	1.171 (29.74) 1.141 (28.98)	1.202 (30.53) 1.172 (29.77)	.963 (24.46)	1.062 (26.97)
27	1.004 (25.50) .994 (25.25)	.869 (22.07)	.992 (25.20)	1 1/16-18 UNEF-2A	1 1/8-18 UNEF-2A	1.327 (33.71) 1.297 (32.94)	1.327 (33.71) 1.297 (32.94)	1.089 (27.66)	1.250 (31.75)
37	1.126 (28.60) 1.116 (28.35)	.994 (25.25)	1.117 (28.37)	1 3/16-18 UNEF-2A	1 1/4-18 UNEF-2A	1.450 (36.83) 1.445 (36.70)	1.515 (38.48) 1.485 (37.72)	1.214 (30.84)	1.375 (34.92)
61	1.414 (35.92) 1.404 (35.66)	1.280 (32.51)	1.427 (36.25)	1 1/2-18 UNEF-2A	1 1/2-18 UNEF-2A	1.864 (47.35) 1.834 (46.58)	1.890 (48.01) 1.860 (47.24)	1.463 (37.16)	1.688 ±.015



PANEL CUTOUT

Panel Cutout

Shell Size	U	V	Shell Size	U	V	Shell Size	U	V
3	.538 (13.67) .534 (13.56)	.577 (14.66) .567 (14.40)	19	.973 (24.71) .969 (24.61)	1.013 (25.73) 1.003 (25.48)	61	1.471 (37.36) 1.467 (37.26)	1.514 (38.46) 1.504 (38.20)
7	.665 (16.89) .661 (16.79)	.701 (17.81) .961 (24.41)	27	1.099 (27.91) 1.095 (27.81)	1.138 (28.91) 1.128 (28.65)			
12	.788 (20.02) .784 (19.91)	.826 (20.98) .816 (20.73)	37	1.224 (31.09) 1.220 (30.99)	1.263 (32.08) 1.253 (31.83)			

D

Backshells and Accessories

Selection guide

D

Dimensions in Inches (millimeters) are subject to change without notice.

Straight Strain Relief

AS85049/118

Product Series and Basic Part Number	Dash No. *Table I*		Finish *Table II*
M85049/118	S	08	W

S *= Detented Self-Locking*
N *= Non-Detented Self-Locking*
Use Dash (–) for Non-Self-Locking

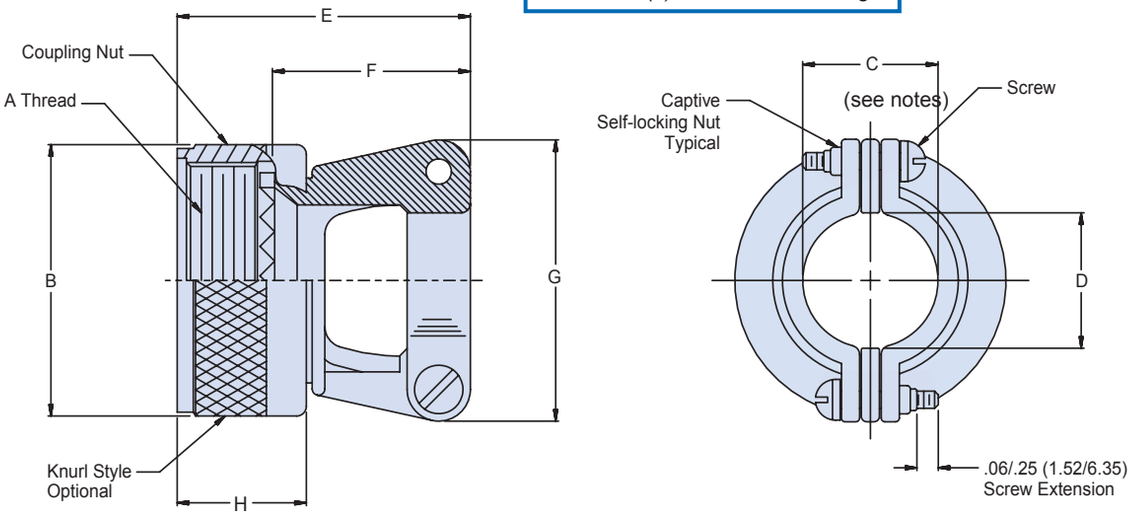


TABLE I: Dash Number, Shell Size, Thread and Dimensions

Dash No.	Screw Size	Shell Size	A Thread Class 2B	B Dia Max	C Dim ± .031 (0.8)	D Min	E Max Length	F Dim	G Dim Max	H Dim Max
03	4-40	3	9/16-24 UNEF	.95 (24.1)	.219 (5.6)	.22 (5.6)	1.14 (29.0)	.77 (19.6) .51 (13.0)	.88 (22.4)	.710 (18.00
12	4-40	7	3/4-20 UNEF	1.14 (29.0)	.344 (8.7)	.35 (8.9)	1.38 (35.1)	1.01 (25.7) .76 (19.3)	1.12 (28.4)	.710 (18.00
14	4-40	12	7/8-20 UNEF	1.26 (32.0)	.460 (11.7)	.47 (11.9)	1.38 (35.1)	1.01 (25.7) .76 (19.3)	1.19 (30.3)	.710 (18.00
16	4-40	19	1-20 UNEF	1.39 (35.3)	.545 (13.8)	.55 (14.0)	1.50 (38.1)	1.13 (28.7) .88 (22.4)	1.44 (36.6)	.710 (18.00
18	6-32	27	1 1/16-18 UNEF	1.51 (38.4)	.615 (15.6)	.62 (15.7)	1.75 (44.5)	1.38 (35.1) 1.13 (28.7)	1.56 (39.6)	.710 (18.00
20	6-32	37	1 3/16-18 UNEF	1.64 (41.7)	.698 (17.7)	.70 (17.8)	1.88 (47.8)	1.51 (38.4) 1.25 (31.8)	1.69 (42.9)	.710 (18.00
61	8-32	61	1 1/2-18 UNEF	1.95 (49.5)	.850 (21.6)	.85 (21.6)	2.13 (54.1)	1.76 (44.7) 1.51 (38.5)	1.88 (47.8)	.710 (18.0)

TABLE II: Material and Finish

Sym.	Material	Finish
A	Aluminum Alloy	Black Anodize
N		Electroless Nickel
W		Cadmium, Olive Drab
X		Nickel Fluorocarbon Polymer
Z		Zinc Nickel

NOTES

1. Glenair Series 600 Backshell Assembly Tools are recommended for assembly/installation.
2. Cable entry is measured with saddle bars closed and bottomed on clamp ears.
3. Material/Finish:
   Clamp body, coupling nut, saddles - Al alloy or 300 Series SST/See Table II.
   Clamp screws and lock nuts - CRES/Passivated, Silver plate optional.
   Anti-rotation device - Corrosion resistant material

90° Strain Relief

AS85049/120

Product Series and Basic Part Number	Dash No. *Table I*		Finish *Table II*
M85049/120	S	08	W

S *= Detented Self-Locking*
N *= Non-Detented Self-Locking*
Use Dash (–) for Non-Self-Locking

