

Step Seven: Select Wire and Cable Construction—From Convoluted Tubing to Armored and Overmolded Cable Designs



The Widest Range of Protective Materials in the Industry are Available From Glenair

Depending on your selection of input-output devices—from simple wire feed-through fittings to environmental connectors—Glenair can outfit the junction box assembly with an appropriate cable or conduit design. Tested and qualified products, including a broad range of environmental jacketing and shrink-boot materials are available for standard cable-to-connector designs. Glenair can also supply overmolded cables for harsh environments made from polymer compounds such as Viton®, Neoprene and Polyurethane.

Given the need to complete final installation of the box interconnect system on-site, many customers specify plastic and metal-core convoluted tubing as their preferred media protection material. Flexible, high-temperature convoluted tubing is an ideal material choice for interconnect systems designed around the Glenair junction box. The material provides a durable, highly-flexible enclosure for all types of wires. And Glenair is able to supply the all the end-fittings and transitions necessary to meet any installation configuration. Available materials include ETFE, FEP, PFA, PTFE and halogen-free, light weight PEEK. Glenair conduit, systems and fittings are approved to the US Navy's MIL-PRF-24758 standard. Our new FIRST Conduit Fitting System features a unique swivel design for easy installation.

Relevant Industry Standards:

IEC IP Ingress Ratings

The IP Rating indicates the measure of an enclosure's protection against dirt and water. Glenair CostSaver Composite EMI/RFI Boxes are rated to IP 67, where 6 = Total Protection Against Solid Objects, and 7 = Protection against the effects of temporary immersion in water. Glenair's Mini 147-100 Box is rated to IP64 which indicates total protection against dust, and from water sprayed from all directions.

SP-R-0022A and ASTM-E-595 Vacuum Stability

Both specifications govern the "outgassing" of non-metallic materials for use in spacecraft. Tests measure Total Mass Loss which may not exceed 1.0% of the total specimen mass. Tests for this standard also measure Collected Volatile Condensable Materials from Outgassing in a Vacuum Environment; which means they measure odor and toxicity emitted from the material. All Glenair CostSaver Composite EMI/RFI Boxes are tested and approved to these standards.

IEC 79-7 MOD (ISA-S12.16.01) Hazardous Area Explosion Protection

Electrical enclosures are certified for use in hazardous areas such as oil-rigs and tankers by standards organizations such as CENELEC. Tests measure the ability of an electrical apparatus to prevent the emission of sparks, arcs or hot surface temperatures from igniting a fire in a hazardous area. Glenair Composite EMI/RFI Boxes meet E EX e IIB T3 (increased safety) in Class I, Zones 1 and 2 hazardous locations.

UL 94: Flammability of Plastic Materials

This requirement covers flammability of plastic materials used in devices and appliances. The flammability properties of materials are measured in response to heat and flame under controlled laboratory conditions. All Glenair CostSaver Composite EMI/RFI boxes are tested and approved to this standard.

Bombardier Toxicity and Federal Railroad Administration Flame Spread, Smoke Density and Toxicity

This requirement covers material flammability and toxicity IAW with both aircraft and rail transportation requirements. Testing was completed on actual molded box samples, in the medium gray color, made from Ultem 2300-GY4001. Testing consisted of flammability IAW ASTM E 162, rate of smoke generation IAW ASTM E 662 and Bombardier SMP 800-C toxic gas generation. The Glenair composite box samples passed all tests. For additional information please request test report No. 08-002-923(B) for Bombardier toxicity, and test report No. 08-002-923(A) for surface flammability and rate of smoke generation.

Corrosion resistance and weight reduction are just part of the story for these Glenair junction box application examples

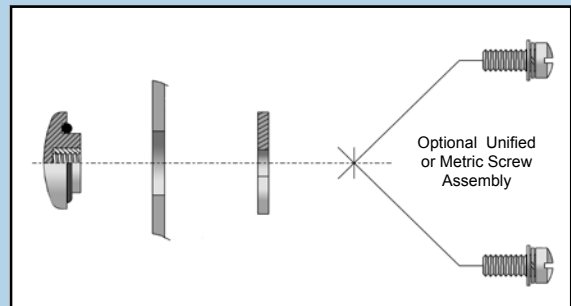
Future Soldier:

Weight reduction was the principal goal in selecting the Glenair composite box for the JEDI Warrior Program. The boxes house Lithium battery packs used to power video image and battlefield data collection systems carried by the soldier. The interconnect system and its power supply must be able to withstand the rigors of exposure to mud, dust and abusive handling. The complete solution from Glenair also included our Series 800 "Mighty Mouse" Connector and overmolded cable sets.

Ministry of Defense:

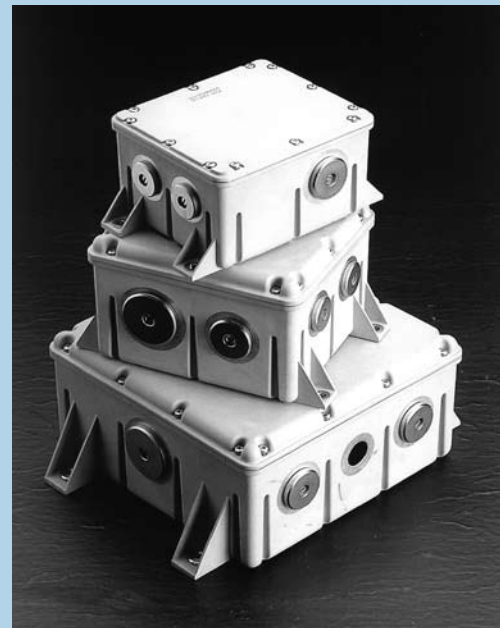
Glenair composite boxes for the UK Ministry of Defense were subjected to a rigorous testing program, including high-duration shock, EMI and salt-spray corrosion resistance. The MOD has chosen the Glenair boxes as standard replacements for existing aluminium junction boxes which became too expensive to maintain due to high-impact breakage and corrosion. The Glenair boxes now serve in submarines, missile-frigates and other shipboard applications.

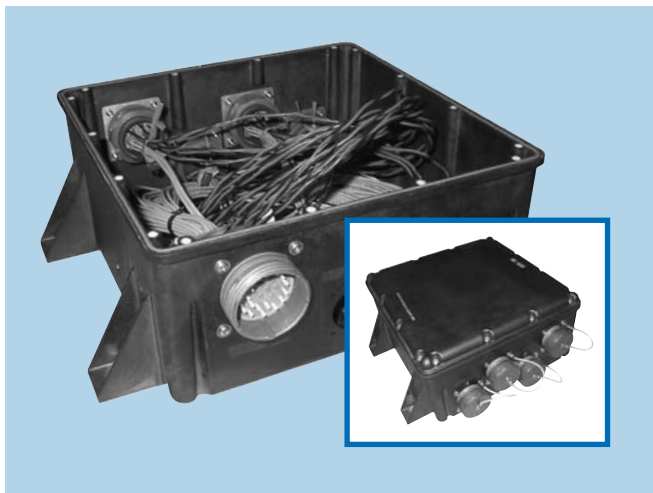
Step Eight: Select Additional Penetrations for Hole-Cap Assemblies



Junction boxes may be equipped with additional penetrations for future expansion needs, or for applications where one box design will be used in several different configurations. Glenair supplies a hole-cap assembly to seal unused penetrations against the environment. The hole-cap assemblies are rated to IP67 for particle and moisture protection.

Glenair can produce virtually any design of custom cap or lid required. Please consult the factory.





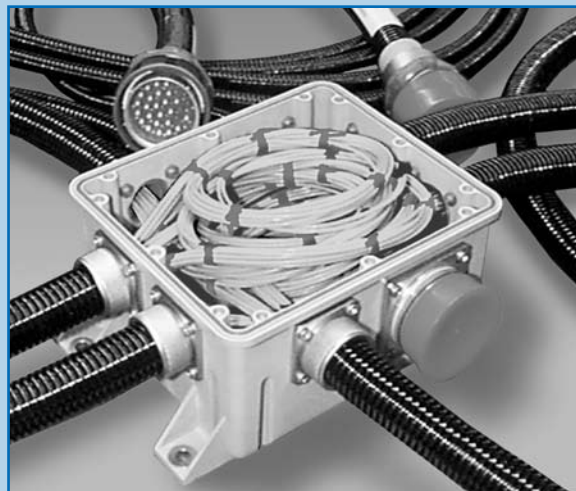
Missile-Control:

The ability to withstand extremes in shock and vibration, as well as long term corrosion protection and electromagnetic compatibility were baseline requirements for this missile control junction box. The complete system includes fiber optic connectors, termini and cabling. Interconnect systems of this type must be able to sit idle for many years, and then perform flawlessly in the blink of an eye.

Fiber-Optic Storage:

In this application, Glenair was able to provide a complete, turnkey interconnect assembly which included both the lightweight composite box, as well as the conduit and the fiber optic interconnects. The box doubles as an environmentally controlled storage area for additional lengths of fiber-optic cable. In the event a termination is damaged, both the conduit and box may be opened to access the termini and the wire-loops for easy repair.

Every Picture
Tells a Story



This One
Speaks Volumes

Glenair is in the business of solving even the most complex interconnect design problems. We know that your problem isn't solved when the connector and cable are selected. The real work starts with the packaging of the key components for actual use. Glenair is ready with junction box solutions that incorporate our complete line of interconnect products—all available in corrosion-free composite thermoplastic. At Glenair, we're ready with both the individual interconnect technologies, as well as the most innovative and effective packaging solutions available today. Now *that's* a story worth telling.

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Glenair Standard US Navy Composite Boxes

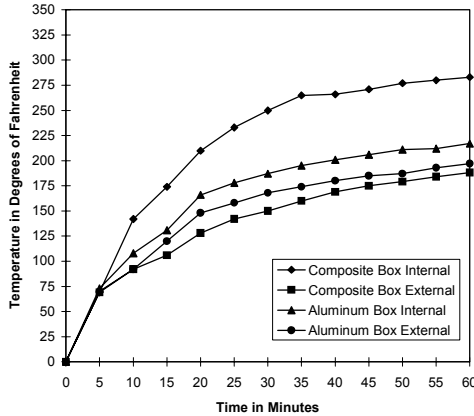
<u>Stock Code</u>	<u>Description</u>
CDNWC 655-03-001 (NAVSEA umbrella stock code for the Glenair Electrical Junction Box Series).	Junction Box, with or without terminal blocks, four sizes
	Electrical Box, 115V, 15 Amp, two sizes, single and dual receptacle
	Sound Powered Telephone Box with Glenair composite jack receptacle, three sizes, single, dual and quad

Glenair CostSaver Composite EMI/RFI Junction Boxes Electrical Performance Specifications

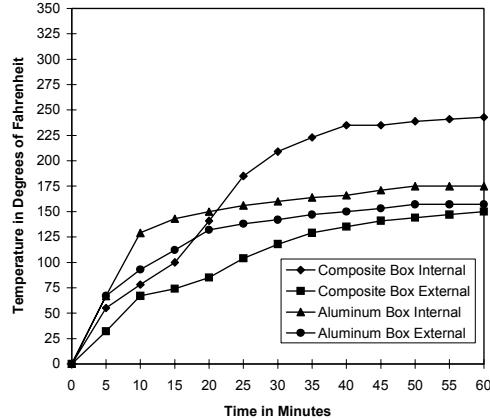


Composite
Junction
Boxes

Thermal Conductivity at 60,000 Feet Elevation

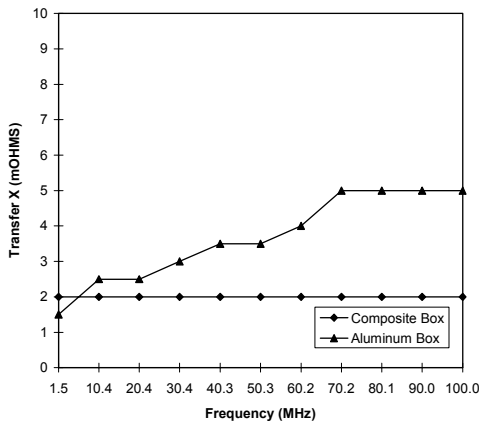


Thermal Conductivity at Sea Level

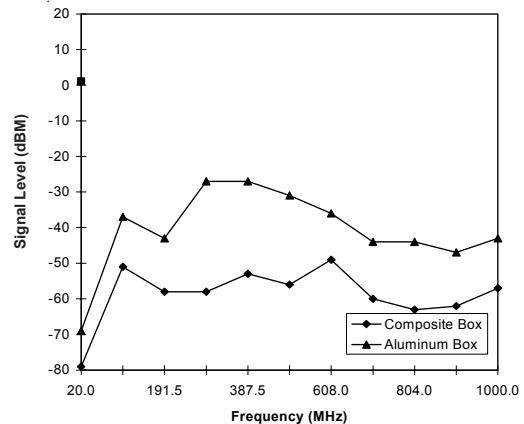


Consult factory for thermally conductive material option 10-20 w/mk

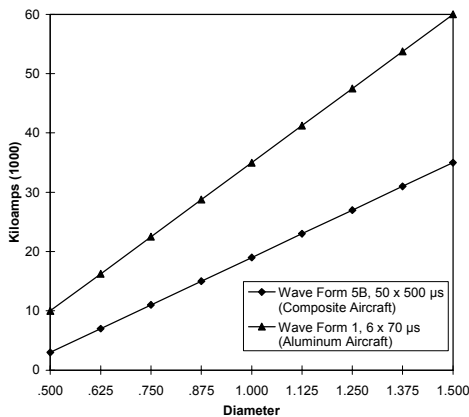
Transfer Impedance



Radiated Emissions



Indirect Lightning Strike Threshold
SAE - AE4L-87-3, Wave Forms 1 & 5B



The values shown for indirect lightning strike represent the approximate threshold of conductive composite tubular attachment components having diameters equal to those listed. For example, connector shell size is calculated in .0625 increments; shell size 10 = 10 x .0625 or .625 diameter. Cable entry diameter is another consideration. Use the smallest part diameter when evaluating thresholds. Consult factory for additional information.



Box Specification Worksheet

Glenair brings a unique strength to junction box systems: the ability to build a turnkey assembly—wired, terminated, tested and complete with all the necessary fittings and accessories. We are the only nonmetallic enclosure manufacturer in the world which can supply an integrated interconnect system of this type. And we are pleased to provide this service at small quantity and prototype levels. This worksheet summarizes the major decision points in the design and development of an interconnect box assembly.

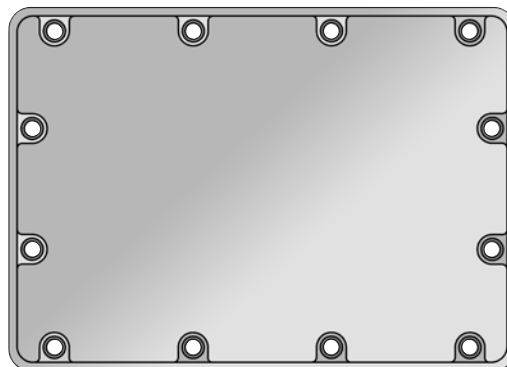
<p>Originator Contact Information</p> <p>Name: _____</p> <p>Location: _____</p> <p>Phone: _____</p> <p>Fax: _____</p> <p>E-Mail: _____</p> <p>Select Box Series Size and Type</p> <p><input type="checkbox"/> Ultra-Miniature Box (140-074)</p> <p><input type="checkbox"/> Mini Junction Box (140-100)</p> <p><input type="checkbox"/> Small Junction Box (140-101)</p> <p><input type="checkbox"/> Medium Junction Box (140-102)</p> <p><input type="checkbox"/> Large Junction Box (140-103)</p> <p><input type="checkbox"/> Jumbo Junction Box (140-107)</p> <p><input type="checkbox"/> Small Low-Profile Box (140-104)</p> <p><input type="checkbox"/> Med Low-Profile Box (140-105)</p> <p><input type="checkbox"/> Small Three-Legged Box (140-106)</p> <p><input type="checkbox"/> Octagonal Box (140-200)</p> <p><input type="checkbox"/> Twelve Port Box (140-203)</p> <p>Select Box Color</p> <p><input type="checkbox"/> Black</p> <p><input type="checkbox"/> Grey</p> <p><input type="checkbox"/> Brown</p>	<p><input type="checkbox"/> Purple</p> <p><input type="checkbox"/> Other _____</p> <p>Select Plating Type</p> <p><input type="checkbox"/> Electroless Nickel/Metallic Finish</p> <p><input type="checkbox"/> Zinc Nickel/Matte black Finish</p> <p><input type="checkbox"/> Ni-PTFE 1000 Hour Gray™</p> <p><input type="checkbox"/> No Plating</p> <p>Select Plating Coverage</p> <p><input type="checkbox"/> Internal Plating with Selectively Plated Entry Holes</p> <p><input type="checkbox"/> External Plating Only</p> <p><input type="checkbox"/> No Plating (non-conductive)</p> <p>Select Grounding Device</p> <p><input type="checkbox"/> Integrated Grounding Foot</p> <p><input type="checkbox"/> Side-Mounted Grounding Stud</p> <p><input type="checkbox"/> None</p> <p>Select Internal Mounting Plate</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p>	<p>Specify Internal Terminal Rail Mounting Plate Drilling</p> <p><input type="checkbox"/> Not Applicable</p> <p><input type="checkbox"/> Standard Drilling Per Catalog</p> <p><input type="checkbox"/> Per Customer Drawing</p> <p>Wire/Cable Construction</p> <p><input type="checkbox"/> Standard Armored/Shielded Cable</p> <p><input type="checkbox"/> Glenair Overmolded Cable</p> <p><input type="checkbox"/> Plastic Convuluted Tubing</p> <p><input type="checkbox"/> Metal-Core Conduit</p> <p><input type="checkbox"/> Not Applicable</p> <p>Supply Additional Penetrations with Hole Cap Assemblies?</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p> <p><input type="checkbox"/> Not Applicable</p> <p>Glenair to Provide Turnkey Assembly of Box Components?</p> <p><input type="checkbox"/> Yes. (Bill of Materials and/or Drawing Required)</p> <p><input type="checkbox"/> No</p> <p><input type="checkbox"/> Not Applicable</p>
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Select/Indicate Connector and Fitting Locations:

Indicate the locations of your selected connectors and fittings. You may simply describe the devices in the space provided ("Two jam-nut 15 pin D38999 Series III Connectors go on Side "A") or you may sketch the fittings and connectors in place with appropriate labels. There are no limits to the size and number of penetrations other than the physical boundaries of the box surfaces. Use the dimensional information published with each connector or feed-through series, or call our factory for assistance.

NOTE: Box Series Numbers are for reference only. Call the factory for part number assignment for custom box configurations.