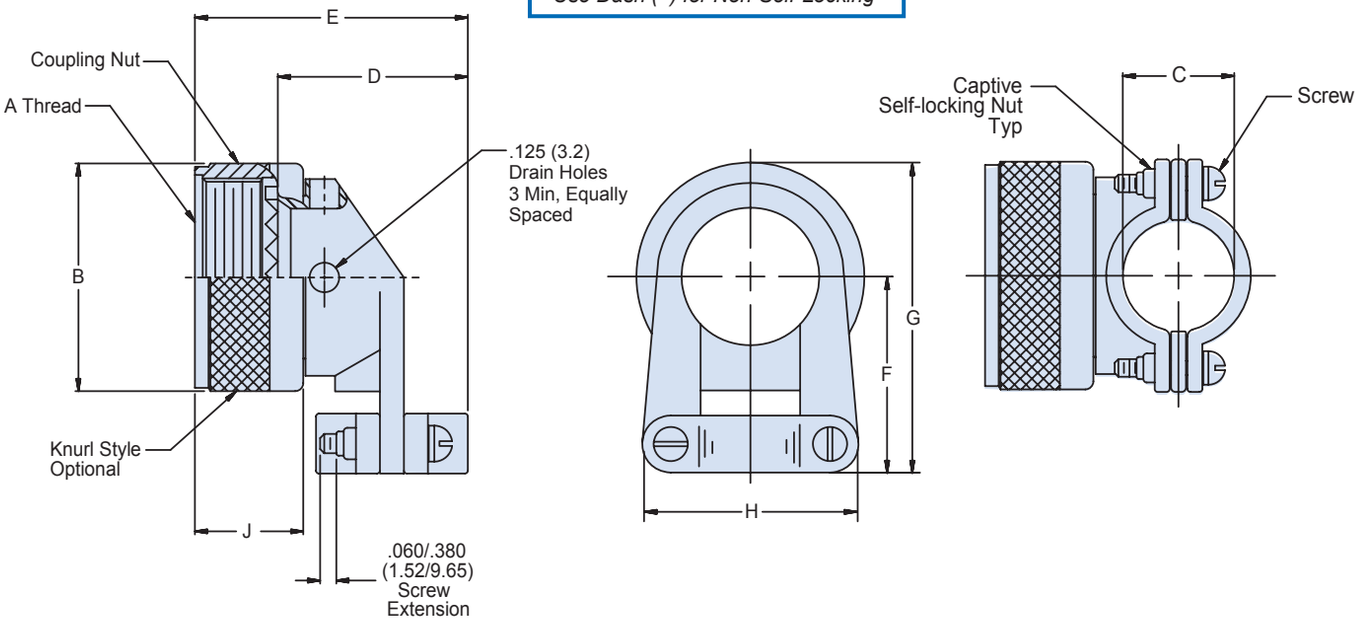


TABLE I: Dash Number, Shell Size, Thread and Dimensions

Dash No.	Screw Size	Shell Size	A Thread Class 2B	B Dia Max	C Dim ± .031 (0.8)	D Max	E Max Length	F Dim Max	G Dim Max	H Dim Max	J Dim Max
03	4-40	3	9/16-24 UNEF	.95 (24.1)	.219 (5.6)	.93 (23.6)	1.29 (32.8)	.84 (21.3)	1.32 (33.5)	.88 (22.4)	.710 (18.0)
12	4-40	7	3/4-20 UNEF	1.14 (29.0)	.344 (8.7)	1.21 (30.7)	1.57 (39.9)	.93 (23.6)	1.50 (38.1)	1.12 (28.4)	.710 (18.0)
14	4-40	12	7/8-20 UNEF	1.26 (32.0)	.460 (11.7)	1.27 (32.3)	1.63 (41.4)	1.00 (25.4)	1.62 (41.4)	1.19 (30.2)	.710 (18.0)
16	4-40	19	1-20 UNEF	1.39 (35.3)	.545 (13.8)	1.42 (36.1)	1.78 (45.2)	1.06 (26.9)	1.75 (44.5)	1.44 (36.6)	.710 (18.0)
18	6-32	27	1 1/16-18 UNEF	1.51 (38.4)	.615 (15.6)	1.53 (38.9)	1.89 (48.0)	1.23 (31.2)	1.99 (50.5)	1.56 (39.6)	.710 (18.0)
20	6-32	37	1 3/16-18 UNEF	1.64 (41.7)	.698 (17.7)	1.65 (41.9)	2.01 (51.1)	1.30 (33.0)	2.07 (52.6)	1.69 (42.9)	.710 (18.0)
61	8-32	61	1 1/2-18 UNEF	1.95 (49.5)	.850 (21.6)	1.90 (48.3)	2.26 (57.4)	1.45 (36.8)	2.43 (61.7)	1.88 (47.8)	.710 (18.0)

TABLE II: Material and Finish

Sym.	Material	Finish
A	Aluminum Alloy	Black Anodize
N		Electroless Nickel
W		Cadmium, Olive Drab
X		Nickel Fluorocarbon Polymer
Z		Zinc Nickel

NOTES

1. Glenair Series 600 Backshell Assembly Tools are recommended for assembly and installation.
2. Cable entry is measured with saddle bars closed and bottomed on clamp ears.
3. Material/Finish:
   Clamp body, coupling nut, saddles - Al alloy or 300 Series SST/See Table II.
   Clamp screws and lock nuts - CRES/Passivated, Silver plate optional.
   Anti-rotation device - Corrosion resistant material

Straight Strain Relief

AS85049/52

Basic Part Number — **M85049/52**

Dash No. — **S** | **10** | **W**

FOR NEW DESIGN USE AS85049/118

S = Self-Locking
-1 = Non-Self-Locking
N = *Non-Detented*

Material and Finish Designator
A = Aluminum, Black Anodize
N = Aluminum, Electroless Nickel
S = Stainless Steel, Passivate
W = Aluminum, 1000 Hr. Cadmium O.D. over Electroless Nickel

Superseded Part Number

MS3417-10 A

- Basic Part No. (Non-Self-Locking)
- Dash No.
- Metal and Finish Designator
  - A = Aluminum 1000 Hour Cadmium Olive Drab over Electroless Nickel
  - C = Aluminum, Cadmium Olive Drab
  - G = Aluminim Black Anodize
  - N = Aluminum, Electroless Nickel

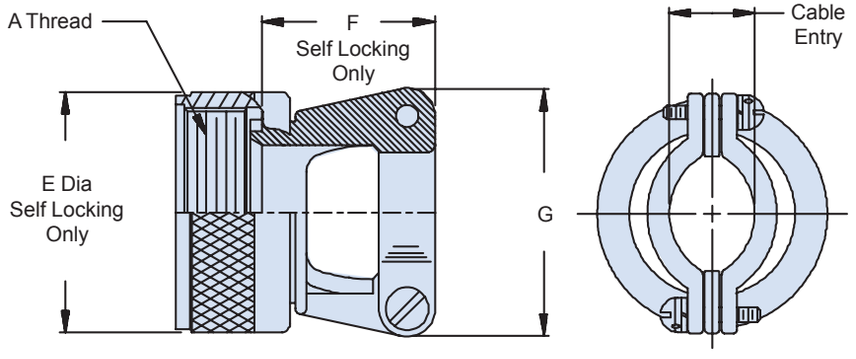


TABLE I: Shell Size, Cable Entry and Backshell Dimensions

Dash No.	Shell Size	A Thread Class 2B	Ø E Max Self-Locking		F Max Self-Locking		G Max		Cable Entry Min		Cable Entry Max	
03*	3	.562 - 24 UNEF	-	-	-	-	.782	(19.9)	.125	(3.2)	.204	(5.2)
12	7	.750 - 20 UNEF	1.135	(28.8)	.98	(24.9)	1.003	(24.6)	.291	(7.4)	.416	(10.6)
14	12	.875 - 20 UNEF	1.260	(32.0)	.98	(24.9)	1.061	(25.5)	.351	(8.9)	.476	(12.1)
16	19	1.000 - 20 UNEF	1.385	(35.2)	1.10	(27.9)	1.234	(26.9)	.501	(12.7)	.626	(15.9)
18	27	1.062 - 18 UNEF	1.510	(38.4)	1.35	(34.3)	1.466	(35.4)	.518	(13.2)	.706	(17.9)
20	37	1.188 - 18 UNEF	1.635	(41.5)	1.98	(50.3)	1.572	(37.2)	581	(14.8)	.831	(21.1)
61*	61	1.500 - 18 UNEF	-	-	-	-	1.775	(45.1)	.706	(17.9)	1.081	(27.5)

* Not Available in Self Locking

NOTES

1. Cable Entry is defined as the accommodation entry for the wire bundle or cable.
2. Dimensions are not intended for inspection criteria.
3. For complete dimensions, see the applicable Military Specification.

90° Strain Relief

AS85049/51

Basic Part Number | **Dash No.**

M85049/51 **S** **10** **W**

FOR NEW DESIGN USE AS85049/120

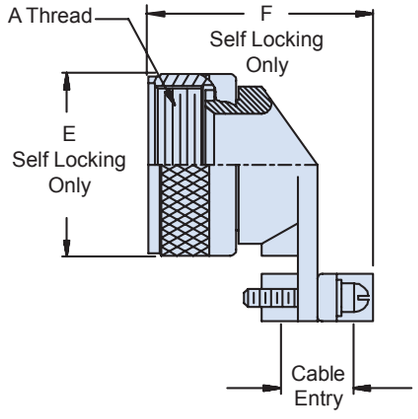
S = Self-Locking
-1 = Non-Self-Locking
N = *Non-Detented*

Material and Finish Designator
A = Aluminum, Black Anodize
N = Aluminum, Electroless Nickel
S = Stainless Steel, Passivate
W = Aluminum, 1000 Hr. Cadmium O.D. over Electroless Nickel

Superseded Part Number

MS3418-10 C

- Basic Part No. (Non-Self-Locking)
- Dash No.
- Metal and Finish Designator
  - A = Aluminum 1000 Hour Cadmium Olive Drab over Electroless Nickel
  - C = Aluminum, Cadmium Olive Drab
  - G = Aluminim Black Anodize
  - N = Aluminum, Electroless Nickel



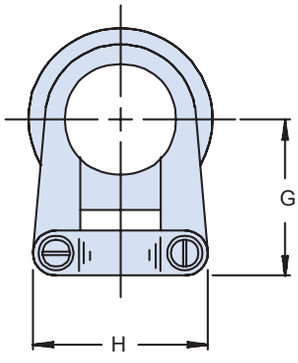


TABLE I: Shell Size, Cable Entry and Backshell Dimensions

Dash No.	Shell Size	A Thread Class 2B	Ø E Max Self-Locking		F Max Self-Locking		G ±.062	G (1.6)	H Max	H	Cable Entry Min	Cable Entry Min	Cable Entry Max	Cable Entry Max
3*	3	.562 - 24 UNEF	-	-	-	-	.777	(19.7)	.782	(19.9)	.125	(3.2)	.204	(5.2)
12	7	.750 - 20 UNEF	1.135	(28.8)	1.532	(38.9)	.867	(22.0)	.968	(24.6)	.291	(7.4)	.416	(10.6)
14	12	.875 - 20 UNEF	1.260	(32.0)	1.592	(40.4)	.930	(23.6)	1.003	(25.5)	.351	(8.9)	.476	(12.1)
16	19	1.000 - 20 UNEF	1.385	(35.2)	1.741	(44.2)	.994	(25.2)	1.061	(26.9)	.501	(12.7)	.626	(15.9)
18	27	1.062 - 18 UNEF	1.510	(38.4)	1.853	(47.1)	1.171	(29.7)	1.394	(35.4)	.518	(13.2)	.706	(17.9)
20	37	1.188 - 18 UNEF	1.635	(41.5)	1.978	(50.2)	1.234	(31.2)	1.466	(37.2)	581	(14.8)	.831	(21.1)
61*	61	1.500 - 18 UNEF	-	-	-	-	1.388	(35.3)	1.775	(45.1)	.706	(17.9)	1.081	(27.5)

* Not Available in Self Locking

NOTES

1. Cable Entry is defined as the accommodation entry for the wire bundle or cable.
2. Dimensions are not intended for inspection criteria.
3. For complete dimensions, see the applicable Military Specification.

Straight Shrink Boot Adapter

AS85049/60-1

Basic Part Number: M85049/60-1

Shell Size: W 22

Finish
- *A = Black Anodize*
- *W = 1000 Hr. Cadmium Olive Drab*
- *X = Nickel Fluorocarbon Polymer*
- *Y = Pure Dense Electrodeposited Aluminum*
- *Z = Zinc Nickel, Black*

Superseded Part Number

Basic Part Number: MS3158 - 22 C

Shell Size

Finish
- *A = 1,000 Hr. Cadmium Olive Drab*
- *C = Cadmium Olive Drab*
- *N = Electroless Nickel*

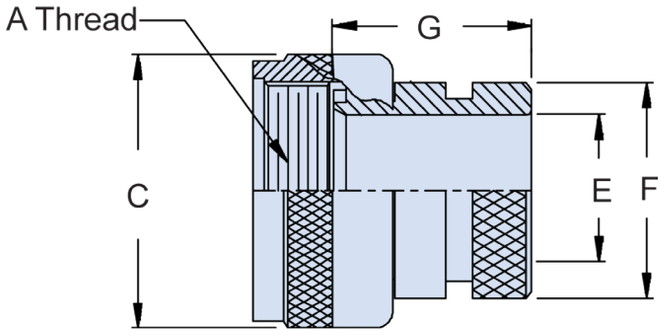


TABLE I: Shell Size, Thread and Dimensions

Dash No.	Shell Size	A Thread Class 2B	C Dia Max +.000 (0.0) -.045 (1.14)	E Min Dia	F Dia +.000 (0.0) -.020 (0.5)	G Max
3	3	.562 - 24 UNEF	.670 (17.0)	.250 (6.4)	.533 (13.5)	.832 (21.1)
12	7	.750 - 20 UNEF	.860 (21.8)	.491 (12.5)	.774 (19.7)	.832 (21.1)
14	12	.875 - 20 UNEF	.980 (24.9)	.565 (14.4)	.838 (21.3)	.832 (21.1)
16	19	1.000 - 20 UNEF	1.110 (28.2)	.690 (17.5)	.963 (24.5)	.832 (21.1)
18	27	1.062 - 18 UNEF	1.220 (31.0)	.769 (19.5)	1.042 (26.5)	.832 (21.1)
20	37	1.188 - 18 UNEF	1.350 (34.3)	.894 (22.7)	1.217 (30.9)	.832 (21.1)
61	61	1.500 - 18 UNEF	1.650 (41.9)	1.174 (29.8)	1.529 (38.8)	.832 (21.1)

NOTE

1. For complete dimensions see the applicable Military Specification.

Straight Shrink Boot Adapter

AS85049/60-2G

Basic Part Number	Shell Size	
M85049/60-2G	22	W

Finish
A = Black Anodize
W = 1000 Hr. Cadmium Olive Drab
X = Nickel Fluorocarbon Polymer
Y = Pure Dense Electrodeposited Aluminum
Z = Zinc Nickel, Black