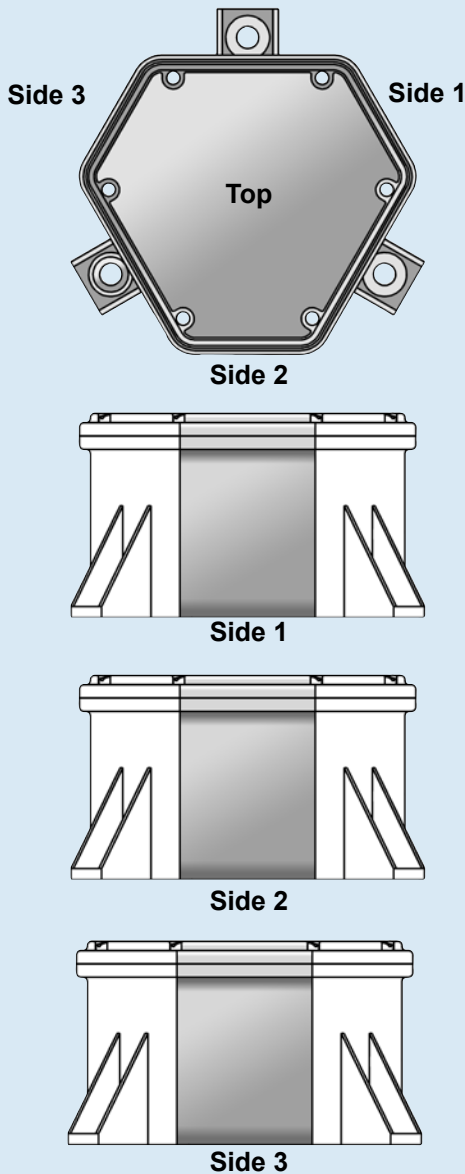
Rectangular Box Top Template



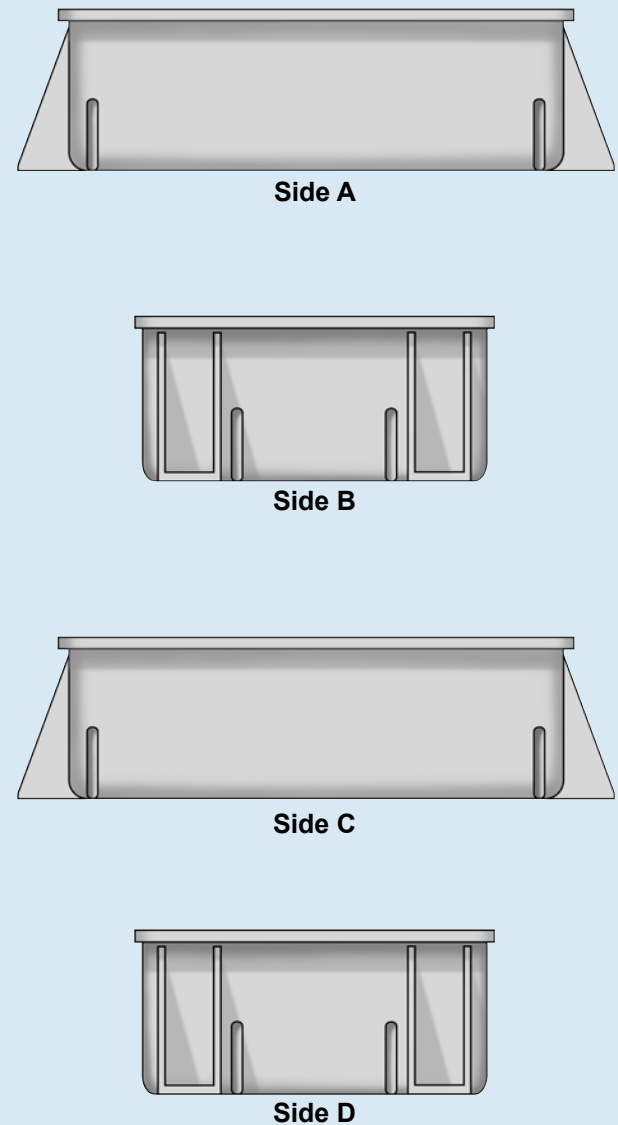
Input-Output Device Position Template

This template may be used to indicate initial positioning of connectors, feed-throughs and fittings such as ground lugs. Indicate the location of all special markings or labels including correct wording/numbering.

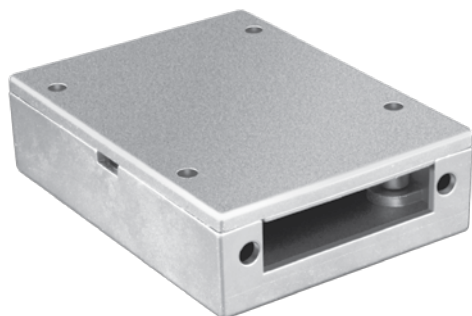
Three-Legged Junction Boxes



Rectangular Junction Boxes



The structural ribs located on the rectangular box sides are provided to increase the overall strength of the box. The ribs may be removed to accommodate additional fittings if necessary. For additional assistance in locating connectors and fittings please consult the factory. For custom fittings, such as specially designed doors or lid covers, please consult the factory. Application engineering for customer specified box assemblies is provided free upon request.



**Ultra-Miniature
Series 140-074
CostSaver Composite
Junction Box**

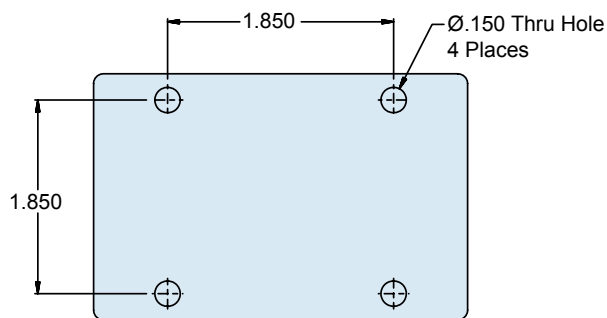
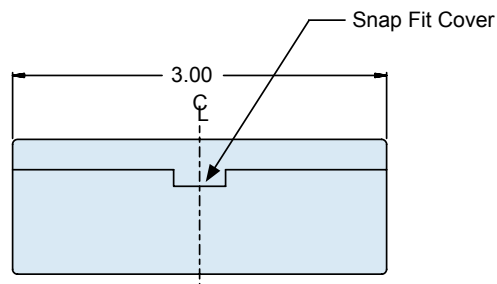
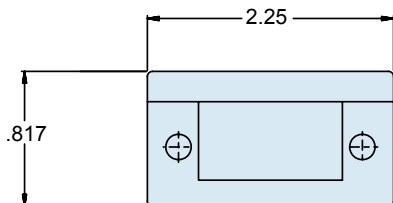
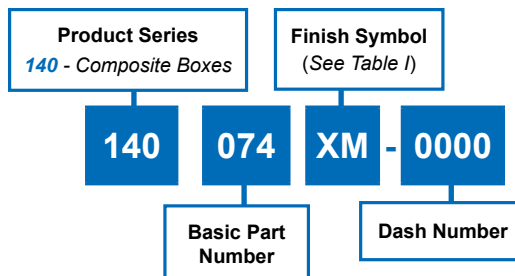


TABLE I

Symbol	Finish Description
XM	Electroless Nickel
XO	No Plating (Non-Conductive Finish)
XMT	2000 Hour Corrosion Resistant Ni-PTFE, Nickel-Fluorocarbon Polymer. 1000 Hour Grey™
XMC	Electroless Nickel per Lockheed Martin Specification FPS-3084

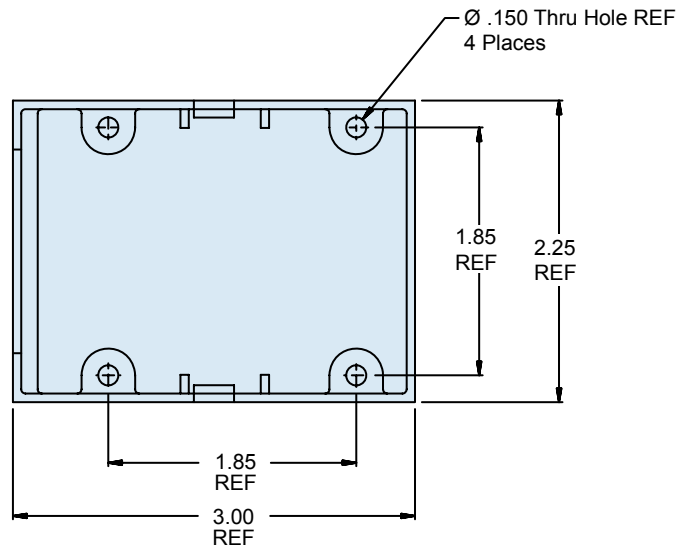
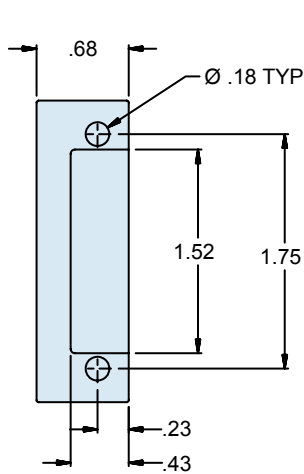
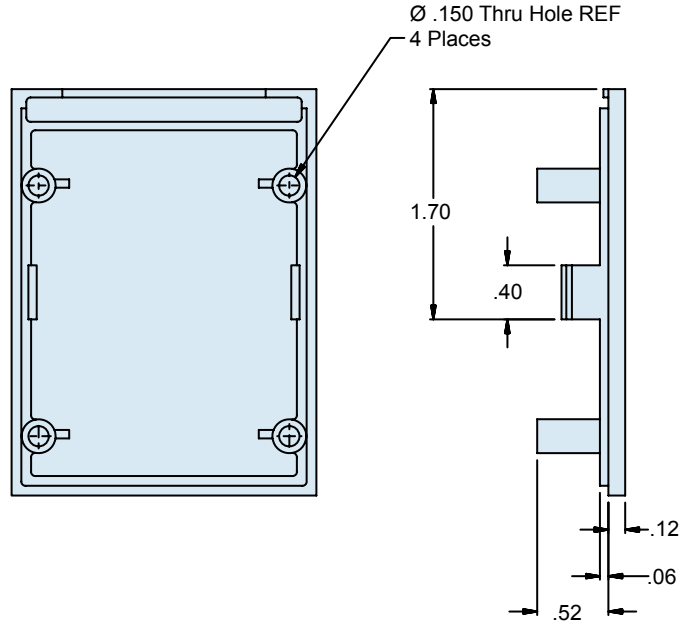
NOTES

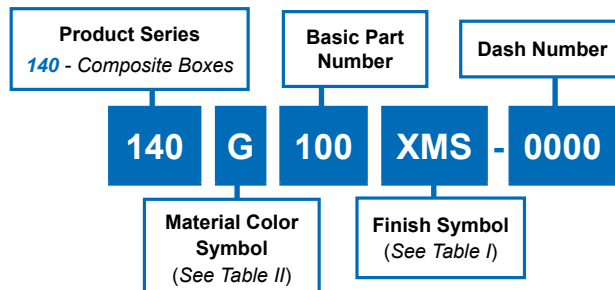
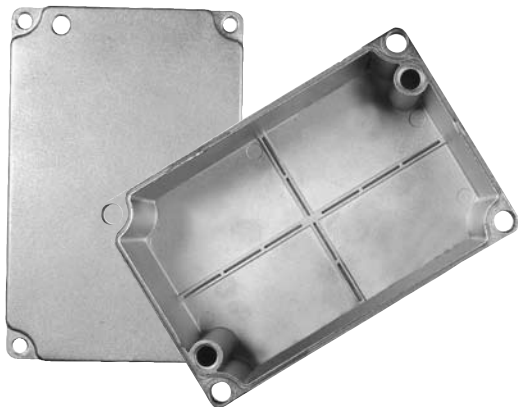
1. Use dash number 0000 for basic box with no additional options beyond your specified finish.
2. Box accommodates 1" MTC connector.
3. Metric dimensions (mm) are indicated in parentheses and are for reference only.

Series 140-074
 Ultra-Miniature Junction Box
 Product Facts and Dimensional Details



Composite
 Junction
 Boxes





**Mini
Series 140-100
CostSaver Composite
Junction Box**

TABLE II: MATERIAL COLOR & FINISH OPTIONS

Sym	Material & Color	Finish Options
B	Thermoplastic / Black	XO and XMS
G	Thermoplastic / Grey	XO and XMS
-	Thermoplastic / NA	XM, XW and XZN

TABLE I: FINISHES

Symbol	Finish Description
XO	No Plating (Non-Conductive Finish)
XMS	Internal Surfaces - Electroless Nickel External Surfaces - See Table II
XM	All Surfaces – Electroless Nickel
XW	All Surfaces – Cadmium Olive Drab over Electroless Nickel
XZN	All Surfaces – Zinc Nickel/Black
XMT	2000 Hour Corrosion Resistant Ni-PTFE, Nickel-Fluorocarbon Polymer. 1000 Hour Grey™

TABLE III: KEY DIMENSIONS

Box Series Number	External	Internal
140-100 Mini	2.55 (64.8) x 3.85 (97.8) x 1.38 (35.1)	2.08 (52.8) x 3.38 (85.9) x 1.06 (26.9)

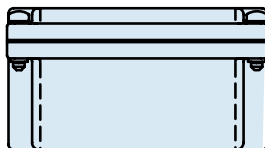
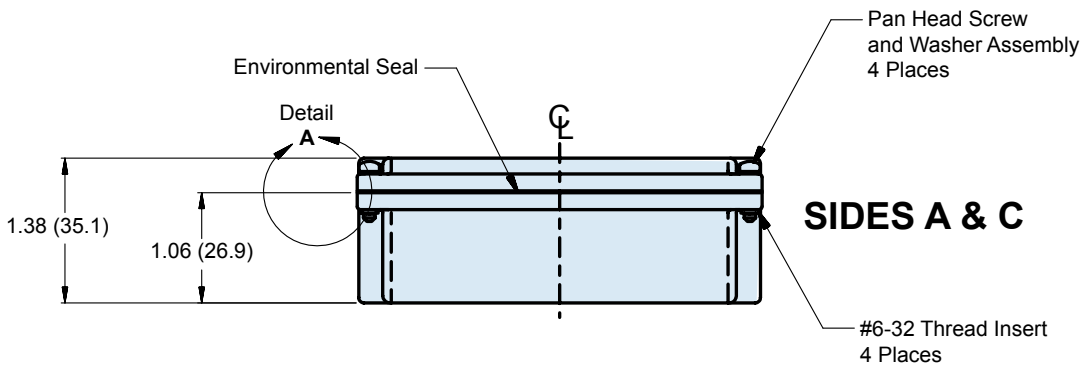
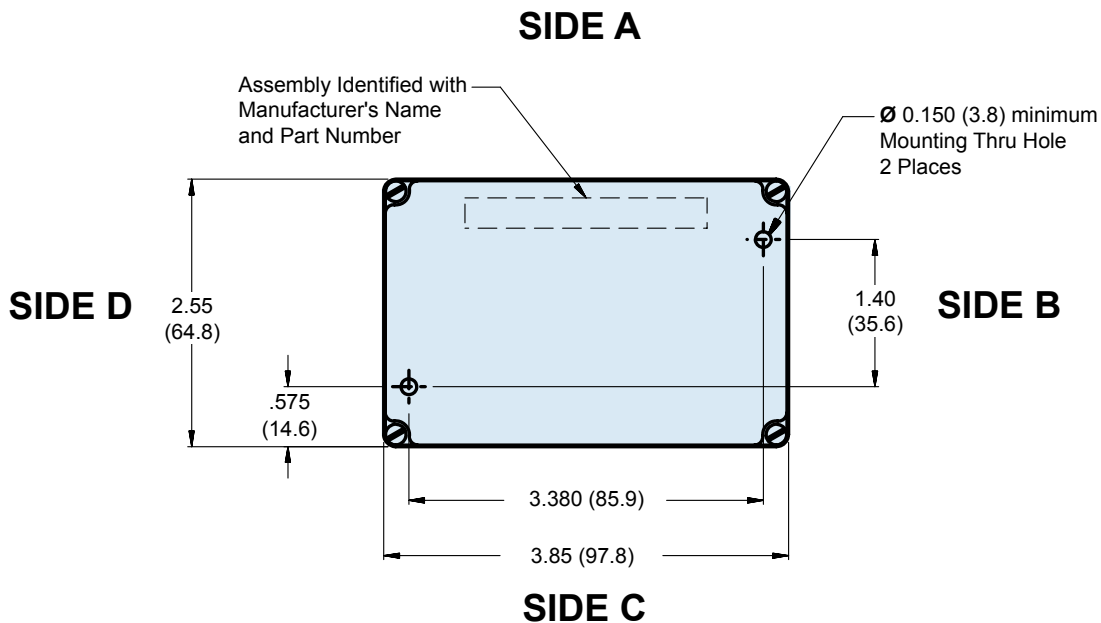
NOTES

1. Use Dash Number 0000 for Basic Box with No Additional Options Beyond Your Specified Finish. 0000 Basic Box Includes #6-32 UNC Fasteners.
2. Box Series Numbers are for reference only. Please complete the worksheet on E-14 and call the factory for part number assignment for your specific box configuration.
3. Metric dimensions (mm) are in parenthesis and for reference only

Series 140-100
Mini Junction Box

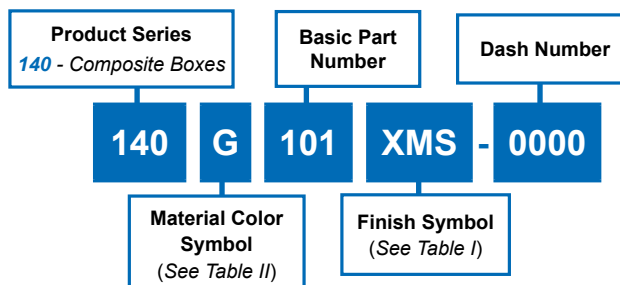
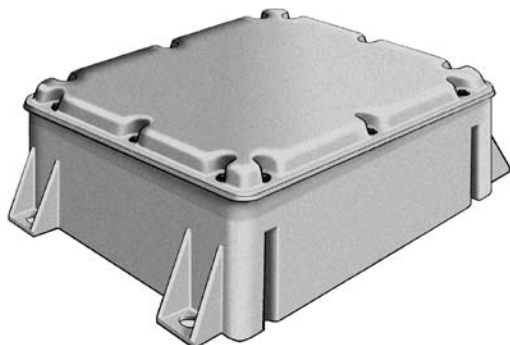


Composite
Junction
Boxes



SIDES B & D

E



**Small
Series 140-101
CostSaver Composite
Junction Box**

TABLE II: MATERIAL COLOR & FINISH OPTIONS

Sym	Material & Color	Finish Options
B	Thermoplastic / Black	XO and XMS
G	Thermoplastic / Grey	XO and XMS
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XM	All Surfaces - Electroless Nickel
XW	All Surfaces - Cadmium Olive Drab over Electroless Nickel
XZN	All Surfaces - Zinc Nickel/Black
XMT	2000 Hour Corrosion Resistant Ni-PTFE, Nickel-Fluorocarbon Polymer. 1000 Hour Grey™

TABLE III: KEY DIMENSIONS

Box Series Number	External Dimensions	Internal Dimensions (with Aluminum Mounting Plate Installed, if applicable)
Small 140-101	5.18 (132) x 6.00 (152) x 3.35 (85)	3.94 (100) x 4.72 (120) x 2.63 (67)