Superseded Part Number

Basic Part Number	Shell Size	Style	
MS3416	- 22	G	C

Finish
C = Cadmium Olive Drab over Electroless Nickel
N = Electroless Nickel

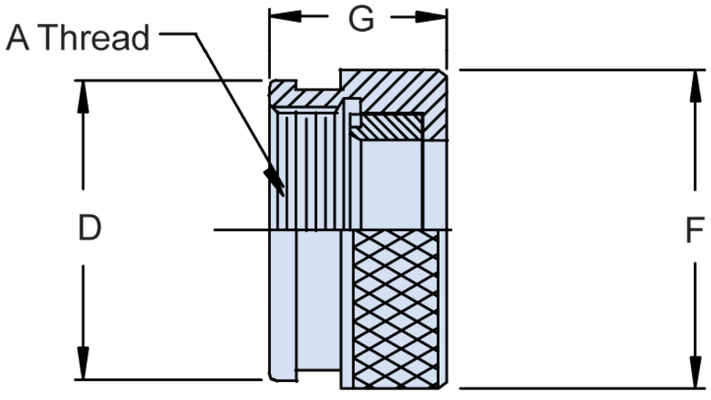


TABLE I: Shell Size, Thread and Dimensions

Dash No.	Shell Size	A Thread Class 2B	D Dia +.000 (0.0) -.020 (0.5)	F Dia +.000 (0.0) -.045 (1.1)	G Max
3	3	.562 - 24 UNEF	.709 (18.0)	.750 (19.1)	.540 (13.7)
12	7	.750 - 20 UNEF	.898 (22.8)	.938 (23.8)	.540 (13.7)
14	12	.875 - 20 UNEF	1.024 (26.0)	1.063 (27.0)	.540 (13.7)
16	19	1.000 - 20 UNEF	1.152 (29.3)	1.238 (31.4)	.540 (13.7)
18	27	1.062 - 18 UNEF	1.243 (31.6)	1.310 (33.3)	.540 (13.7)
20	37	1.188 - 18 UNEF	1.370 (34.8)	1.436 (36.5)	.540 (13.7)
61	61	1.500 - 18 UNEF	1.653 (42.0)	1.748 (44.4)	.540 (13.7)

NOTE

1. For complete dimensions see the applicable Military Specification.

Straight Crimp Ring Backshell and Crimp Ring

AS85049/26-1 and MS3419

Basic Part Number
M85049/26-1 = Adapter Only
M85049/26-2 = Crimp Ring Only
M85049/26-3 = Adapter with Crimp Ring
(See Page B-52 for Crimp Ring)

Shell Size
(Table II)

M85049/26-1 - 12 W

Finish
N = Electroless Nickel
W = 1,000 Hr. Cadmium Olive Drab over Electroless Nickel
X = Aluminum, Nickel Fluorocarbon Polymer
Z = Aluminum, Zinc-Nickel, Black

Superseded Part Number

MS3419-21 C
(Basic Part No. / Shell Size)

Finish
(Material is Aluminum Only)
A = Electroless Nickel
C = 500 Hr. Cadmium Olive Drab over Electroless Nickel

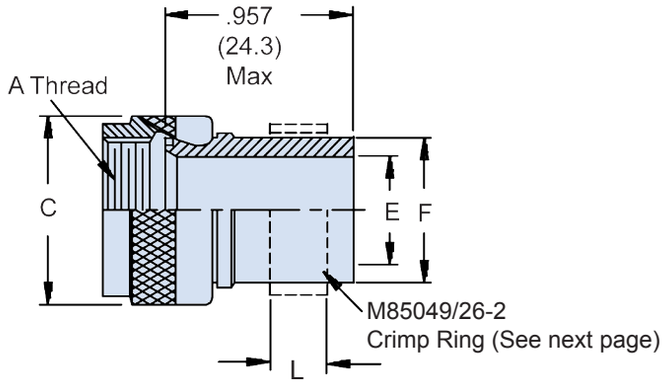


TABLE I: Adapter Shell Size,Thread, and Dimensions

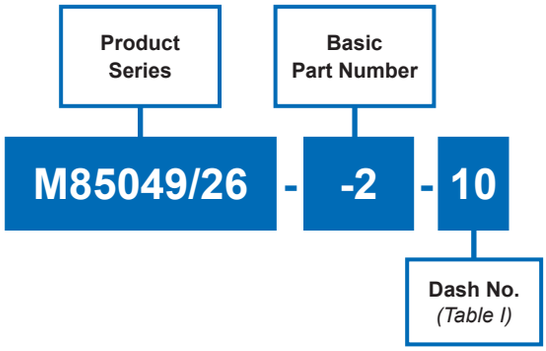
Dash No.	Shell Size	A Thread Class 2B	C Dia Max	E Dia	F Dia
3	3	.562 - 24 UNEF	.670 (17.0)	.250 (6.4)	.337 (8.6)
12	7	.750 - 20 UNEF	.860 (21.8)	.420 (10.7)	.500 (12.7)
14	12	.875 - 20 UNEF	.980 (24.9)	.540 (13.7)	.620 (15.7)
16	19	1.000 - 20 UNEF	1.110 (28.2)	.670 (17.0)	.750 (19.1)
18	27	1.062 - 18 UNEF	1.220 (31.0)	.789 (20.0)	.880 (22.4)
20	37	1.188 - 18 UNEF	1.350 (34.3)	.914 (23.2)	1.000 (25.4)
61	61	1.500 - 18 UNEF	1.650 (41.9)	1.210 (30.7)	1.359 (34.5)

NOTES

1. For complete dimensions see the applicable Military Specification.
2. Metric dimensions (mm) are in parentheses.

Backshell Crimp Ring

AS85049/26-2



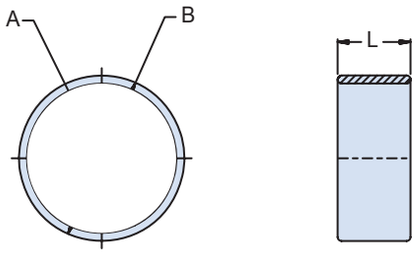


TABLE I: Shell Size, Thread, Cable Entry and Dimensions

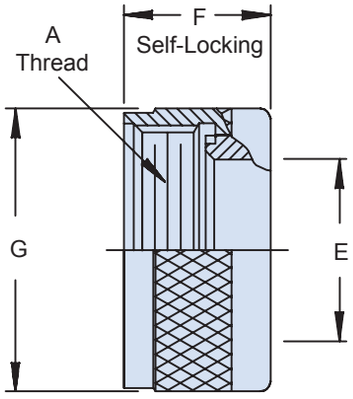
Dash No.	Shell Size	Color Code	A Dia Min	A Dia Max	B Dia Min	B Dia Max	L Dim ± ±.020 (0.5)	Installing Die Cat. No. (See Note 2)
8	3	GREEN	.400 (10.2)	.410 (10.4)	.448 (11.4)	.458 (11.6)	.250 (6.4)	GS405
12	7	RED	.585 (14.9)	.595 (15.1)	.660 (16.8)	.680 (17.3)	.440 (11.2)	GS590
14	12	BLUE	.705 (17.9)	.715 (18.2)	.780 (19.8)	.800 (20.3)	.440 (11.2)	GS710
16	19	GREY	.835 (21.2)	.845 (21.5)	.910 (23.1)	.930 (23.6)	.440 (11.2)	GS840
18	27	BROWN	1.005 (25.5)	1.015 (25.8)	1.080 (27.4)	1.100 (27.9)	.440 (11.2)	GS1010
20	37	GREEN	1.125 (28.6)	1.135 (28.8)	1.200 (30.5)	1.220 (31.0)	.440 (11.2)	GS1130
61	61	PURPLE	1.435 (36.4)	1.445 (36.7)	1.510 (38.4)	1.530 (38.9)	.440 (11.2)	GS1440

NOTES

1. Assembly identified with manufacturer's name and part number, space permitting.
2. Crimp tool shall be the Thomas and Betts Installing Head catalog number 13640 or equivalent (see Table I).
3. The installing dies (Thomas and Betts Cat. No.--See Table I) shall be used with the Thomas and Betts Installing head Catalog Number 13640 or an equivalent tool.
4. Material/Finish: Copper/Tin Plate.
5. Metric dimensions (mm) are in parentheses.

E-Nut (Self-Locking and Non-Self-Locking)

AS85049/31, MS3416 and MIL-DTL-85723/15N



Basic Part Number

M85049/31 | **S** | **22** | **W**

Finish
- ***A*** = *Anodize, Black*
- ***N*** = *Electroless Nickel*
- ***W*** = *1,000 Hour Cadmium Olive Drab over Electroless Nickel*
- ***X*** = *Nickel Fluorocarbon Polymer*
- ***Y*** = *Pure Dense Electrodeposited Aluminum*
- ***Z*** = *Zinc-Nickel, Black*

- ***S*** = *Self-Locking*
- ***N*** = *Non-Detented*

Use Dash for Non-Self-Locking

Shell Size

Superseded Part Number

M83723/15N-10 A

- Basic Part No. (Non-Self-Locking Only)
- Dash No.
- Finish Designator
  - A = Non-Conductive, Black Anodize
  - R = Conductive, Electroless Nickel

Superseded Part Number

MS3416 -10-E A

- Basic Part No. (Non-Self-Locking Only)
- Dash No.
- Style
- Metal and Finish Designator
  - A = Aluminum 500 Hour Cad. Olive Drab Over Electroless Nickel
  - C = Aluminum, Cadmium Olive Drab
  - G = Aluminum, Black Anodize
  - N = Aluminum, Electroless Nickel

TABLE I: Shell Size, Thread and Dimensions

Shell Size	A Thread Class 2B	Ø E Max		F Max		Ø G Max	
3	.562 - 24 UNEF	.270	(6.9)	--		--	
7	.750 - 20 UNEF	.511	(13.0)	.710	(18.0)	1.135	(28.8)
12	.875 - 20 UNEF	.585	(14.9)	.710	(18.0)	1.260	(32.0)
19	1.000 - 20 UNEF	.710	(18.0)	.710	(18.0)	1.385	(35.2)
27	1.062 - 18 UNEF	.789	(20.0)	.710	(18.0)	1.510	(38.4)
37	1.188 - 18 UNEF	.914	(23.2)	.710	(18.0)	1.635	(41.5)
61	1.500 - 18 UNEF	1.194	(30.3)	--		--	

NOTES

1. For complete dimensions see the applicable Military Specification.
2. Metric dimensions (mm) are in parentheses.

90° Environmental Backshell

AS85049/9 and MS3188B

Basic Part Number | **Dash Number** *(Table II)*

M85049/9 - 21 N

Finish / Material

B = *Black Cadmium / Stainless Steel*
N = *Electroless Nickel / Aluminum*
S = *Passivated / Stainless Steel*
W = *1,000 Hr. Cadmium Olive Drab over Electroless Nickel / Aluminum*
X = *Nickel Fluorocarbon Polymer*
Y = *Pure Dense Electrodeposited Aluminum*
Z = *Zinc Nickel*
XS = *Nickel Fluorocarbon Polymer / Stainless Steel*
YS = *Pure Dense Electrodeposited Aluminum / Stainless Steel*
ZS = *Zinc Nickel, Black / Stainless Steel*

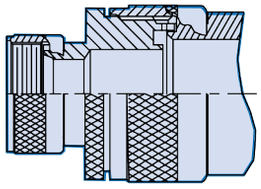
Superseded Part Number

MS3188B 21 N

Basic Part No. | Dash No.

Finish
(Material is Aluminum Only)

A = Cadmium Olive Drab over Nickel
C = Cadmium Olive Drab
N = Electroless Nickel



STYLE 2

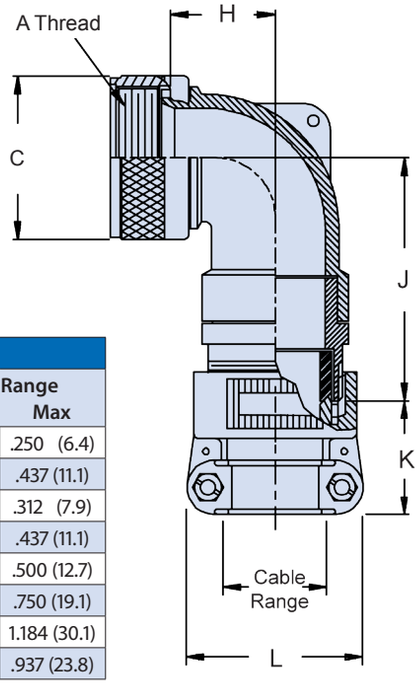


TABLE II: Dash Number and Cable Range

Dash No.	Shell Size	A Thread Ref	C Dia Max	H Max	J Max	K Ref.	L Max	Cable Range Min	Cable Range Max
1	03	9/16-24 UNEF	.98 (24.9)	.761 (19.3)	1.862 (47.3)	1.027 (26.1)	.957 (24.3)	.125 (3.2)	.250 (6.4)
2	03			1.511 (38.4)	1.382 (35.1)	1.027 (26.1)	1.145 (29.1)	.250 (6.4)	.437 (11.1)
6	12	7/8-20 UNEF	1.28 (32.5)	.766 (19.5)	2.002 (50.9)	1.027 (26.1)	.957 (24.3)	.125 (3.2)	.312 (7.9)
7	12			.766 (19.5)	2.002 (50.9)	1.027 (26.1)	1.145 (29.1)	.250 (6.4)	.437 (11.1)
8	12			.766 (19.5)	1.397 (35.5)	1.027 (26.1)	1.332 (33.8)	.350 (8.9)	.500 (12.7)
38	61	1-1/2-18 UNEF	1.89 (48.0)	1.291 (32.8)	2.442 (62.0)	1.059 (26.9)	1.551 (39.4)	.500 (12.7)	.750 (19.1)
39	61			1.291 (32.8)	2.087 (53.0)	1.375 (34.9)	2.113 (53.7)	.875 (22.2)	1.184 (30.1)
53	61			1.291 (32.8)	2.087 (53.0)	1.156 (29.4)	1.770 (45.0)	.625 (15.9)	.937 (23.8)

NOTES

1. For complete dimensions see the applicable Military Specification.
2. Metric dimensions (mm) are in parentheses.
3. When maximum cable entry is exceeded, Style 2 will be supplied.
4. Cable Range is defined as the accommodation range for the wire bundle or cable. Dimensions shown are not intended for inspection criteria.
5. Approximate chain lengths: Dash No. 01-12 = 5.0 (127.0); Dash No. 13-29 = 6.0 (152.4).

Straight EMI/RFI Environmental Backshell

AS85049/10 and MS3437A

Superseded Part Number

MS3437A 21 C

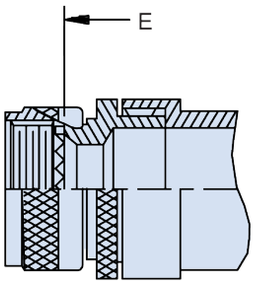
Basic Part No. | Dash No.