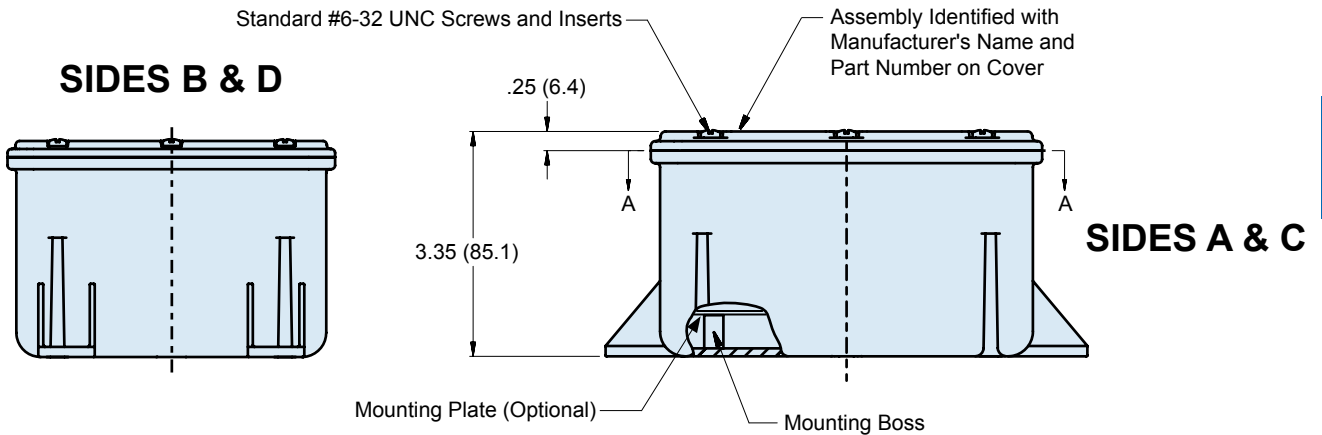
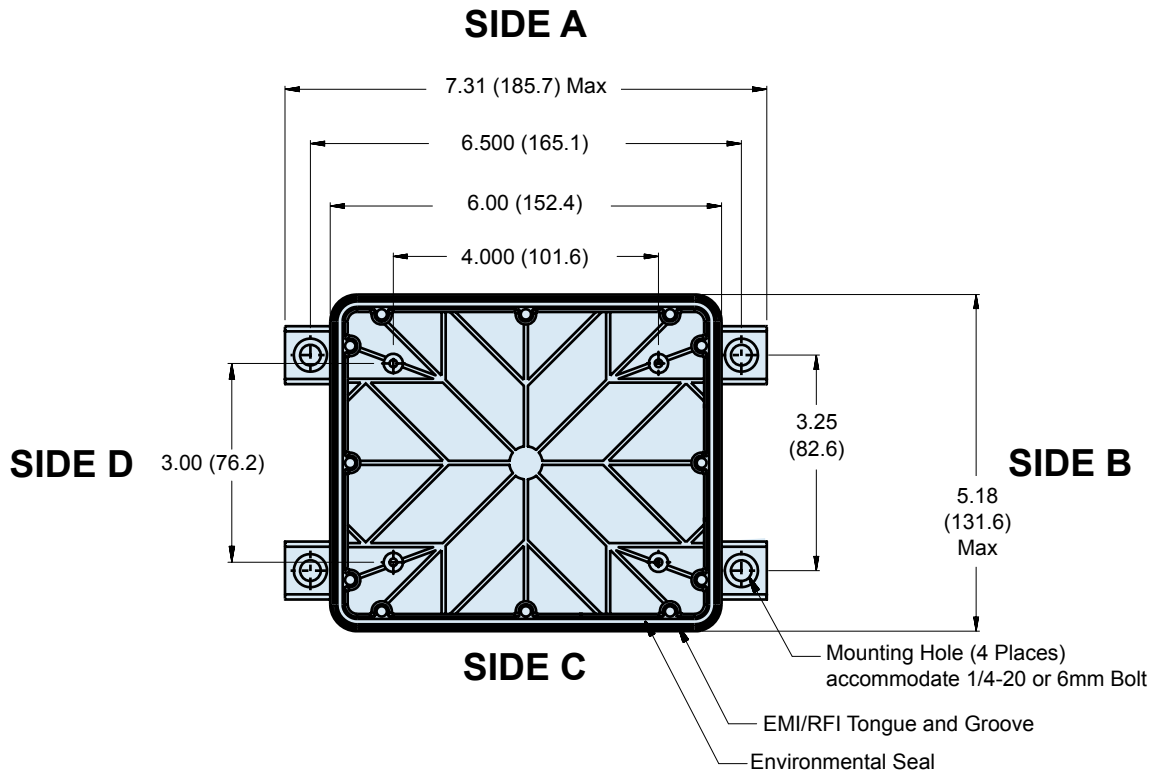
NOTES

1. Use Dash Number 0000 for Basic Box with No Additional Options Beyond Your Specified Finish. 0000 Basic Box Includes #6-32 UNC Fasteners.
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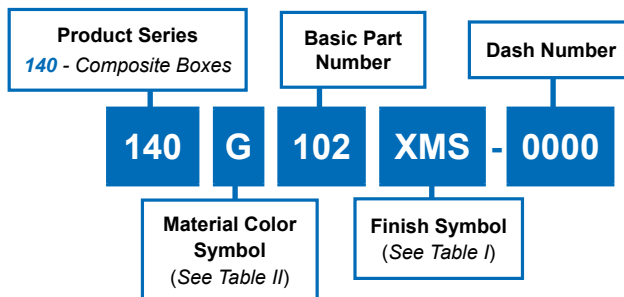
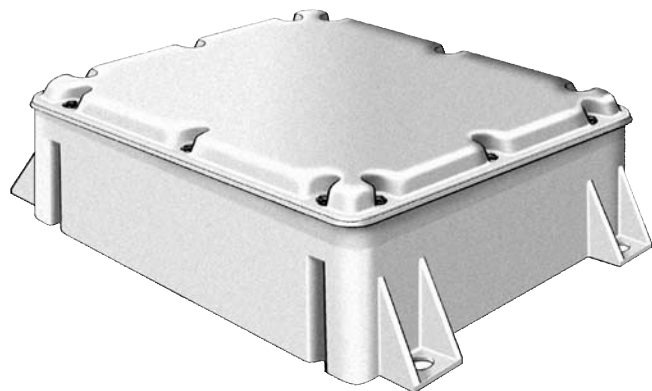
Series 140-101
Small Junction Box



Composite
Junction
Boxes



E



**Medium
Series 140-102
CostSaver Composite
Junction Box**

TABLE II: MATERIAL COLOR & FINISH OPTIONS

Sym	Material & Color	Finish Options
B	Thermoplastic / Black	XO and XMS
G	Thermoplastic / Grey	XO and XMS
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XMT	2000 Hour Corrosion Resistant Ni-PTFE, Nickel-Fluorocarbon Polymer. <i>1000 Hour Grey™</i>

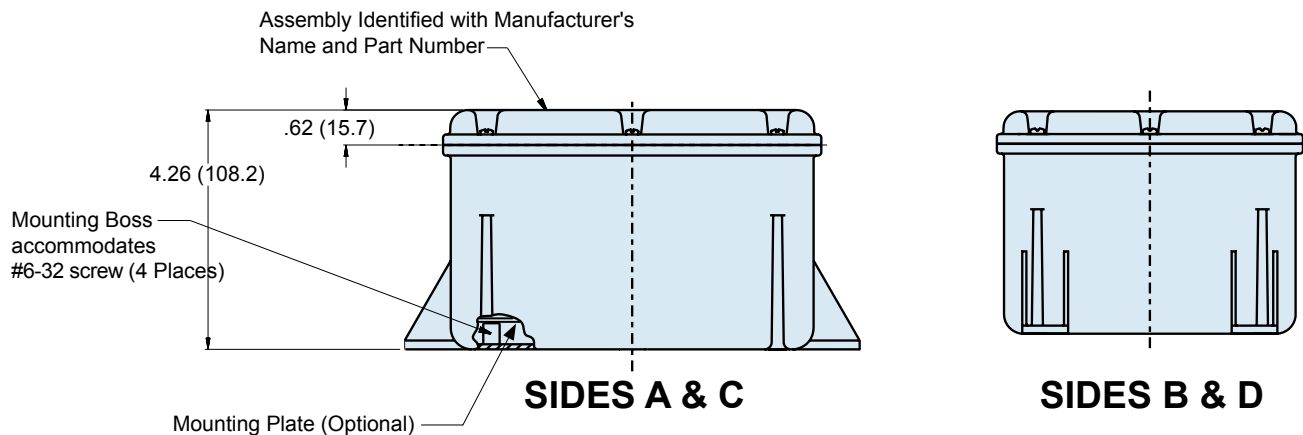
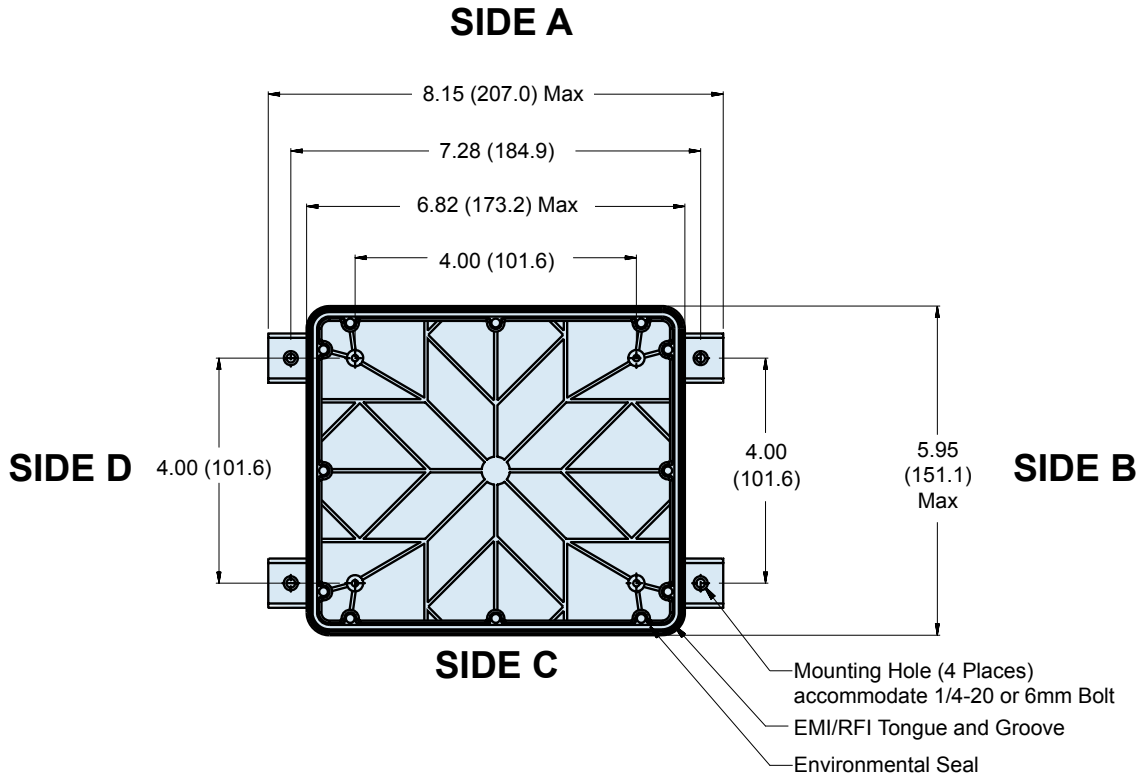
TABLE III: KEY DIMENSIONS

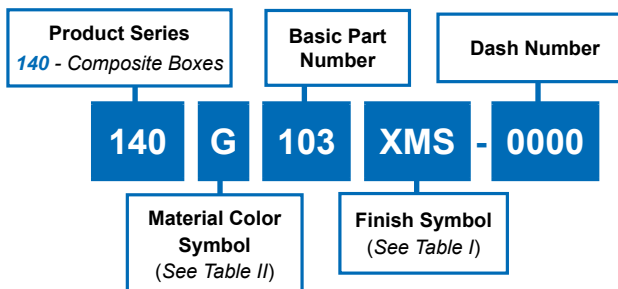
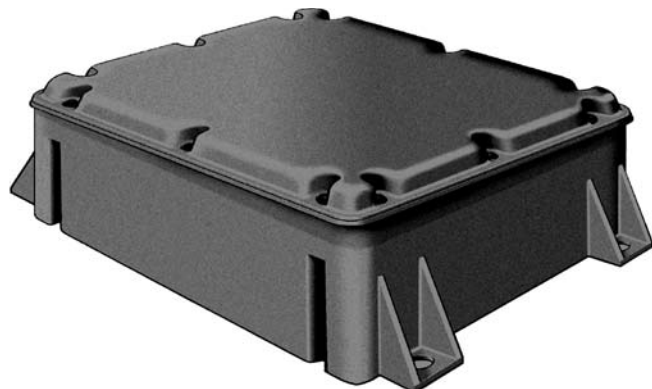
Box Series Number	External Dimensions	Internal Dimensions (with Aluminum Mounting Plate Installed, if applicable)
Medium 140-102	5.95 (151) x 6.82 (173) x 4.26 (108)	4.73 (120) x 5.91 (150) x 3.54 (90)

NOTES

1. Use Dash Number 0000 for Basic Box with No Additional Options Beyond Your Specified Finish. 0000 Basic Box Includes #6-32 UNC Fasteners.
2. Box Series Numbers are for reference only. Please complete the worksheet on E-14 and call the factory for part number assignment for your specific box configuration.
3. Metric dimensions (mm) are in parenthesis and for reference only

Series 140-102
Medium Junction Box





Large
Series 140-103
CostSaver Composite
Junction Box

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XZN	All Surfaces - Zinc Nickel/Black
XMT	2000 Hour Corrosion Resistant Ni-PTFE, Nickel-Fluorocarbon Polymer. <i>1000 Hour Grey™</i>

TABLE III: KEY DIMENSIONS

Box Series Number	External Dimensions	Internal Dimensions (with Aluminum Mounting Plate Installed, if applicable)
Large 140-103	9.10 (231) x 9.10 (231) x 4.50 (114)	7.87 (200) x 7.87 (200) x 3.78 (96)

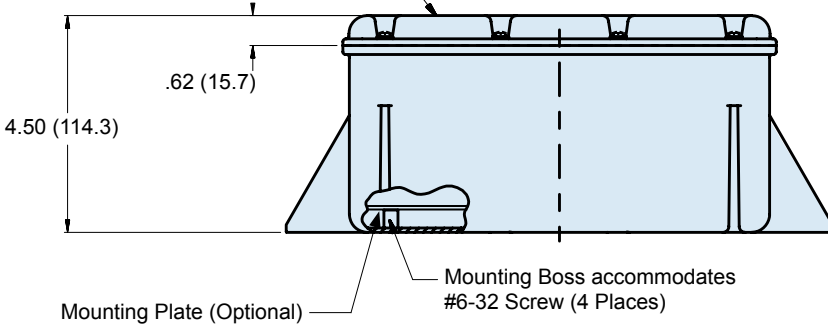
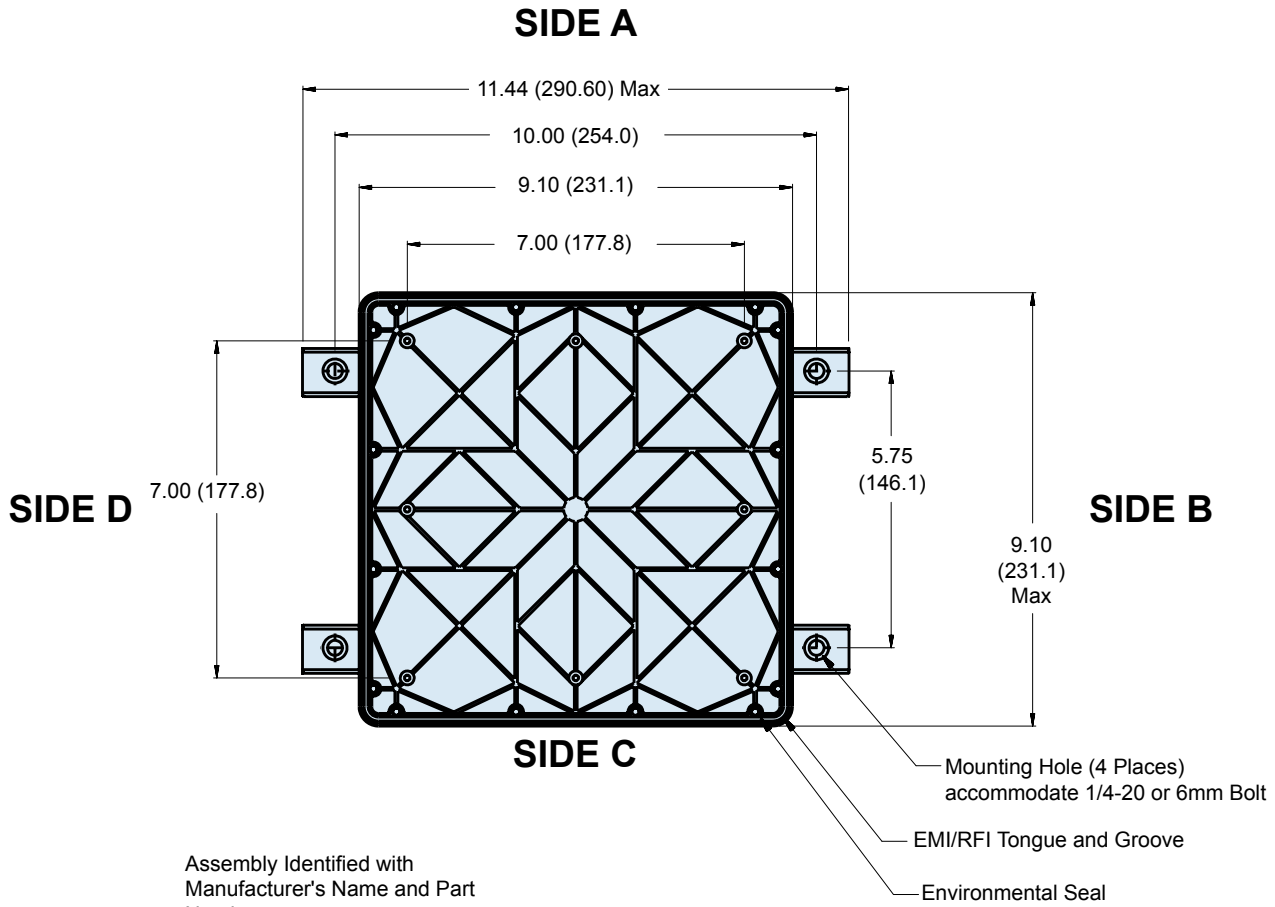
NOTES

- Use Dash Number 0000 for Basic Box with No Additional Options Beyond Your Specified Finish. 0000 Basic Box Includes #6-32 UNC Fasteners.
- Box Series Numbers are for reference only. Please complete the worksheet on E-14 and call the factory for part number assignment for your specific box configuration.
- Metric dimensions (mm) are in parenthesis and for reference only

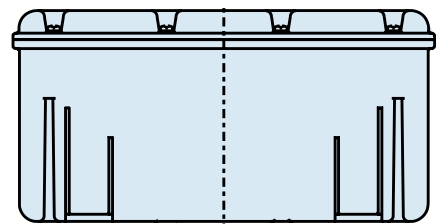
Series 140-103
Large Junction Box



Composite
Junction
Boxes



SIDES A & C



SIDES B & D



Series 140-104 Small Low-Profile Box



Small Low-Profile Series 140-104 CostSaver Composite Junction Box

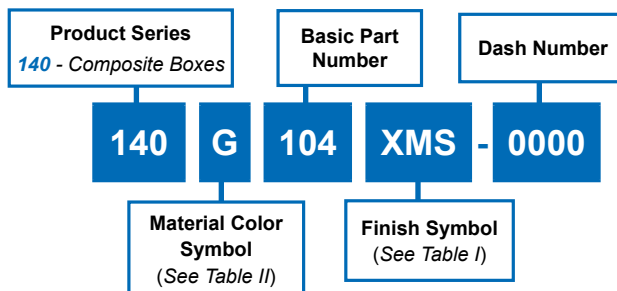


TABLE II: MATERIAL COLOR & FINISH OPTIONS

Sym	Material & Color	Finish Options
B	Thermoplastic / Black	XO and XMS
G	Thermoplastic / Grey	XO and XMS
-	Thermoplastic / NA	XM, XW and XZN

TABLE I: FINISHES

Symbol	Finish Description
XO	No Plating (Non-Conductive Finish)
XMS	Internal Surfaces - Electroless Nickel External Surfaces - See Table II
XM	All Surfaces - Electroless Nickel
XW	All Surfaces - Cadmium Olive Drab over Electroless Nickel
XZN	All Surfaces - Zinc Nickel/Black
XMT	2000 Hour Corrosion Resistant Ni-PTFE, Nickel-Fluorocarbon Polymer. 1000 Hour Grey™

TABLE III: KEY DIMENSIONS

Box Series Number	External Dimensions	Internal Dimensions (with Aluminum Mounting Plate Installed, if applicable)
Low-Profile 140-104	5.86 (149) x 5.86 (149) x 2.13 (54)	4.90 (124) x 4.90 (124) x 1.53 (39)

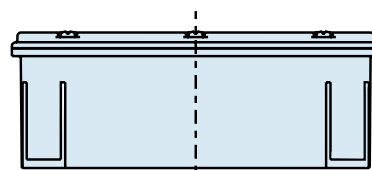
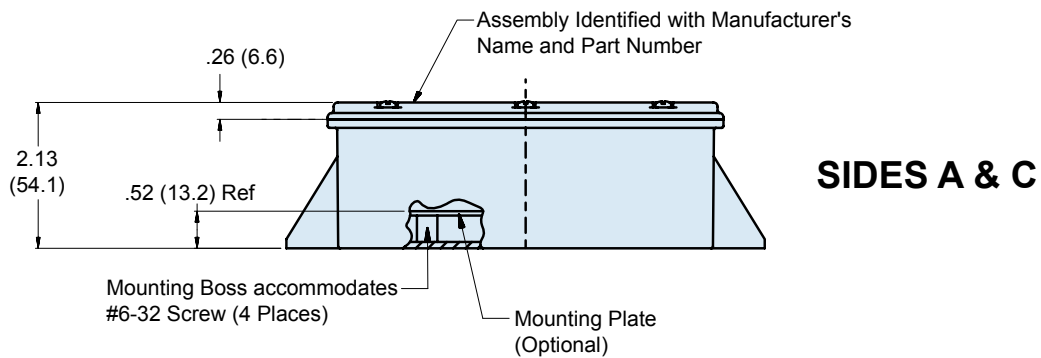
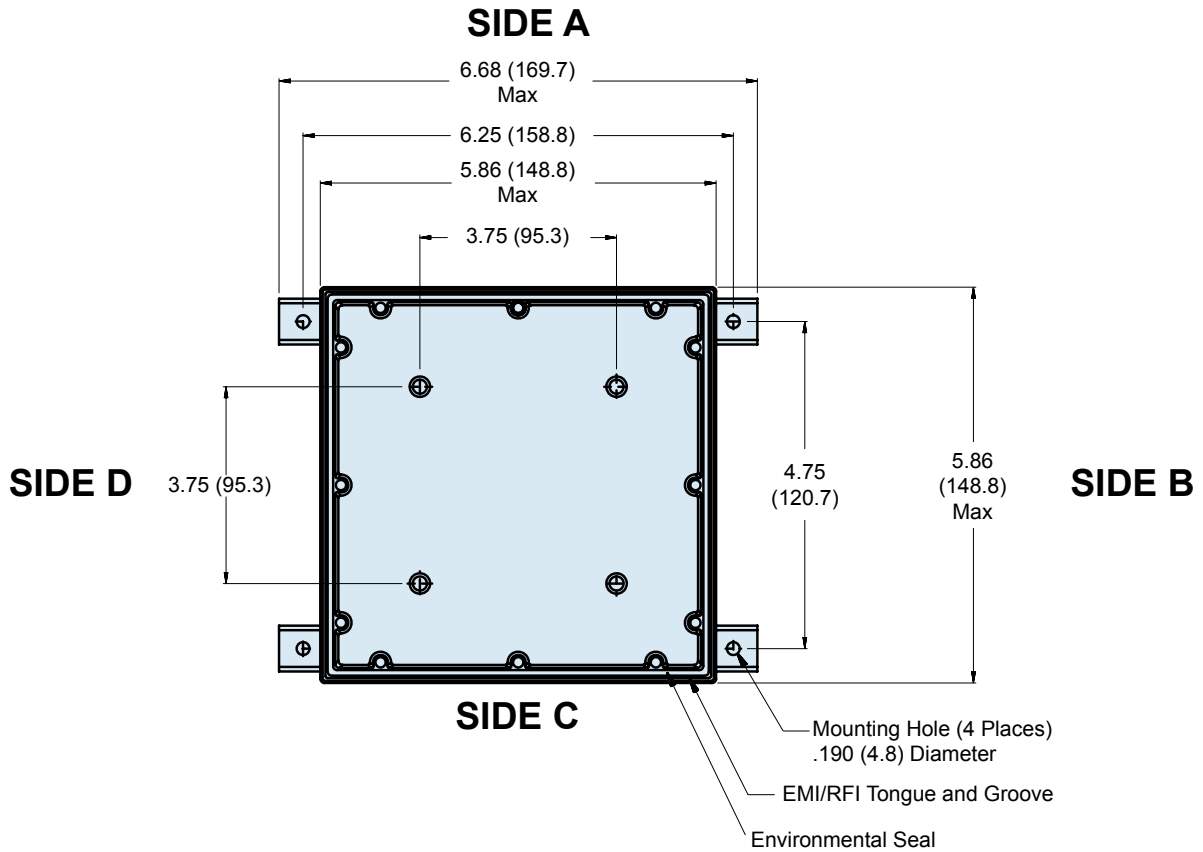
NOTES

- Use Dash Number 0000 for Basic Box with No Additional Options Beyond Your Specified Finish. 0000 Basic Box Includes #6-32 UNC Fasteners.
- Box Series Numbers are for reference only. Please complete the worksheet on E-14 and call the factory for part number assignment for your specific box configuration.
- Metric dimensions (mm) are in parenthesis and for reference only

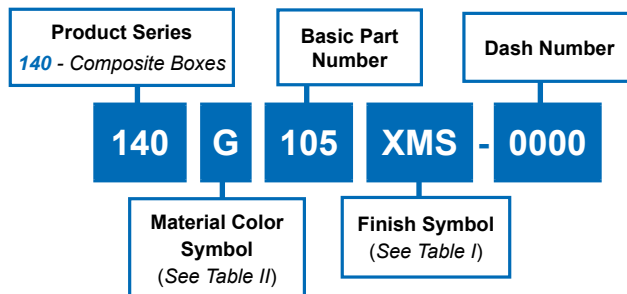
Series 140-104
Small Low-Profile Box



Composite
Junction
Boxes



E



**Medium Low-Profile
Series 140-105
CostSaver Composite
Junction Box**

TABLE II: MATERIAL COLOR & FINISH OPTIONS

Sym	Material & Color	Finish Options
B	Thermoplastic / Black	XO and XMS
G	Thermoplastic / Grey	XO and XMS
-	Thermoplastic / NA	XM, XW and XZN

TABLE I: FINISHES

Symbol	Finish Description
XO	No Plating (Non-Conductive Finish)
XMS	Internal Surfaces - Electroless Nickel External Surfaces - See Table II
XM	All Surfaces - Electroless Nickel
XW	All Surfaces - Cadmium Olive Drab over Electroless Nickel
XZN	All Surfaces - Zinc Nickel/Black
XMT	2000 Hour Corrosion Resistant Ni-PTFE, Nickel-Fluorocarbon Polymer. 1000 Hour Grey™

TABLE III: KEY DIMENSIONS

Box Series Number	External Dimensions	Internal Dimensions (with Aluminum Mounting Plate Installed, if applicable)
Medium Low-Profile 140-105	6.93 (176) x 5.85 (149) x 2.44 (62.0)	4.92 (125) x 6.02 (153) x 1.90 (48)

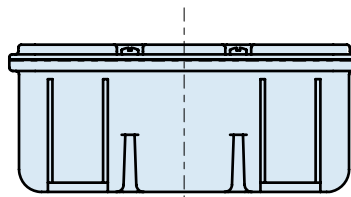
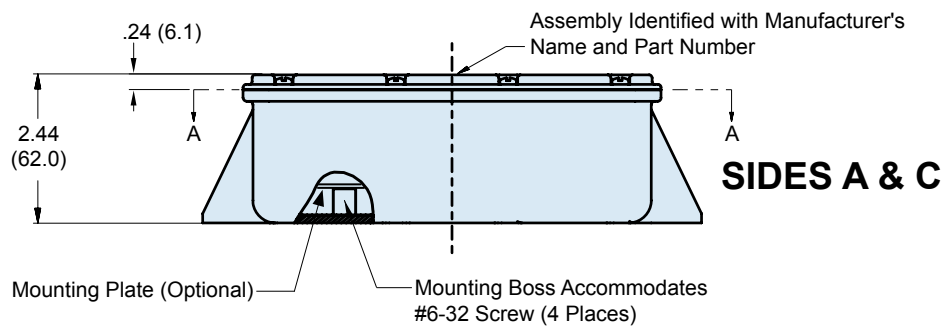
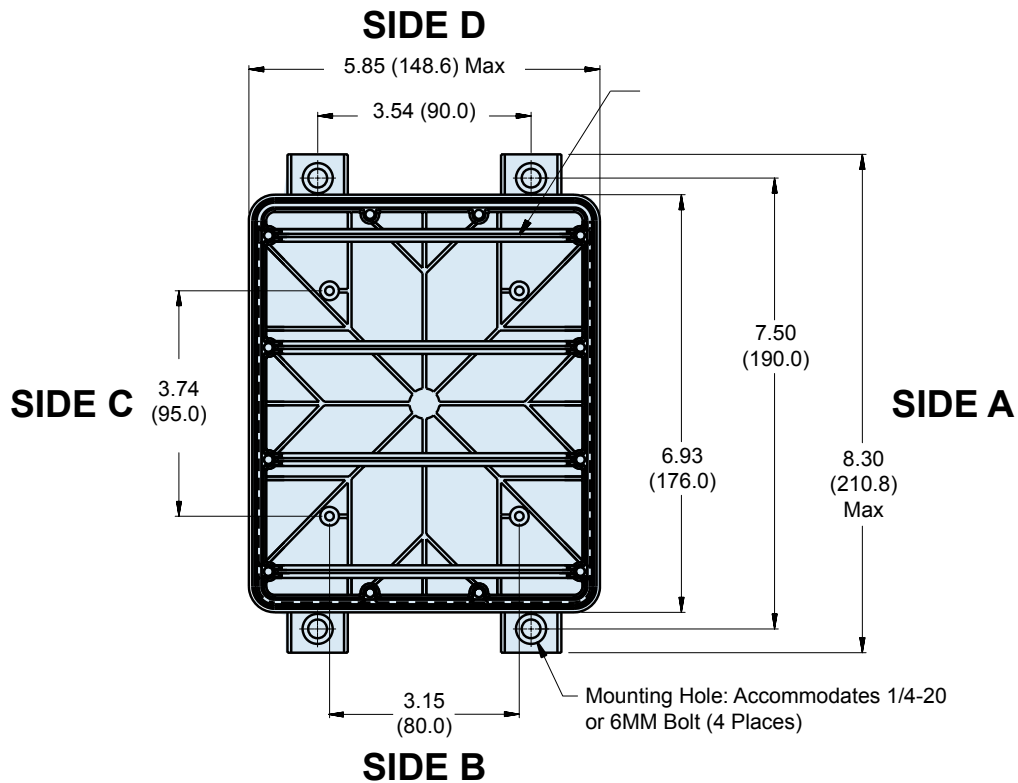
NOTES

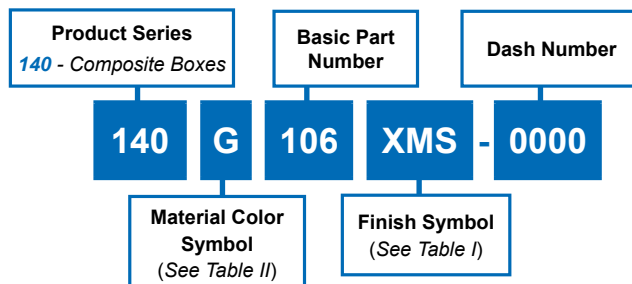
1. Use Dash Number 0000 for Basic Box with No Additional Options Beyond Your Specified Finish. 0000 Basic Box Includes #6-32 UNC Fasteners.
2. Box Series Numbers are for reference only. Please complete the worksheet on E-14 and call the factory for part number assignment for your specific box configuration.
3. Metric dimensions (mm) are in parenthesis and for reference only

Series 140-105
Medium Low-Profile Junction Box



Composite
Junction
Boxes





**Three-Legged
Series 140-106
CostSaver Composite
Junction Box**

TABLE II: MATERIAL COLOR & FINISH OPTIONS

Sym	Material & Color	Finish Options
B	Thermoplastic / Black	XO and XMS
G	Thermoplastic / Grey	XO and XMS
-	Thermoplastic / NA	XM, XW and XZN

TABLE I: FINISHES

Symbol	Finish Description
XO	No Plating (Non-Conductive Finish)
XMS	Internal Surfaces - Electroless Nickel External Surfaces - See Table II
XM	All Surfaces – Electroless Nickel
XW	All Surfaces – Cadmium Olive Drab over Electroless Nickel
XZN	All Surfaces – Zinc Nickel/Black
XMT	2000 Hour Corrosion Resistant Ni-PTFE, Nickel-Fluorocarbon Polymer. <i>1000 Hour Grey™</i>

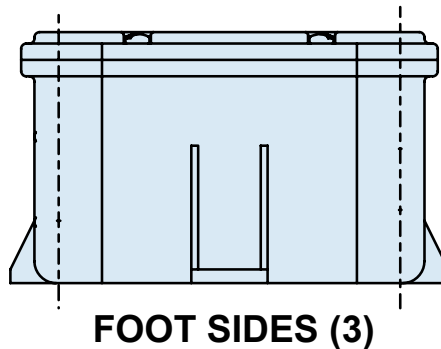
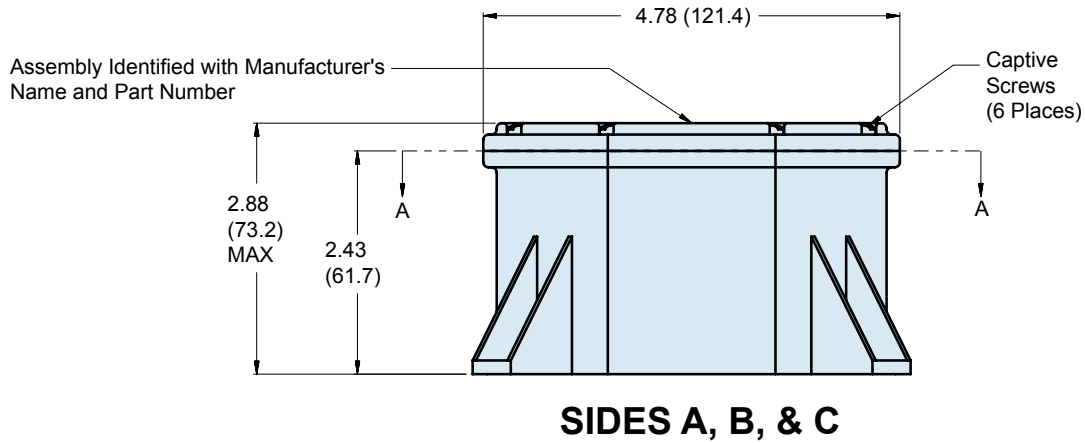
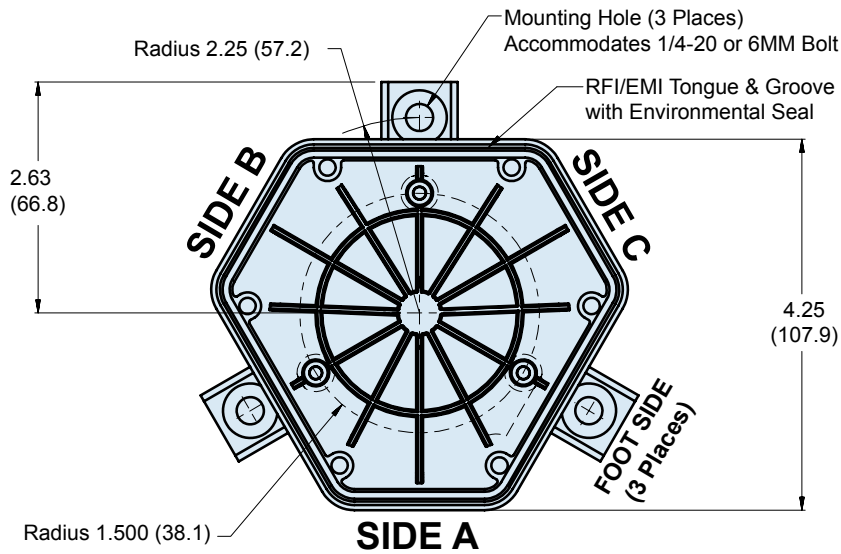
TABLE III: KEY DIMENSIONS