Finish
(Material is Aluminum Only)
A = Cadmium Olive Drab over Nickel
C = Cadmium Olive Drab
N = Electroless Nickel

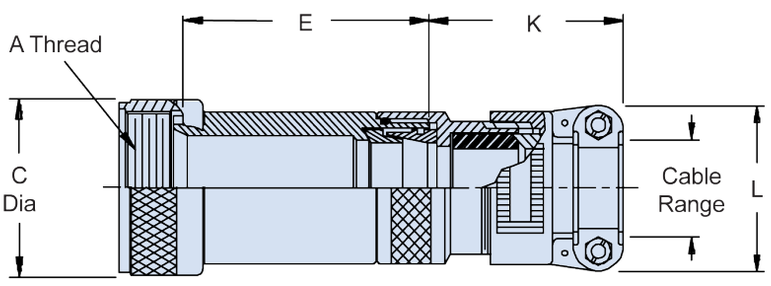
Basic Part Number | **Dash Number** *(Table II)*

M85049/10 - 21 W

Finish / Material
B *= Black Cadmium / Stainless Steel*
N *= Electroless Nickel / Aluminum*
S *= Passivated / Stainless Steel*
W *= 1,000 Hr. Cadmium Olive Drab over Electroless Nickel / Aluminum*
X *= Aluminum, Nickel Fluorocarbon Polymer*
Z *= Aluminum, Zinc-Nickel, Black*
XS *= Stainless Steel, Nickel Flurocarbon Polymer*
ZS *= Stainless Steel, Zinc-Nickel, Black*



STYLE 2



STYLE 1

TABLE I: Shell Size and Dimensions

Dash No.	Shell Size	A Thread Class 2B	C Dia Max
3	3	.562 - 24 UNEF	.67 (17.0)
12	7	.750 - 20 UNEF	.86 (21.8)
14	12	.875 - 20 UNEF	.98 (24.9)
16	19	1.000 - 20 UNEF	1.11 (28.2)
18	27	1.062 - 18 UNEF	1.22 (31.0)
20	37	1.188 - 18 UNEF	1.34 (34.0)
61	61	1.500 - 18 UNEF	1.65 (41.9)

TABLE II: Dash No., Style, Shell Size, Dimensions and Cable Range

Dash No.	Shell Size	Style	E Max	K Ref	L Max	Cable Range Min	Cable Range Max
01	3	1	2.125 (54.0)	1.544 (39.2)	.957 (24.3)	.125(3.2)	.250(6.4)
02	3	1	3.125 (79.4)	1.544 (39.2)	.957 (24.3)	.125(3.2)	.250(6.4)
03	3	2	2.875 (73.0)	1.544 (39.2)	1.145 (29.1)	.250(6.4)	.437 (11.1)
04	3	2	3.875 (98.4)	1.544 (39.2)	1.145 (29.1)	.250(6.4)	.437 (11.1)
13	12	1	2.125 (54.0)	1.544 (39.2)	1.145 (29.1)	.250(6.4)	.437 (11.1)
14	12	1	3.125 (79.4)	1.544 (39.2)	1.145 (29.1)	.250(6.4)	.437 (11.1)
15	12	2	2.875 (73.0)	1.844 (46.8)	1.332 (33.8)	.350(8.9)	.625 (15.9)
16	12	2	3.875 (98.4)	1.844 (46.8)	1.332 (33.8)	.350(8.9)	.625 (15.9)
103	61	1	3.125 (79.4)	1.916 (48.7)	1.551 (39.4)	.500 (12.7)	.750 (19.1)
104	61	1	4.125 (104.8)	1.916 (48.7)	1.551 (39.4)	.500 (12.7)	.750 (19.1)
105	61	1	3.125 (79.4)	2.000 (50.8)	1.770 (45.0)	.625 (15.9)	.937 (23.8)
106	61	1	4.125 (104.8)	2.000 (50.8)	1.770 (45.0)	.625 (15.9)	.937 (23.8)
107	61	2	3.875 (98.4)	2.230 (56.6)	2.113 (53.7)	.875 (22.2)	1.250 (31.8)
108	61	2	4.875 (123.8)	2.230 (56.6)	2.113 (53.7)	.875 (22.2)	1.250 (31.8)
109	61	2	3.875 (98.4)	2.024 (51.4)	2.363 (60.0)	1.000 (25.4)	1.375 (34.9)
110	61	2	4.875 (123.8)	2.024 (51.4)	2.363 (60.0)	1.000 (25.4)	1.375 (34.9)
111	12	1	2.125 (54.0)	1.844 (46.8)	1.332 (33.8)	.350 (8.9)	.500 (12.7)
114	12	1	2.125 (54.0)	1.544 (39.2)	.957 (24.3)	.125 (3.2)	.312 (7.9)
115	12	1	3.125 (79.4)	1.544 (39.2)	.957 (24.3)	.125 (3.2)	.312 (7.9)
138	12	1	2.125 (54.0)	1.844 (46.8)	1.332 (33.8)	.350 (8.9)	.500 (12.7)
139	12	1	3.125 (79.4)	1.844 (46.8)	1.332 (33.8)	.350 (8.9)	.500 (12.7)

NOTES

1. For complete dimensions see the applicable Military Specification.
2. Metric dimensions (mm) are in parentheses.
3. Cable Range is defined as the accommodation range for the wire bundle or cable. Dimensions shown are not intended for inspection criteria.

Straight Environmental Backshell

AS85049/11 and MS3437B

Superseded Part Number

MS3437B 21 N

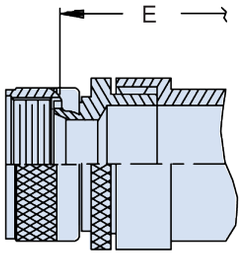
- Basic Part No.
- Dash No.
- **Finish** (Material is Aluminum Only)
  - **A** = Cadmium Olive Drab over Nickel
  - **C** = Cadmium Olive Drab
  - **N** = Electroless Nickel

Basic Part Number | **Dash Number** *(Table II)*

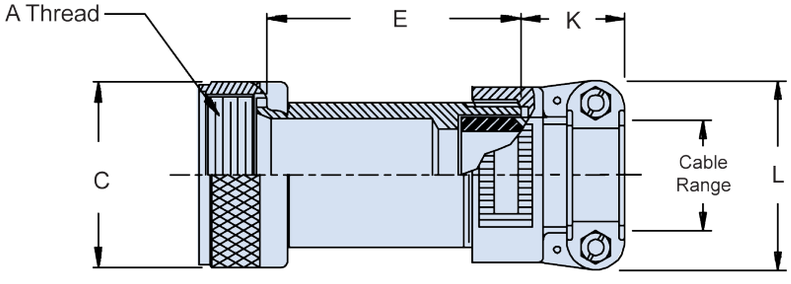
M85049/11 - 21 N

Finish / Material

- ***B*** = *Black Cadmium / Stainless Steel*
- ***N*** = *Electroless Nickel / Aluminum*
- ***S*** = *Passivated / Stainless Steel*
- ***W*** = *1,000 Hr. Cadmium Olive Drab over Electroless Nickel / Aluminum*
- ***X*** = *Aluminum, Nickel Fluorocarbon Polymer*
- ***Z*** = *Aluminum, Zinc-Nickel, Black*
- ***XS*** = *Stainless Steel, Nickel Flurocarbon Polymer*
- ***ZS*** = *Stainless Steel, Zinc-Nickel, Black*



STYLE 2



STYLE 1

TABLE I: Shell Size and Dimensions

Dash No.	Shell Size	A Thread Class 2B	C Dia Max
3	3	.562 - 24 UNEF	.67 (17.0)
12	7	.750 - 20 UNEF	.86 (21.8)
14	12	.875 - 20 UNEF	.98 (24.9)
16	19	1.000 - 20 UNEF	1.11 (28.2)
18	27	1.062 - 18 UNEF	1.22 (31.0)
20	37	1.188 - 18 UNEF	1.34 (34.0)
61	61	1.500 - 18 UNEF	1.65 (41.9)