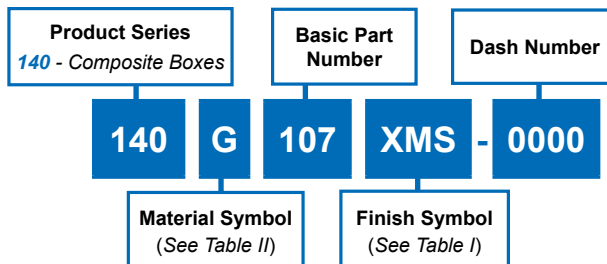
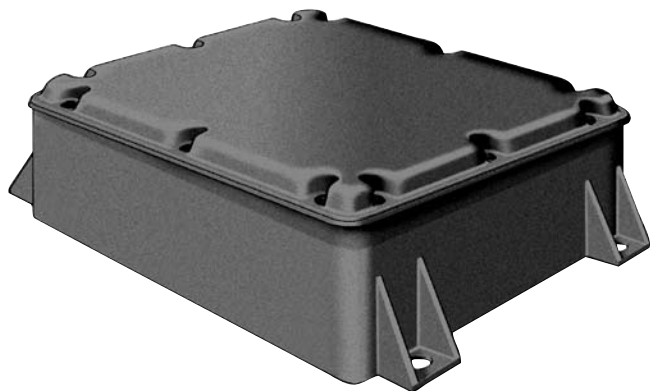
Box Series Number	External Dimensions	Internal Dimensions (with Aluminum Mounting Plate Installed, if applicable)
Three-Legged 140-106	2.88 (73.2) X 4.82 (122.4) X 4.28 (108.7)	2.50 (63.5) X 3.75 (95.3) X 3.75 (95.3)

NOTES

1. Use Dash Number 0000 for Basic Box with No Additional Options Beyond Your Specified Finish. 0000 Basic Box Includes #6-32 UNC Fasteners.
2. Box Series Numbers are for reference only. Please complete the worksheet on E-14 and call the factory for part number assignment for your specific box configuration.
3. Metric dimensions (mm) are in parenthesis and for reference only

Series 140-106
Small Three-Legged Junction Box





**Jumbo
Series 140-107
CostSaver Composite
Junction Box**

TABLE II: MATERIAL COLOR & FINISH OPTIONS

Sym	Material & Color	Finish Options
B	Thermoplastic / Black	XO and XMS
G	Thermoplastic / Grey	XO and XMS
-	Thermoplastic / NA	XM, XW and XZN

TABLE I: FINISHES

Symbol	Finish Description
XO	No Plating (Non-Conductive Finish)
XMS	Internal Surfaces - Electroless Nickel External Surfaces - See Table II
XM	All Surfaces – Electroless Nickel
XW	All Surfaces – Cadmium Olive Drab over Electroless Nickel
XZN	All Surfaces – Zinc Nickel/Black
XMT	2000 Hour Corrosion Resistant Ni-PTFE, Nickel-Fluorocarbon Polymer. <i>1000 Hour Grey™</i>

TABLE III: KEY DIMENSIONS

Box Series Number	External Dimensions	Internal Dimensions (with Aluminum Mounting Plate Installed, if applicable)
Jumbo 140-107	9.13 (232) x 11.63 (295) x 3.88 (98.5)	8.0 (203) x 10.50 (267) x 3.0 (76)

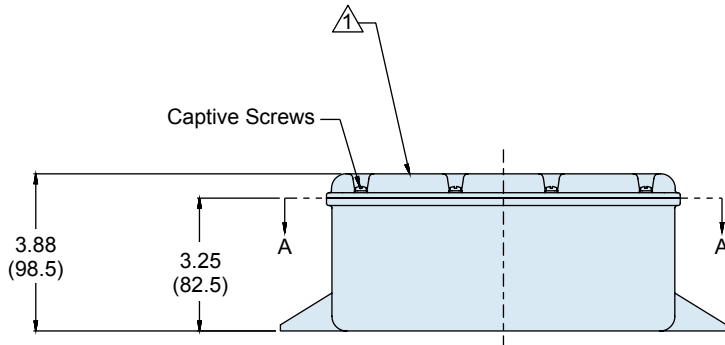
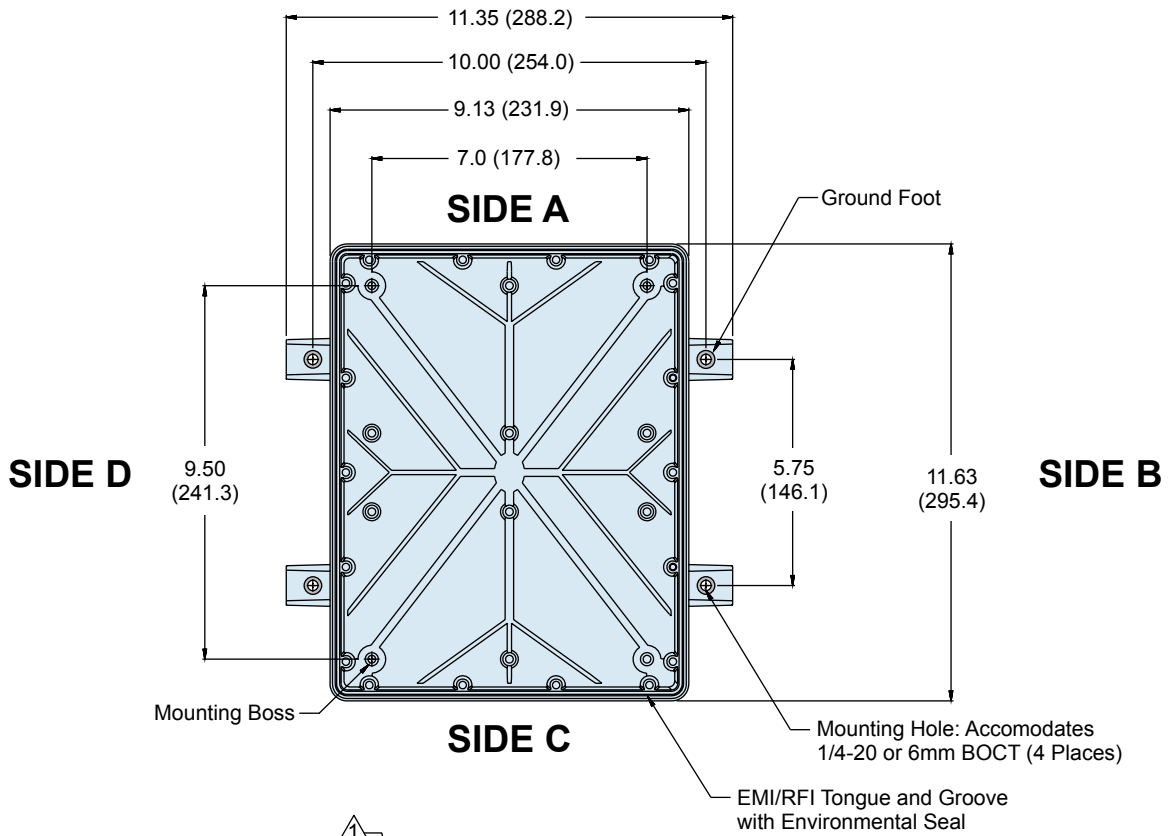
NOTES

- Use Dash Number 0000 for Basic Box with No Additional Options Beyond Your Specified Finish. 0000 Basic Box Includes #6-32 UNC Fasteners.
- Box Series Numbers are for reference only. Please complete the worksheet on E-14 and call the factory for part number assignment for your specific box configuration.
- Metric dimensions (mm) are in parenthesis and for reference only

Series 140-107
Jumbo Junction Box

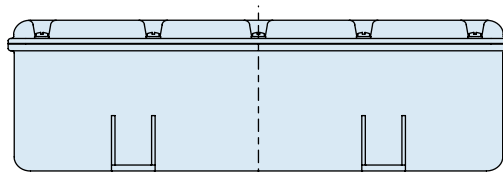


Composite
Junction
Boxes



**SIDES
A and C**

**SIDES
B and D**



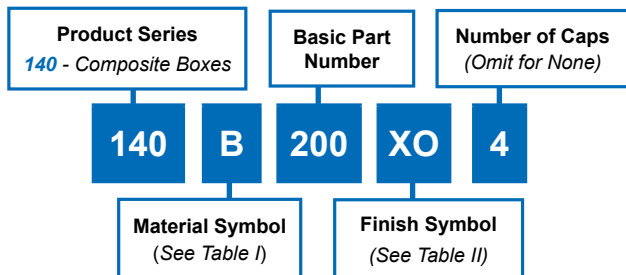


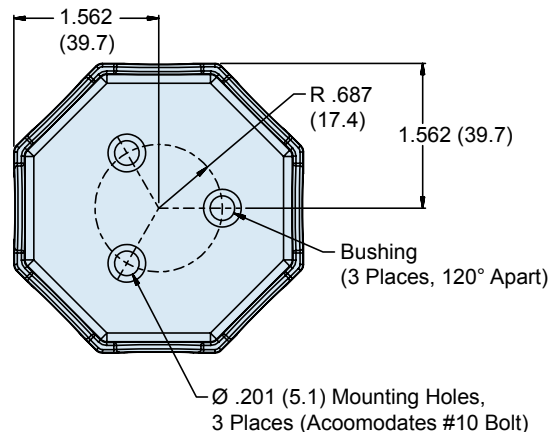
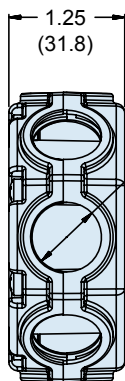
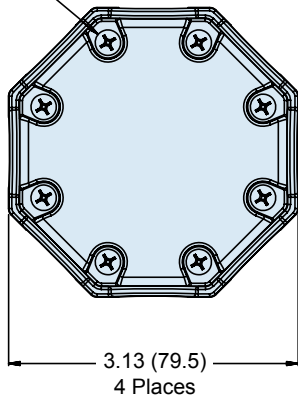
TABLE I: MATERIAL COLOR & FINISH OPTIONS

Sym	Material & Color	Finish Options
B	Thermoplastic / Black	XO and XMS
G	Thermoplastic / Grey	XO and XMS
-	Thermoplastic / NA	XM, XW and XZN

TABLE II: FINISHES

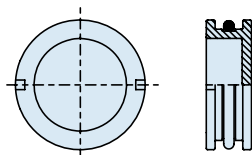
Symbol	Finish Description
XO	No Plating (Non-Conductive Finish)
XMS	Internal Surfaces - Electroless Nickel External Surfaces - See Table II
XM	All Surfaces - Electroless Nickel
XW	All Surfaces - Cadmium Olive Drab over Electroless Nickel
XZN	All Surfaces - Zinc Nickel/Black
XMT	2000 Hour Corrosion Resistant Ni-PTFE, Nickel-Fluorocarbon Polymer. 1000 Hour Grey™

Captive Screw
8 Places



NOTES

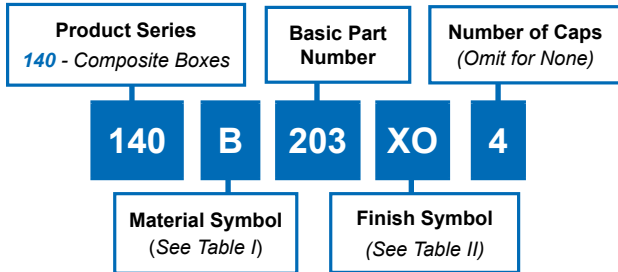
- Box series numbers are for reference only. Please complete the worksheet on E-14 and call the factory for part number assignment for your specific box configuration.
- Metric dimensions (mm) are in parentheses and are for reference only.



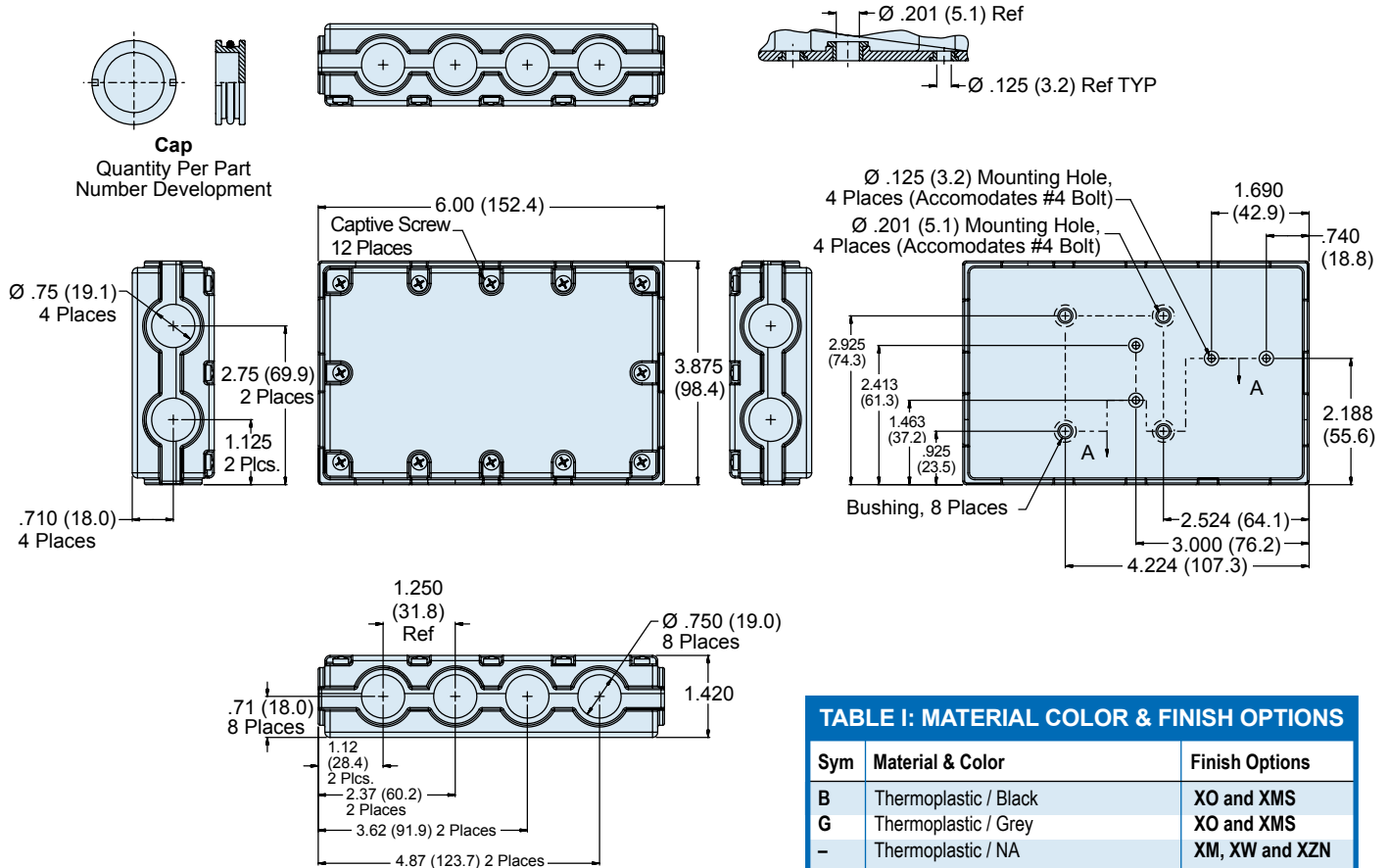
Cap

Quantity Per
Part Number Development

Series 140-203 12 Port Rectangular Junction Box



Symbol	Finish Description
XO	No Plating (Non-Conductive Finish)
XMS	Internal Surfaces - Electroless Nickel External Surfaces - See Table I
XM	All Surfaces - Electroless Nickel
XW	All Surfaces - Cadmium Olive Drab over Electroless Nickel
XZN	All Surfaces - Zinc Nickel/Black
XMT	2000 Hour Corrosion Resistant Ni-PTFE, Nickel-Fluorocarbon Polymer. 1000 Hour Grey™



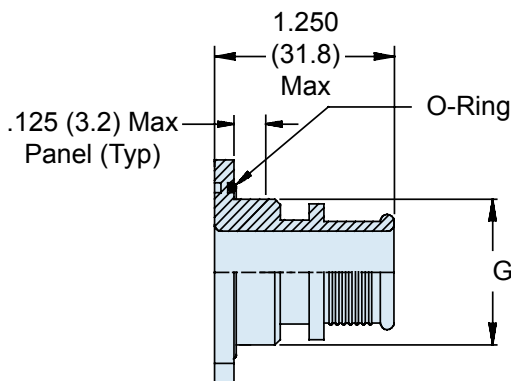
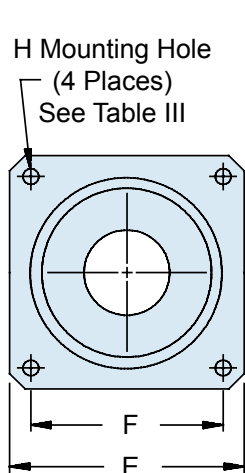
Sym	Material & Color	Finish Options
B	Thermoplastic / Black	XO and XMS
G	Thermoplastic / Grey	XO and XMS
-	Thermoplastic / NA	XM, XW and XZN

- NOTES**
- Box series numbers are for reference only. Please complete the worksheet on E-14 and call the factory for part number assignment for your specific box configuration.
 - Metric dimensions (mm) are in parentheses and for reference only.

630-030 Composite Thru-Box, Panel and Bulkhead RFI/EMI/Environmental Banding Adapter



Composite
Junction
Boxes



**Type C
Flange Mount**

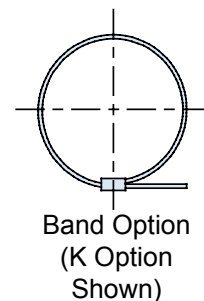


TABLE I: CABLE ENTRY

Entry Code	Cable Entry Dia	A Thread Unified	B Dim	C Flat		D Dia		E Sq	F Dim.	G Dia	
				$\pm .010$ ($\pm .3$)	$\pm .010$ ($\pm .3$)	$\pm .031$ ($\pm .8$)	$\pm .031$ ($\pm .8$)			$+.005$ ($+.1$)	$-.015$ ($-.4$)
03	.188 (4.8)	1/2 -28	.688 (17.5)	.480 (12.2)	.515 (13.1)	.875 (22.2)	.594 (15.1)	.594 (15.1)	.500 (12.7)		
04	.250 (6.4)	1/2 -28	.688 (17.5)	.480 (12.2)	.515 (13.1)	.875 (22.2)	.594 (15.1)	.594 (15.1)	.500 (12.7)		
05	.313 (8.0)	5/8 -24	.813 (20.7)	.605 (15.4)	.640 (16.3)	1.000 (25.4)	.719 (18.3)	.719 (18.3)	.625 (15.9)		
06	.375 (9.5)	5/8 -24	.813 (20.7)	.605 (15.4)	.640 (16.3)	1.000 (25.4)	.719 (18.3)	.719 (18.3)	.625 (15.9)		
07	.438 (11.1)	3/4 -20	.938 (23.8)	.730 (18.5)	.765 (19.4)	1.094 (27.8)	.812 (20.6)	.812 (20.6)	.750 (19.1)		
08	.500 (12.7)	3/4 -20	.938 (23.8)	.730 (18.5)	.765 (19.4)	1.094 (27.8)	.812 (20.6)	.812 (20.6)	.750 (19.1)		
09	.563 (14.3)	7/8 -20	1.063 (27.0)	.855 (21.7)	.890 (22.6)	1.188 (30.2)	.906 (23.0)	.906 (23.0)	.875 (22.2)		
10	.625 (15.9)	7/8 -20	1.063 (27.0)	.855 (21.7)	.890 (22.6)	1.188 (30.2)	.906 (23.0)	.906 (23.0)	.875 (22.2)		
11	.688 (17.5)	1 -20	1.188 (30.2)	.980 (24.9)	1.015 (25.8)	1.281 (32.5)	.969 (24.6)	.969 (24.6)	1.000 (25.4)		
12	.750 (19.1)	1 -20	1.188 (30.2)	.980 (24.9)	1.015 (25.8)	1.281 (32.5)	.969 (24.6)	.969 (24.6)	1.000 (25.4)		
13	.813 (20.7)	1 1/8 -18	1.313 (33.4)	1.105 (28.1)	1.140 (29.0)	1.375 (34.9)	1.062 (27.0)	1.062 (27.0)	1.125 (28.6)		
14	.875 (22.2)	1 1/4 -18	1.438 (36.5)	1.230 (31.2)	1.265 (32.1)	1.500 (38.1)	1.156 (29.4)	1.156 (29.4)	1.250 (31.8)		
15	.938 (23.8)	1 1/4 -18	1.438 (36.5)	1.230 (31.2)	1.265 (32.1)	1.500 (38.1)	1.156 (29.4)	1.156 (29.4)	1.250 (31.8)		
16	1.000 (25.4)	1 3/8 -18	1.563 (39.7)	1.355 (34.4)	1.390 (35.3)	1.625 (41.3)	1.250 (31.8)	1.250 (31.8)	1.375 (34.9)		
17	1.063 (27.0)	1 3/8 -18	1.563 (39.7)	1.355 (34.4)	1.390 (35.3)	1.625 (41.3)	1.250 (31.8)	1.250 (31.8)	1.375 (34.9)		
18	1.125 (28.6)	1 1/2 -18	1.688 (42.9)	1.480 (37.6)	1.515 (38.5)	1.750 (44.5)	1.375 (34.9)	1.375 (34.9)	1.500 (38.1)		
19	1.188 (30.2)	1 1/2 -18	1.688 (42.9)	1.480 (37.6)	1.515 (38.5)	1.750 (44.5)	1.375 (34.9)	1.375 (34.9)	1.500 (38.1)		
20	1.250 (31.8)	1 5/8 -18	1.813 (46.1)	1.605 (40.8)	1.640 (41.7)	1.812 (46.0)	1.500 (38.1)	1.500 (38.1)	1.625 (41.3)		
22	1.375 (34.9)	1 3/4 -18	1.938 (49.2)	1.730 (43.9)	1.765 (44.8)	2.000 (50.8)	1.562 (39.7)	1.562 (39.7)	1.750 (44.5)		
24	1.500 (38.1)	2 -18	2.188 (55.6)	1.980 (50.3)	2.015 (51.2)	2.250 (57.2)	1.750 (44.5)	1.750 (44.5)	2.000 (50.8)		
26	1.625 (41.3)	2 -18	2.188 (55.6)	1.980 (50.3)	2.015 (51.2)	2.250 (57.2)	1.750 (44.5)	1.750 (44.5)	2.000 (50.8)		
28	1.750 (44.5)	2 1/4 -16	2.438 (61.9)	2.230 (56.6)	2.265 (57.5)	2.500 (63.5)	1.938 (49.2)	1.938 (49.2)	2.250 (57.2)		

TABLE II

Symbol	Finish Description
XM	2000 Hour Corrosion Resistant Electroless Nickel
XMT	2000 Hour Corrosion Resistant Ni-PTFE, Nickel-Fluorocarbon Polymer. 1000 Hour Grey™
XW	2000 Hour Corrosion Resistant Cadmium/Olive Drab over Electroless Nickel

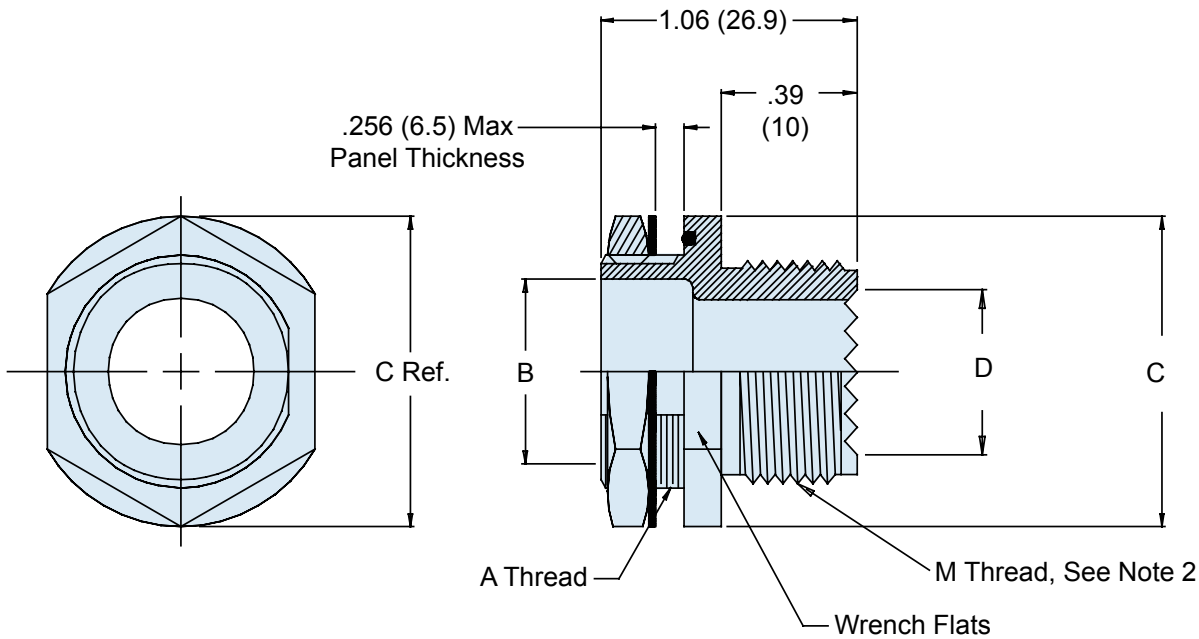
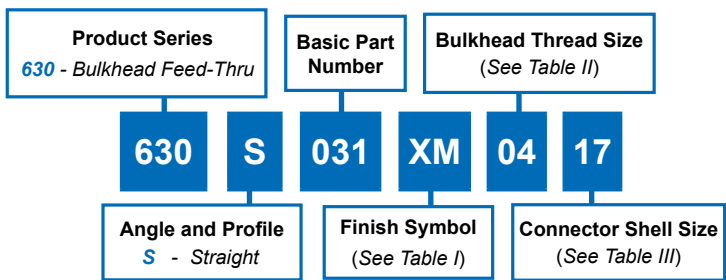
TABLE III: MOUNTING

	H Dia
Dash Nos.	+ .015 (+ .4) - .000 (- .0)
03-17	.125 (3.2)
18-20	.156 (4.0)
22-28	.188 (4.8)

APPLICATION NOTES

- Metric dimensions (mm) are in parentheses and are for reference only
- Consult factory for shrink boot to be supplied with part.

630-031 Composite Thru-Box, Panel and Bulkhead Universal Environmental Adapter



E

- APPLICATION NOTES**
1. Metric dimensions (mm) are in parentheses and are for reference only.
 2. MIL-DTL-38999 Series 3 & 4 Accessory Interface, Glenair Code H.

630-031
Composite Thru-Box, Panel and Bulkhead
Universal Environmental Adapter



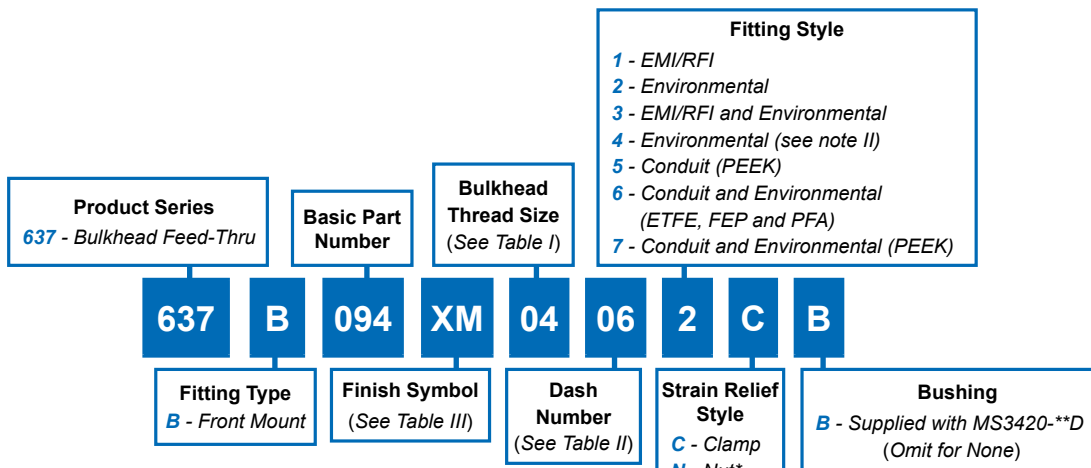
Composite
 Junction
 Boxes

TABLE I	
Symbol	Finish Description
XM	2000 Hour Corrosion Resistant Electroless Nickel
XMT	2000 Hour Corrosion Resistant Ni-PTFE, Nickel-Fluorocarbon Polymer. <i>1000 Hour Grey™</i>
XW	2000 Hour Corrosion Resistant Cadmium/Olive Drab over Electroless Nickel

TABLE II: BULKHEAD THREAD SIZE						
Dash No.	A Thread ISO Metric	B Dia. Min.	C Max.	Max Entry Table 3		
01	M 16 x 1.5-6g	.394 (10.0)	1.070 (27.2)	11		
02	M 20 x 1.5-6g	.551 (14.0)	1.200 (30.5)	13		
03	M 27 x 2.0-6g	.866 (22.0)	1.510 (38.4)	21		
04	M 36 x 2.0-6g	1.181 (30.0)	2.010 (51.1)	25		

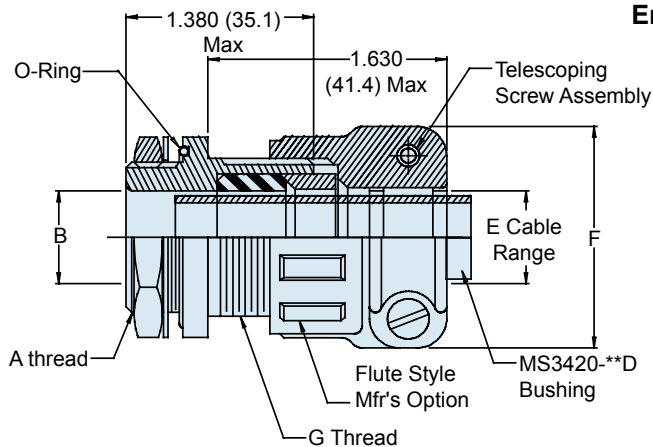
TABLE III: CONNECTOR SHELL SIZE			
Shell Size	M Thread ISO Metric	D Min	
09	M 12 x 1.0-6g	.250	(6.4)
11	M 15 x 1.0-6g	.375	(9.5)
13	M 18 x 1.0-6g	.500	(12.7)
15	M 22 x 1.0-6g	.625	(15.9)
17	M 25 x 1.0-6g	.750	(19.1)
19	M 28 x 1.0-6g	.812	(20.6)
21	M 31 x 1.0-6g	.938	(23.8)
23	M 34 x 1.0-6g	1.062	(27.0)
25	M 37 x 1.0-6g	1.188	(30.2)

E

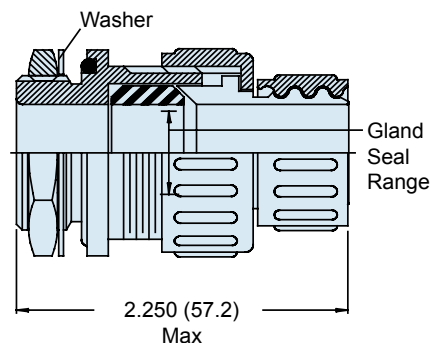


*(for styles A, B and C only)

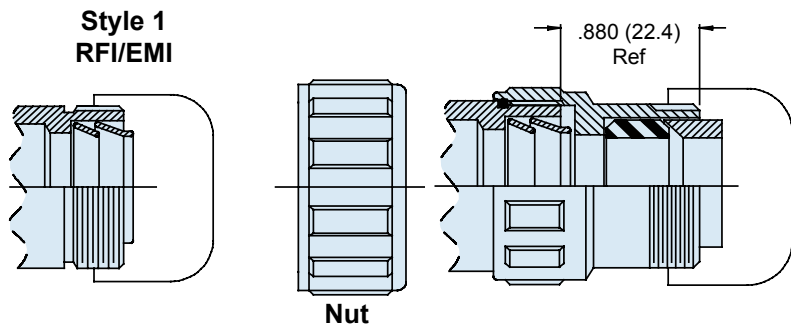
Type B Environmental Style 2



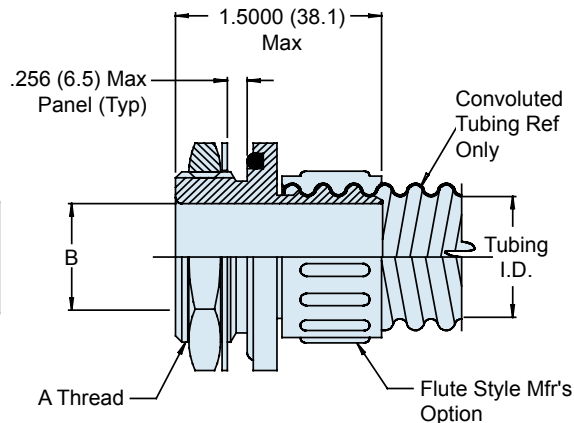
Type B Environmental Conduit Adapter Style 6 or 7



Type B RFI/EMI & Environmental Style 3



Type B Conduit Adapter Style 5



E

637-094
Composite Box Conduit or Cable
Feed-Through Adapter Series



Composite
Junction
Boxes

TABLE I: BULKHEAD THREAD SIZE

Dash No.	A Thread ISO Metric	B Ref Diameter	C	D Max Diameter	Max Entry Table II
01	M16 x 1.5-6g	.55 (14.0)	.875 (22.2)	1.06 (27.2)	06
02	M20 x 1.5-6g	.61 (15.5)	1.062 (27.0)	1.19 (30.5)	10
03	M27 x 2.0-6g	.86 (21.8)	1.375 (34.9)	1.50 (38.4)	16
04	M36 x 2.0-6g	1.21 (30.7)	1.750 (44.5)	2.00 (51.1)	20
05	1-20 UNEF-2A	.78 (19.8)	1.250 (31.8)	1.38 (35.3)	12

TABLE II: CONNECTOR SHELL SIZE ORDER NUMBER

Dash No.	E		F Max	G Thread		Ref. Conduit Size Styles 5, 6 & 7
	Min	Max		Unified Class 2A	MS3420-**D	
04	.188 (4.8)	.312 (7.9)	1.150 (29.2)	11/16-24	-04	14
06	.291 (7.1)	.438 (11.1)	1.270 (32.3)	13/16-20	-06	16
10	.375 (9.5)	.610 (15.5)	1.460 (37.1)	1 1/16-18	-06 & -10	24
12	.438 (11.1)	.750 (19.1)	1.620 (41.1)	1 1/4-18	-08 & -12	28
16	.625 (15.9)	.860 (21.8)	1.770 (44.9)	1 1/2-18	-12 & -16	32
20	.875 (22.2)	1.210 (30.7)	2.060 (52.3)	1 13/16-16	-16 & -20	40

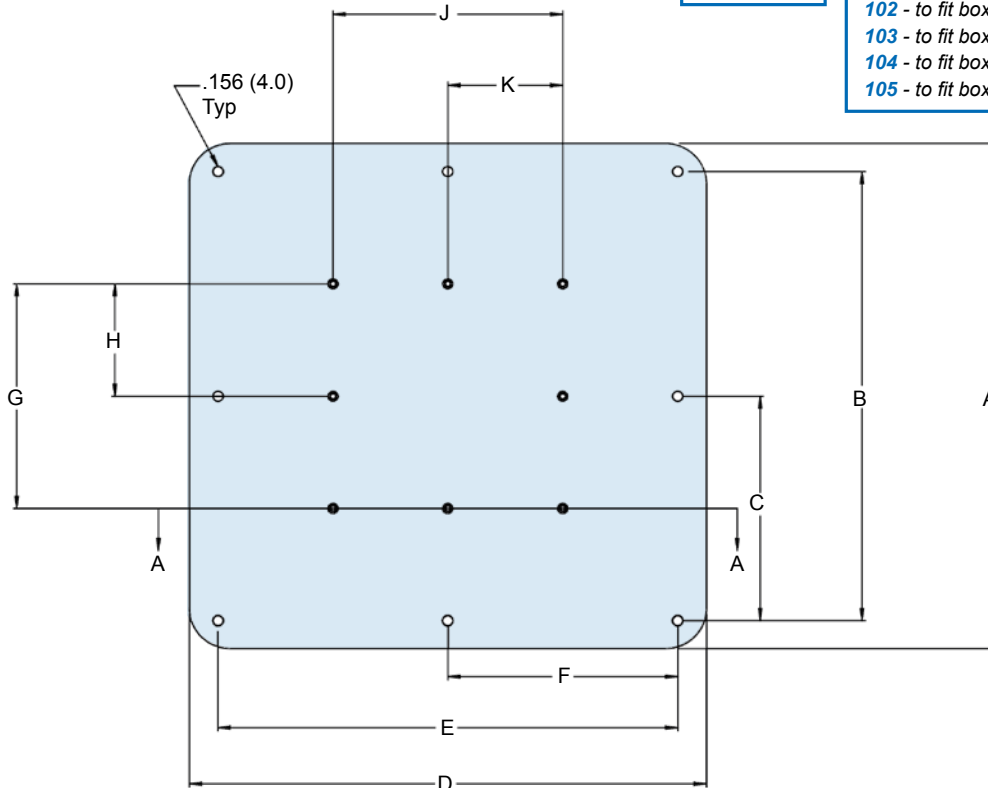
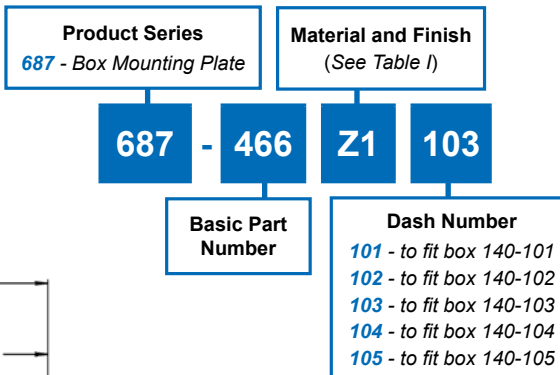
E