TABLE II: Dash No., Style, Shell Size, Dimensions and Cable Range

Dash No.	Shell Size	Style	E Max	K Ref	L Max	Cable Range Min	Cable Range Max
01	3	1	2.125 (54.0)	1.027 (26.1)	.957 (24.3)	.125(3.2)	.250(6.4)
02	3	1	3.125 (79.4)	1.027 (26.1)	.957 (24.3)	.125(3.2)	.250(6.4)
03	3	2	2.875 (73.0)	1.027 (26.1)	1.145 (29.1)	.250(6.4)	.437 (11.1)
04	3	2	3.875 (98.4)	1.027 (26.1)	1.145 (29.1)	.250(6.4)	.437 (11.1)
13	12	1	2.125 (54.0)	1.027 (26.1)	1.145 (29.1)	.250(6.4)	.437 (11.1)
14	12	1	3.125 (79.4)	1.027 (26.1)	1.145 (29.1)	.250(6.4)	.437 (11.1)
15	12	2	2.875 (73.0)	1.027 (26.1)	1.332 (33.8)	.350(8.9)	.625 (15.9)
16	12	2	3.875 (98.4)	1.027 (26.1)	1.332 (33.8)	.350(8.9)	.625 (15.9)
103	61	1	3.125 (79.4)	1.059 (26.9)	1.551 (39.4)	.500 (12.7)	.750 (19.1)
104	61	1	4.125 (104.8)	1.059 (26.1)	1.551 (39.4)	.500 (12.7)	.750 (19.1)
105	61	1	3.125 (79.4)	1.156 (29.4)	1.770 (45.0)	.625 (15.9)	.937 (23.8)
106	61	1	4.125 (104.8)	1.156 (29.4)	1.770 (45.0)	.625 (15.9)	.937 (23.8)
107	61	2	3.875 (98.4)	1.375 (34.9)	2.113 (53.7)	.875 (22.2)	1.250 (31.8)
108	61	2	4.875 (123.8)	1.375 (34.9)	2.113 (53.7)	.875 (22.2)	1.250 (31.8)
109	61	2	3.875 (98.4)	1.500 (38.1)	2.363 (60.0)	1.000 (25.4)	1.375 (34.9)
110	61	2	4.875 (123.8)	1.500 (38.1)	2.363 (60.0)	1.000 (25.4)	1.375 (34.9)
111	12	1	2.125 (54.0)	1.027 (26.1)	1.332 (33.8)	.350 (8.9)	.500 (12.7)
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NOTES

1. For complete dimensions see the applicable Military Specification.
2. Metric dimensions (mm) are in parentheses.
3. Cable Range is defined as the accommodation range for the wire bundle or cable. Dimensions shown are not intended for inspection criteria.

Outgassing Properties and Requirements

Specification information
Space-grade interconnect manufacturing and test capability

Outgassing and Inspection Modification Codes

Glenair space mechanisms and related interconnect solutions are ideally designed for deployment of CubeSat and NanoSat equipment. All HDRMs, and connectors feature materials, finishes, and performance specifications that perform to NASA EEE-INST-002

Outgassing

Space flight equipment requires low-outgassing components in order to prevent degradation to optics and other sensitive instruments. Various Glenair connectors contain nonmetallic materials such as rubber, plastic, adhesives and potting compounds which can give off gasses when subjected to a vacuum or high heat. Unless the connector is specially processed, the TML and CVCM can exceed allowable limits. The space industry has adopted a standardized test procedure, ASTM E595, to evaulate outgassing properties. The MIL-DTL-38999 specification Class G also details specific TVM and CVCM values. In Glenair's 186T process, for example, connectors and connector materials are heated to 175° C at a vacuum of 5 X 10^{-6} Torr for 48 hours. Items under test are then weighed to calculate the Total Mass Loss (TML), which may not exceed 1.0% of the total initial mass. A collector plate is used to determine the Collected Volatile Condensable Material (CVCM), which may not exceed 0.1% of the total original specimen mass. Glenair is able to offer outgas processing which assures all materials comply with their respective standards.

Note on Connector Material and Finish Options

Some types of metals are prohibited for space flight. "Pure Tin, Cadmium, Zinc shall not be used as a final finish on EEE part (NASA EEE-INST-002 Instructions for EEE Parts Selection, Screening, Qualification, and Derating). NASA recommends electroless nickel or gold finish on connector shells and gold finish for contacts.

Specifying Appropriate NASA Screening

1 ***Choose a NASA EEE-INST-002 Table 2A screening level.*** This table contains three screening levels: ***Level 1*** for missions requiring the highest reliability and lowest level of risk, ***Level 2*** for low to moderate risk missions, and ***Level 3*** missions where enhanced screening and inspection is not invoked.

2 ***Choose outgassing process and/or NASA inspection requirements.*** 9 options are available for NASA outgassing, see Table I for details. Cross reference Table II for inspections completed by screening level as required by NASA standards.

3 ***Select the modification code*** from the table and add it to the part number. Example: 253-01600ME21–35PNMSA-**429.**

Table I: Outgassing per NASA Screening Levels and D38999, Class G

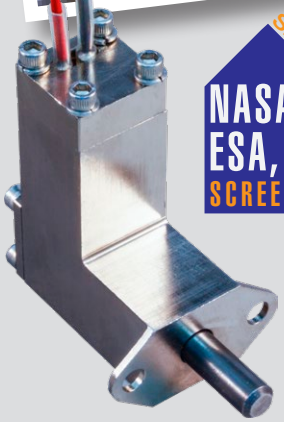
Screening Level	No Outgas Processing	48 Hour Oven Bake 175° C 100%	Thermal Vacuum* Outgassing 24 Hour 125° C 100%	Thermal Vacuum* Outgassing 48 Hour 175° C 100%	Mod Code
No Screening			●		186M (ASTM E595)
				●	186T (Class G)
3			●		429L
2	●				429
			●		429A
		●			429K
1	●				429B
			●		429C
		●			429J

*Thermal vacuum of 10^{-6} Torr.

Table II: NASA EEE-INST-02, Table 2A Screening Levels

Inspection	Level 1	Level 2	Level 3
Visual	100%	100%	100%
Mechanical	2	2	
Dielectric Withstanding Voltage	2	2	
Insulation Resistance	2	2	
Contact Engagement & Separation Force	2		
Hermeticity (Sealed Receptacles Only)	100%	100%	100%
Coupling Force	2		

Note: required inspection quantity shown. Zero acceptance of failures allowed for all quantities inspected. Inspection is not performed/required for MIL-DTL-38999, Class G



SPACE GRADE
NASA
ESA, JAXA
SCREENED

Glenair's family of space mechanisms are manufactured in certified cleanrooms. Full qualification test reports are available for every device type. NASA/ESA outgas processing and screening completed on-site. All operations are managed under a single certified quality system with unprecedented levels of performance.

But don't take it from us... take it from NASA

File Message Insert Options Format Text Review

Send To... Chris Toomey; Cc... Bcc... Subject: Glenair Supplier Audit Appreciation

December 5, 2016

Good afternoon Mr. Christopher J. Toomey…and to the Glenair Family

On behalf of the NASA Launch Services Program (LSP) and the Safety and Mission Assurance Division (SMA), I would like to express sincere appreciation for the hospitality afforded our NASA team… last week. It is obvious that your company takes pride and recognizes the value in meeting and even exceeding the intents of the Aerospace Standard AS9100. We came away with a positive sense in the partnership… . You have a remarkable campus facility and a remarkable employee team there in Glendale, and I am sure, throughout your vast network of offices and facilities around the world as well. The Quality leadership has done an outstanding job implementing a working Quality Management System around your successful business model. Thank you for recognizing the importance of this particular supplier audit to NASA… , as we seek crucial information relative to the NASA Certification… .