TABLE II

Symbol	Finish Description
XB	No Plating - Black Color (Non-Conductive Finish)
XM	2000 Hour Corrosion Resistant Electroless Nickel
XMT	2000 Hour Corrosion Resistant Ni-PTFE, Nickel-Fluorocarbon Polymer. <i>1000 Hour Grey™</i>
XO	No Plating - Brown Color (Non-Conductive Finish)
XW	2000 Hour Corrosion Resistant Cadmium/Olive Drab over Electroless Nickel

687-466 Terminal Rail and Block Mounting Plate To Fit Rectangular Boxes

Finish	Material	Finish Description
M	Aluminum Alloy	Electroless Nickel
Z1	Stainless Steel	Passivate



Section A - A

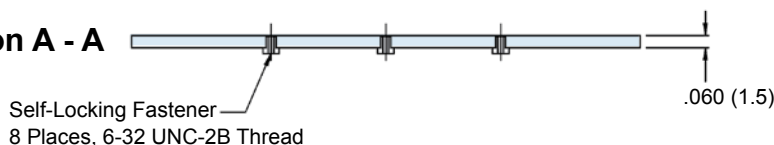


TABLE II: KEY DIMENSIONS

Dash No.	A Dim	B Dim	C Dim	D Dim	E Dim	F Dim	G Dim	H Dim	J Dim	K Dim
101	3.890 (98.8)	3.000 (76.2)	N/A	4.680 (118.9)	4.000 (101.6)	N/A	1.800 (45.7)	.900 (22.9)	2.500 (63.5)	1.250 (31.8)
102	4.650 (118.1)	4.000 (101.6)	N/A	5.500 (139.7)	5.000 (127.0)	N/A	3.160 (80.3)	1.580 (40.1)	3.160 (80.3)	1.580 (40.1)
103	7.870 (199.9)	7.000 (177.8)	3.500 (88.9)	7.870 (199.9)	7.000 (177.8)	3.500 (88.9)	3.980 (101.1)	1.990 (50.5)	3.980 (101.1)	1.990 (50.5)
104	4.650 (118.1)	3.750 (95.3)	N/A	4.650 (118.1)	3.750 (95.3)	N/A	2.330 (59.2)	1.160 (29.5)	2.330 (59.2)	1.160 (29.5)
105	4.500 (114.3)	3.150 (80.0)	N/A	5.750 (146.1)	3.740 (95.0)	N/A	3.160 (80.3)	1.580 (40.1)	3.160 (80.3)	1.580 (40.1)
107	7.688 (195.3)	7.000 (177.8)	3.500 (88.9)	10.188 (258.8)	9.500 (241.3)	3.750 (95.3) / 5.75 (146.1)	—	—	—	—

Metric Dimensions (mm) are in parentheses and are for reference only

687-305-22 Round Internal Mounting Plate To Fit Three-Legged Boxes



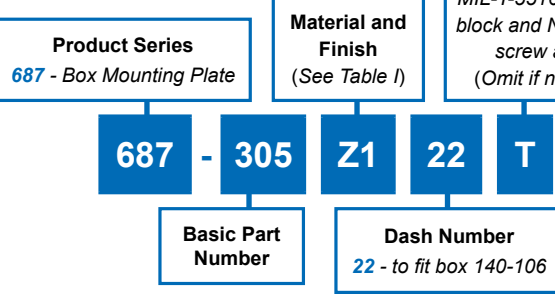
Composite
Junction
Boxes

TABLE I: MATERIALS AND FINISH

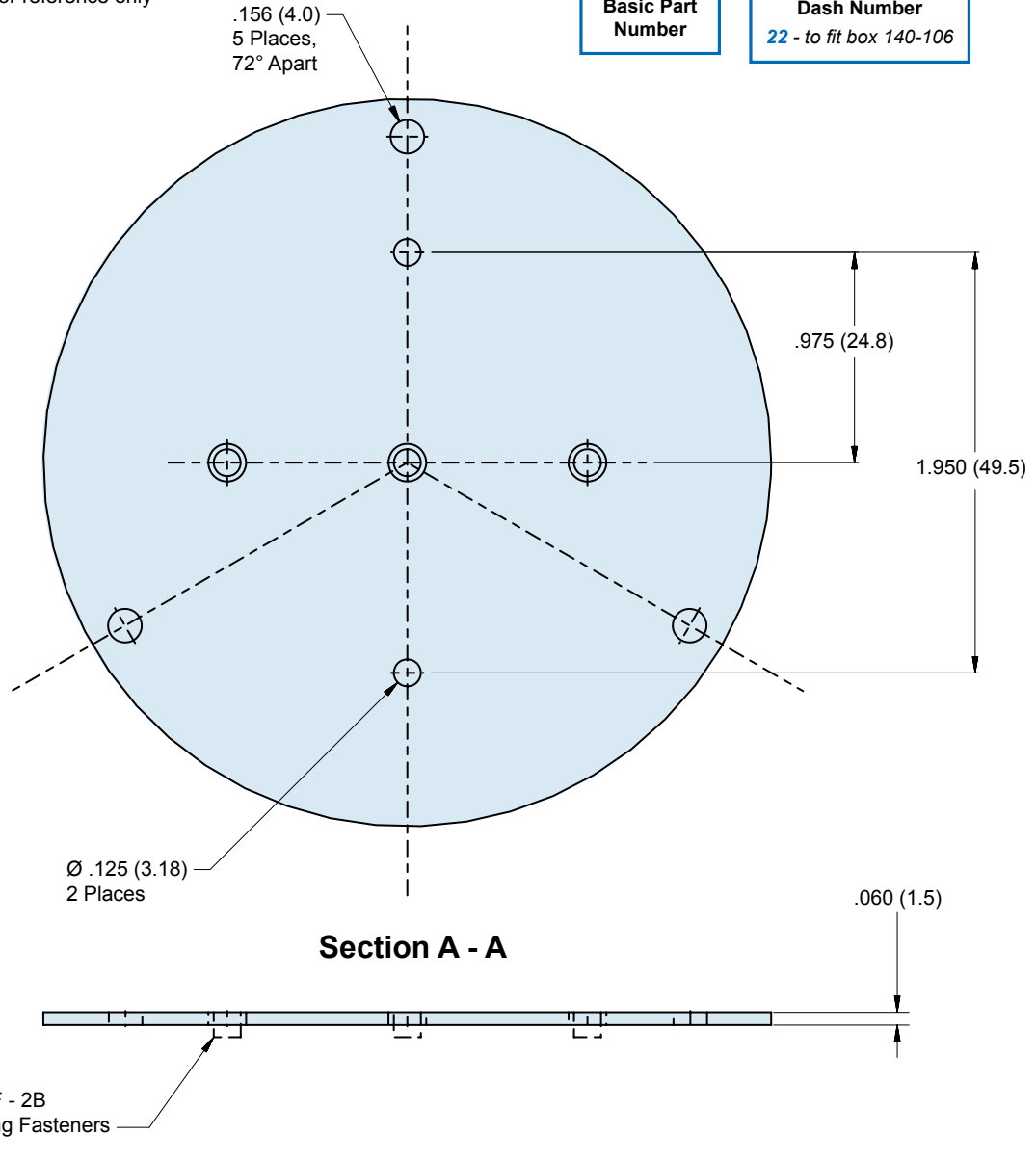
Finish	Material	Finish Description
M	Aluminum Alloy	Electroless Nickel
Z1	Stainless Steel	Passivate

Terminal Block Option

T - Plate supplied with MIL-T-55164/15 terminal block and NAS720C6-12 screw assembly (Omit if not required)



Metric Dimensions (mm) are in parentheses and are for reference only



687-467 Slotted Terminal Block Mounting Rail

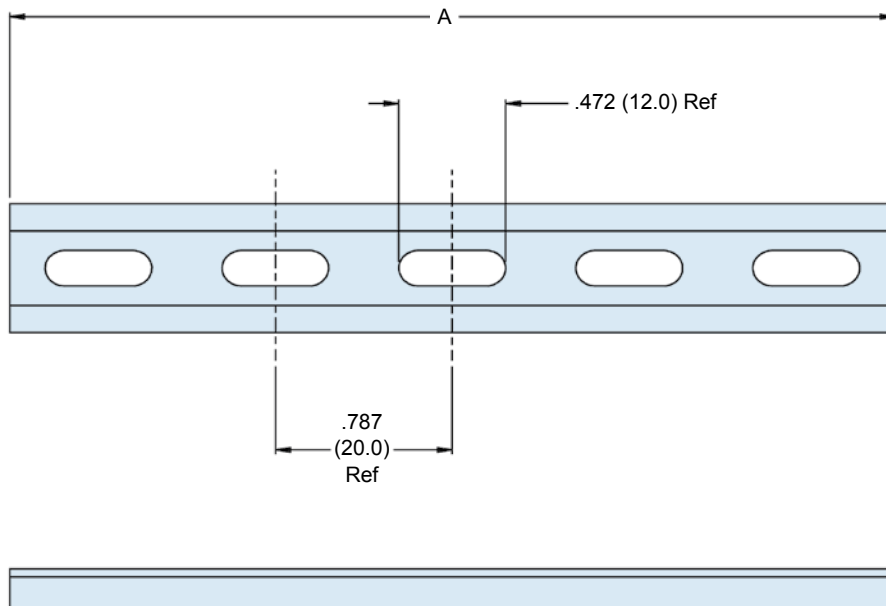
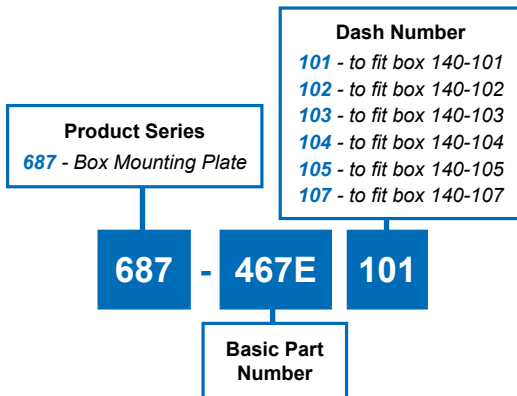


TABLE I: MATERIAL AND FINISH

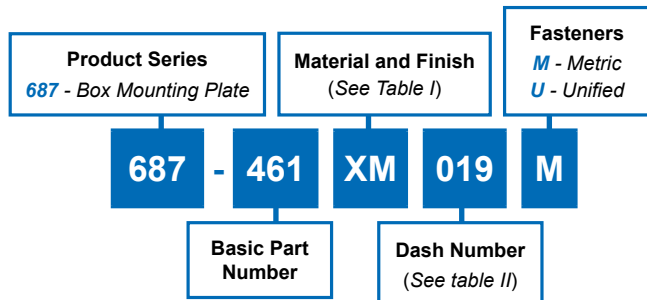
Finish	Material	Finish Description
E	Aluminum Alloy	Iridite

TABLE II: DIMENSIONS

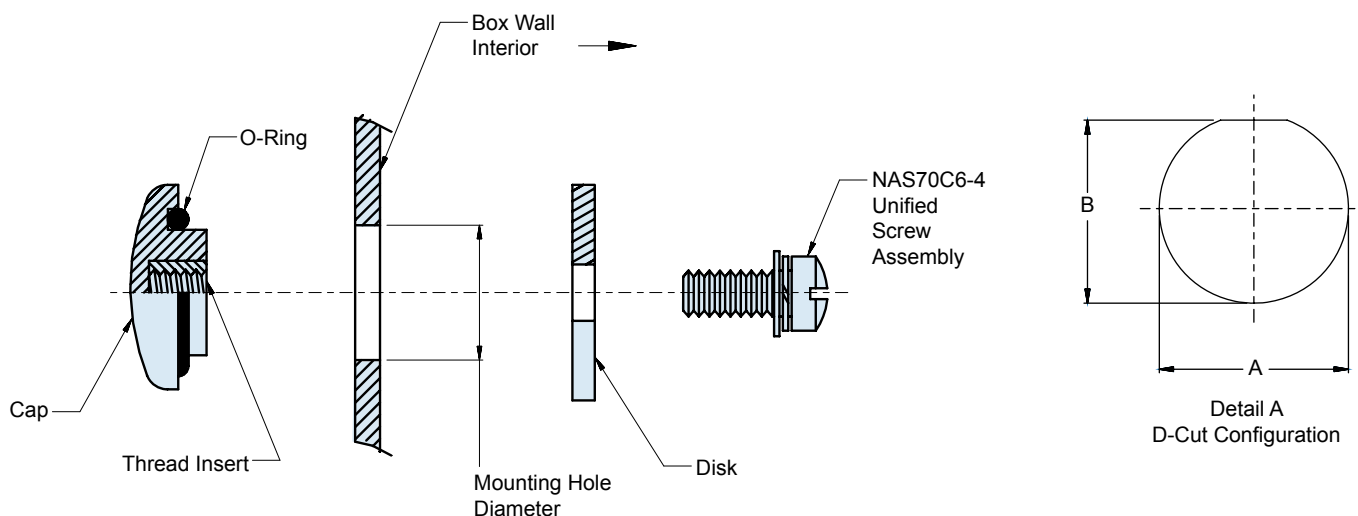
Dash No.	A ± .040 (1.000)	Use with Box	Use with Mounting Plate
101	3.750 (95.5)	140-101	687-466-101
102	4.620 (117.3)	140-102	687-466-102
103	6.249 (158.5)	140-103	687-466-103
104	4.650 (118.2)	140-104	687-466-104
105	4.500 (114.3)	140-105	687-466-105
106	2.500 (63.5)	140-106	687-305-22
107	TBD	140-107	687-466-107

Metric Dimensions (mm) are in parentheses and are for reference only

687-461 Hole Cap Assembly



Dash Number	A Mounting Hole Dia.	D Dim.	Thread Size, Box Components, Ref.	
016	.646	N/A	M16	5/8
017	.725	N/A	M18	
018	.765	N/A		3/4
019	.802	N/A	M20	
020	.890	N/A		7/8
021	.945	N/A		15/16
022	1.015	N/A		1.0
023	1.077	N/A	M27	
027	1.328	N/A		15/16
028	1.203	N/A	M30	13/16
029	1.438	N/A	M36	
030	.640	.595	See Detail A	
031	1.000	.968	See Detail A	
032	.755	.691	See Detail A	



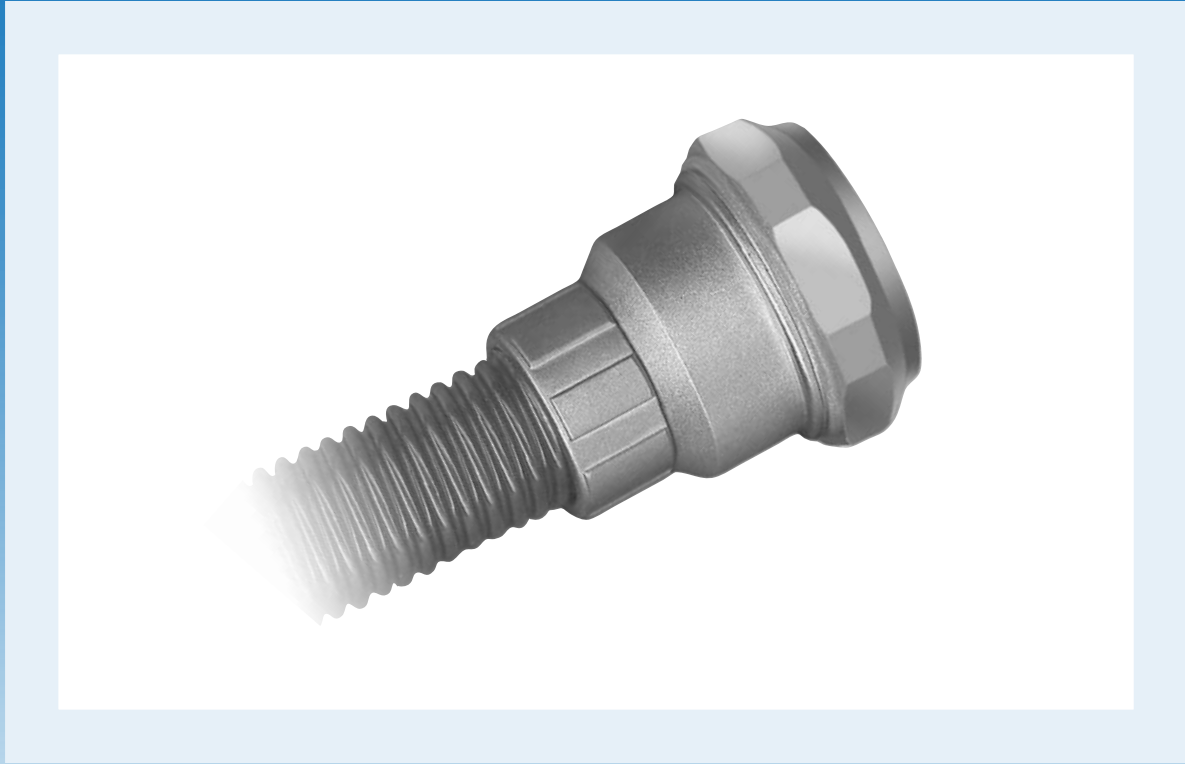
Symbol	Material	Finish Description
XO	PEI 30% Glass Filled Composite Thermoplastic	No Plating – Color Light Grey (Non-Conductive Finish)
XB		No Plating – Color Black (Non-Conductive Finish)
XM		Conductive – Electroless Nickel
XZN		Conductive – Zinc Nickel, Black

Dash No.	Mounting Hole Dia.
016	.646 (16.4)
017	.725 (18.4)
018	.765 (19.4)
019	.802 (20.4)
020	.890 (22.6)
022	1.015 (25.8)
023	1.077 (27.4)
027	1.328 (33.7)
029	1.438 (36.5)

Metric Dimensions (mm) are in parentheses and are for reference only



A New Way to Make Ends Meet



Glenair G-Load Coupling

For most applications, our standard self-locking coupling nuts with their familiar clicking action are a sure bet. But for situations where a helping hand is required to ensure the backshell coupling nut is tightened securely against connector interlocking teeth, Glenair is proud to offer our patented G-Load Coupler.

G-Load Coupling uses concentrically formed spring arms to push the backshell against the connector—aligning and seating the teeth and eliminating part loosening problems. The secret is in the G-Load patented low-torque performance: The G-Load Coupler actually

becomes tighter as the coupling reaches its final, full-thread engagement. And the G-Load Coupler remains tight even at low torque levels—eliminating vibration-related decoupling problems. Best of all, the G-Load Coupler can be installed again and again to full torque without degrading performance. Naturally, the entire mechanism is made from composite materials to eliminate maintenance and reduce weight.

So, for that little extra peace of mind that comes from couplers that won't rattle loose, call the factory and enquire about the new G-Load Coupler from Glenair.



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Glenair Environmental Class MIL-DTL-38999 Type Connectors in Composite Thermoplastic are Built for a Broad Range of Harsh-Environment Applications

Product Applications

Glenair is recognized as trusted supplier of harsh environment electrical connectors built to the MIL-DTL-38999 standard. This section of the catalog presents a selection of the environmental class MIL-DTL-38999 Series III type solutions produced by Glenair in composite thermoplastic.