…I would like to express some of the other very positive comments that our team came away with regarding this audit. All of your employee team should take pride in the quality of your finished product line for your customers. To that end, here is a listing of but a few of our team's observations during the audit process:

1. Welcoming hospitality to customers
2. Informative Corporate Overview Presentation
3. Positive Employee Attitudes about the workplace
4. Informative and thorough process walk-downs
5. Informative and thorough production facility walk-downs
6. Processing area cleanliness and 5S organization
7. Timely Corrective Action and effective Preventive Action plans
8. Top Management involvement and participation in the QMS – AS9100 processes
9. Expertise of the employee team members
10. …and the ability of a randomly selected employee to express the Quality Policy and what it means to him in his position with the company

A formal compilation report is in work, and should reflect the over arching positive note, which recognizes that the audit at Glenair had no Major and no Minor findings whatsoever. Please forward to any appropriate team members who have contributed to this successful audit.

Respectfully,
Paul Cloues, NASA Quality Engineer
NASA Launch Services Program
Safety and Mission Assurance, SA-D
Analysis Planning and Test (APT) Research

Chris Toomey

E

PROVEN FLIGHT HERITAGE

SPACE-GRADE SOLUTIONS

NASA · ESA · JAXA · Commercial

Complex space-grade cable assemblies (shown: Glenair-made "Golden Umbilical")

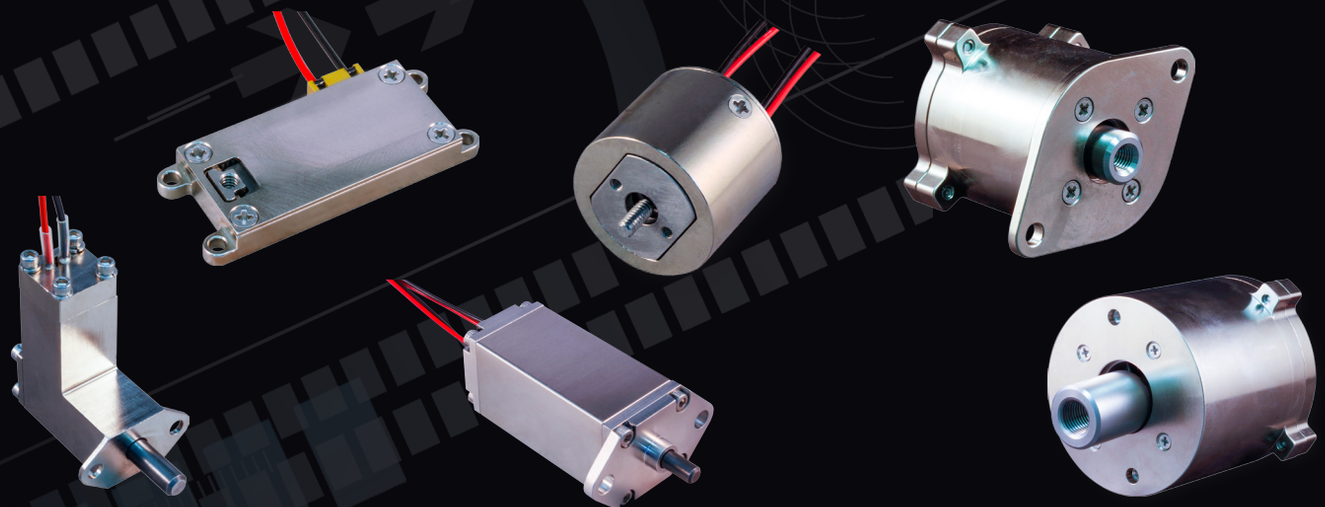
TURNKEY, SPACE-GRADE EMI/RFI WIRE HARNESS AND CABLE ASSEMBLIES

Multibranch Micro-D / Mighty Mouse cable assembly with ArmorLite™ lightweight EMI shield overbraiding

EMI/RFI shielded multibranch Micro-D connector assembly with Glenair Series 23 SuperNine® panel mount I/O connector

Repairable backshell-equipped cable assembly for a space lab application

HOLD-DOWN RELEASE MECHANISMS, PIN PULLERS AND PIN PUSHERS



Light Duty
Up to 75 lb release payload

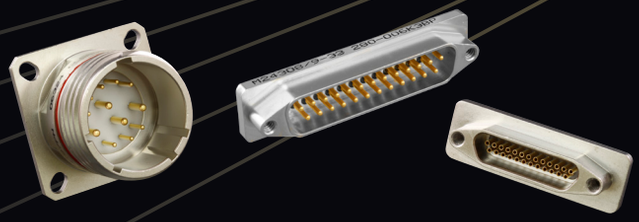
Medium Duty
Up to 1,000 lb release payload

Heavy Duty
Up to 20,000 lb release payload

SPACEWIRE CERTIFIED CABLES

Laboratory and flight variants

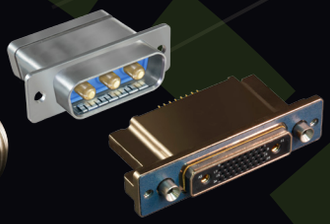
SPACE-QUALIFIED HERMETIC RECEPTACLES



Glass-to-metal and CODE RED encapsulant hermetic solutions for high-pressure / low-leakage space applications

EMI/RFI FILTER CONNECTORS

MIL-DTL-38999 type, Series 80 Mighty Mouse, and other circulars

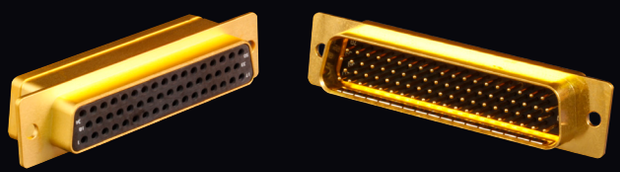


HiPer-D and Micro-Crimp filtered rectangulars

SPACE-GRADE 83513 MICRO-D AND 32139 NANO

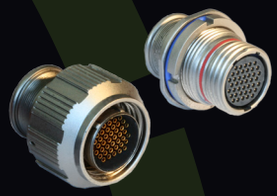
ESA and NASA screened connectors and backshells available as discrete components or wired pigtail assemblies

SERIES 28 HIPER-D M24308 INTERMATEABLE

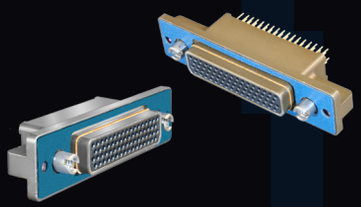


Qualified MIL-DTL-24308 Class K Space-Grade Hermetic, environmental, filter, Sav-Con® s and cordsets

LIGHTWEIGHT MIGHTY MOUSE AND SERIES 79



Small, lightweight, high-density ideally suited for space programs



A proven product, ideal for guidepin and rack-and-panel applications

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Available for every military and commercial circular and rectangular connector series

ULTRA-LIGHTWEIGHT CONDUIT AND BRAID

Factory-terminated and user-installable conduit systems

Weight-saving microfilament EMI braided shielding solutions

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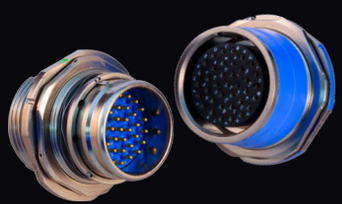

Blind mate D38999 type feedthrough with kick-off assist

Lanyard-release quick-disconnects

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High-speed, high-bandwidth space-grade solutions

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Printed in U.S.A.

CAT-155