Available Insert Arrangements

Based on industry-standard specifications, Glenair's MIL-DTL-38999 derivative environmental class connectors are supplied with insert arrangements IAW MIL-STD-1560, or appropriate sub-sets depending on connector series. Consult factory for available insert arrangements.

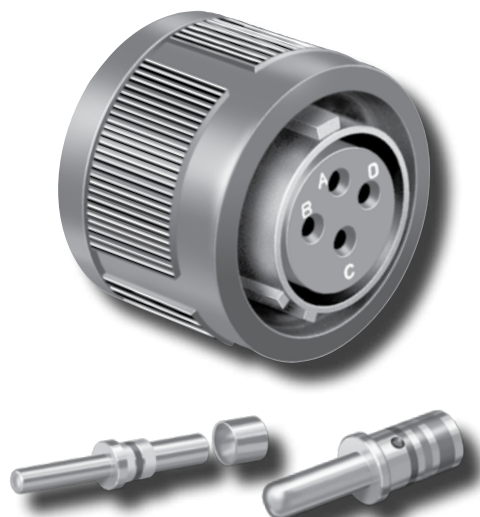
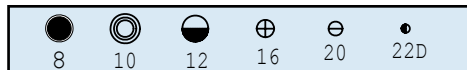
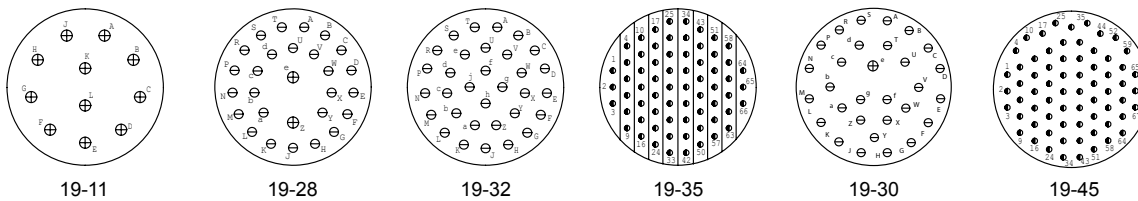
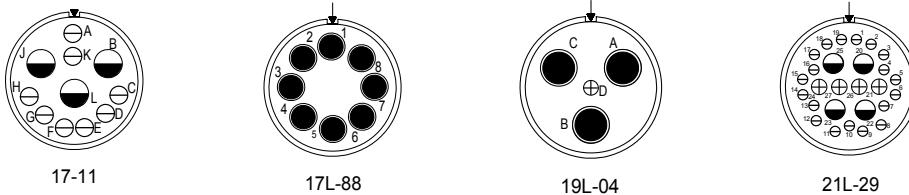
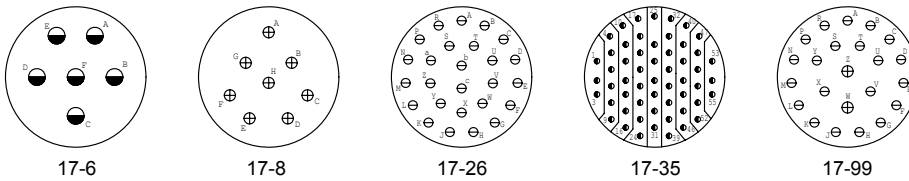
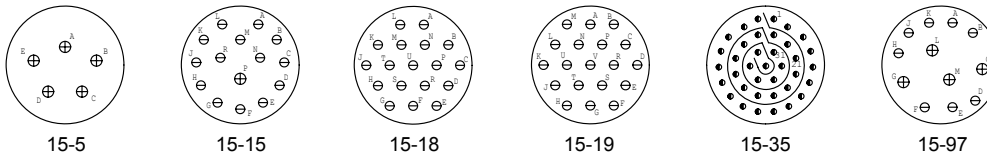
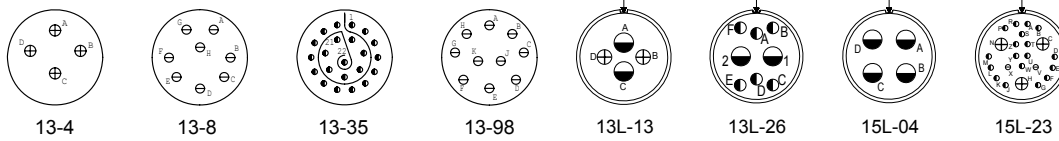
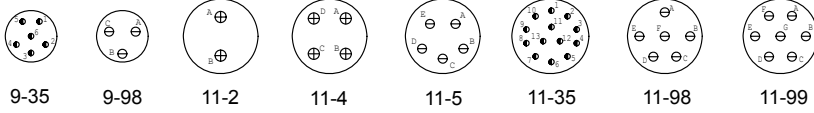


TABLE I: MATERIALS

Shell, Barrel, and Coupling Nut	30% glass filled Ultem® Composite Thermoplastic
Front and Rear Insulators	Glass-filled LCP in accordance with MIL-M-24519, Type GLP-30F
Contact Retention Clip	Beryllium copper, heat-treated, unplated
Grommet, Peripheral Seal and Interfacial Seal	Blended elastomer, 30% silicone per ZZ-R-765, 70% fluorosilicone per MIL-R-25988
Pin / Socket Contacts (Environmental)	Copper Alloy / Gold Plate - per M39029 / AS39029
Adhesives	Silicone and epoxy
Potting Compound: PCB and Solder Cup	High-strength epoxy, Hysol EE4215.

TABLE II: POPULAR ENVIRONMENTAL CLASS CONNECTOR FINISHES

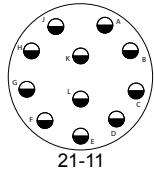
Plating Code	Material	Finish	Specification
XM	Composite	Electroless Nickel	AMS-C-26074
XMT	Composite	Ni-PTFE <i>1000 Hour Grey™</i> (Nickel Fluorocarbon Polymer)	MIL-DTL-38999L (2000 Hour Salt Spray)
XW	Composite	Cadmium Olive Drab over Electroless Nickel	AMS-QQ-P-416, over AMS-C-26074 (1000 Hour Salt Spray)



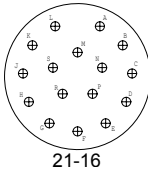
Consult factory for available insert arrangements.



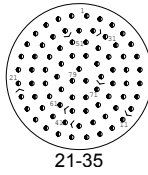
MIL-DTL-38999 Series III Type
Environmental Class Connectors
Insert Arrangements (IAW MIL-STD-1560 and JSFD08)



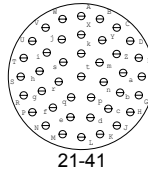
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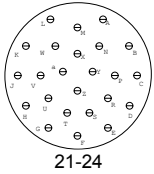
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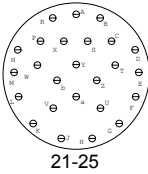
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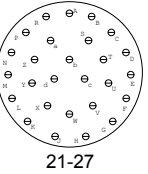
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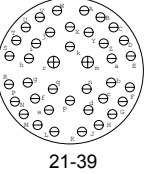
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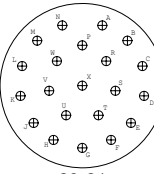
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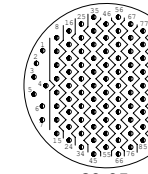
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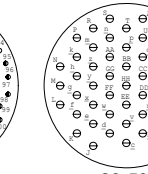
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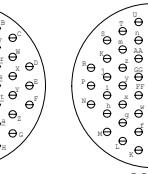
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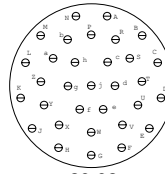
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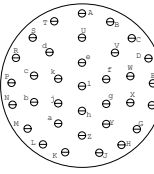
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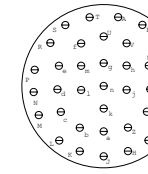
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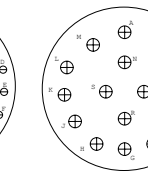
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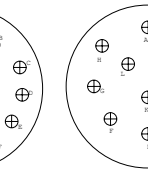
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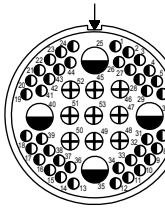
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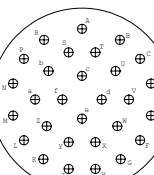
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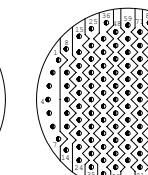
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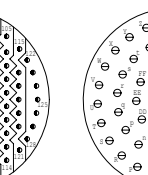
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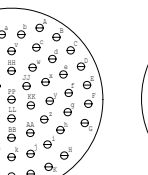
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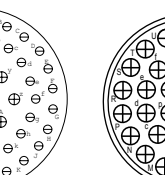
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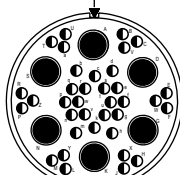
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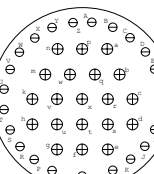
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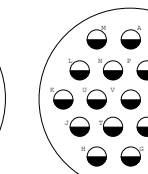
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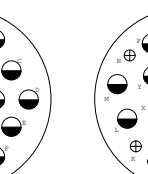
25C-17



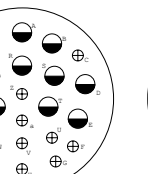
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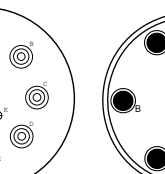
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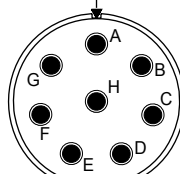
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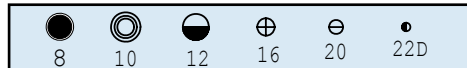
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25L-7



25Q-08



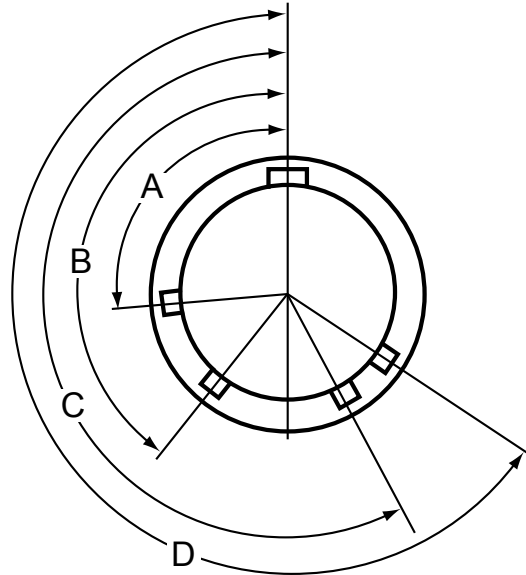
Consult factory for available insert arrangements.



Shell Polarization Table: Receptacle Face

Shell Size Code	Shell Size	Keyway	A°	B°	C°	D°
A	09	N	105	140	215	265
		A	102	102	248	320
		B	80	80	230	312
		C	35	35	205	275
		D	64	64	234	304
B C D	11 13 15	N	95	95	208	236
		A	113	113	182	292
		B	90	90	195	252
		C	53	53	220	255
		D	119	119	176	298
E F	17 19	N	80	142	196	293
		A	135	170	200	310
		B	49	169	200	244
		C	66	140	200	257
		D	62	145	180	280
G H J	21 23 25	N	80	142	196	293
		A	135	170	200	310
		B	49	169	200	244
		C	66	140	200	257
		D	62	145	180	280
E	79	153	197	272		

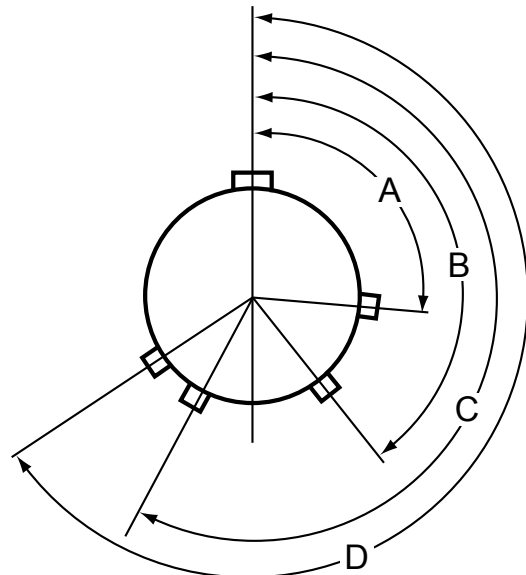
Receptacle View



Shell Polarization Table: Plug Face

Shell Size Code	Shell Size	Keyway	A°	B°	C°	D°
A	09	N	105	140	215	265
		A	102	132	248	320
		B	80	118	230	312
		C	35	140	205	275
		D	64	155	234	304
B C D	11 13 15	N	95	141	208	236
		A	113	156	182	292
		B	90	145	195	252
		C	53	156	220	255
		D	119	146	176	298
E F	17 19	N	80	142	196	293
		A	135	170	200	310
		B	49	169	200	244
		C	66	140	200	257
		D	62	145	180	280
G H J	21 23 25	N	80	196	196	293
		A	135	200	200	310
		B	49	200	200	244
		C	66	200	200	257
		D	62	180	180	280
E	79	197	197	272		

Plug View



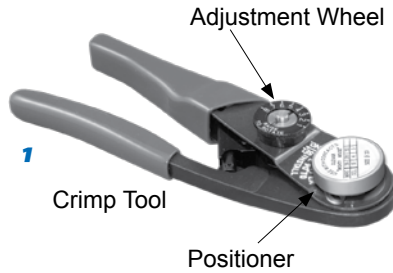
F

Crimp Contact Termination Instructions



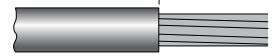
How To Terminate, Install and Remove Crimp Contacts

1 Set Up Series M22520 Crimp Tool. See pin and socket contact selection guide for correct tools based on contact part numbers and tool codes. Install proper positioner into crimp tool. The label on the positioner shows the proper tool setting for each wire size. Turn the adjustment wheel to the correct setting.



For Wire Sizes 22, 22M, 22D

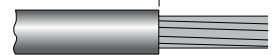
1/8" - 5/32"
(3.2 - 3.9)



2

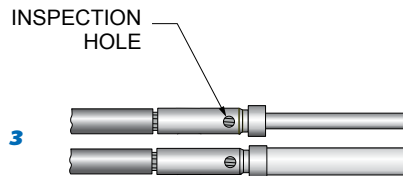
For Wire Sizes 10, 12, 16, 20

7/32" - 1/4"
(5.6 - 6.4)



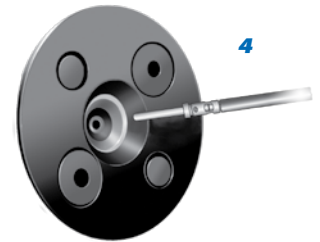
2 Strip Wire. Remove wire insulation, taking care to avoid nicking or cutting wire strands. Strip wire to length shown. Holding wire by insulation, twist strands together to form a neat bundle.

3 Insert wire into contact. The wire should be visible in the inspection hole.



3

4 Insert wire and contact into crimp tool as shown. Make sure that the contact is fully inserted into the tool. Squeeze handle completely. The ratchet mechanism will not allow a partial crimp. Release handle and remove contact.



4

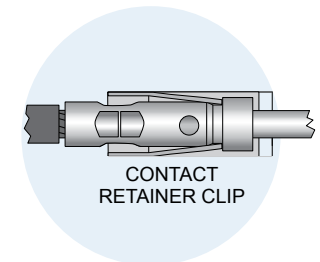
5 Inspect crimped contact. Wire should be fully inserted and the crimp should be uniform in appearance.



5

6 Install contact into connector. Slide colored end of insertion/extraction tool over wire insulation and slide the tool forward until it bottoms against the contact shoulder. Insert tool/contact/wire into contact cavity, being careful to avoid damage by properly aligning the contact with the cavity. Push forward until contact retention clip snaps into position. Remove tool. Gently pull on wire to confirm contact retention. Fill unused contact cavities with uncrimped contacts followed by the proper MS27488 sealing plug. For potted cable applications, install crimped-wire contacts in all unused cavities and terminate tail-end to a SAE-AS25274 cap.

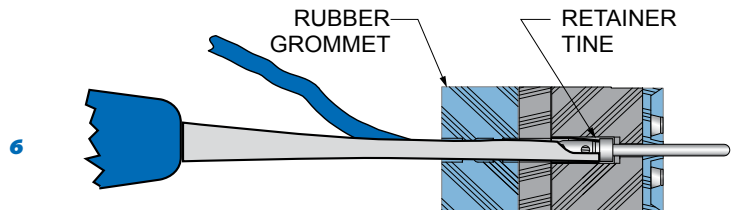
Contact Size	Wire Diameters (Inches)*	
	Min	Max
10	0.135	0.016
12	0.097	0.142
16	0.065	0.109
20	0.040	0.077
22	0.034	0.060
22M, 22D	0.030	0.060



CONTACT RETAINER CLIP

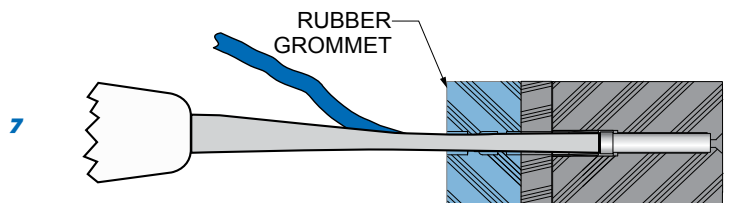
*The min diameters are to ensure proper sealing. The max diameters are to allow the use of removal tools.

Contact Size	Seal Plug	Cap
10	AS84049/81-10	AS25474-4
12	MS27488-12	AS25474-4
16	MS27488-16	AS25474-3
20	MS27488-20	AS25474-2
22, 22M, 22D	MS27488-22	N/A



6

7 Contact Extraction. Use the white end of appropriate insertion/extraction tool. First, push the wire into the groove of the extraction tool's tip. Slide the tip of the tool over the jacketed wire into the connector cavity. Push the tool until the tip bottoms in the connector. A straight push is best. Avoid wiggling or rocking the tip, as this may damage the cavity. Pinch the wire between your thumb and the white plastic grip and slide the tool and contact out of the connector.



7

Crimp Tool And Positioner For #12 and #16 Power Contacts



1 Crimp tool for use with size #16 and #12 power pins. 9.75 inches OAL, 1.25 pounds. Use with M39029/57 and /58 contacts and 809-093 adapters.

2 Positioner for use with size #12 and #16 Power contacts.

Figure	Military Part Number	Daniels Part Number	Tool Code
1	M22520/1-01	AF8	A
2	M22520/1-04	TH163	B

Miniature Adjustable Crimp Tool for #12, #16, #20, #22D Signal Contacts

These crimp tools perform precision eight indent crimps for gas-tight wire terminations and excellent tensile strength. Adjustment wheel has 8 settings. Ratchet mechanism prevents improper crimps. Use with bayonet-type positioners. Check calibration with M22520/3 gages. Length is 6.75 inches, weight is approx. 10 oz.



1 Standard M22520/2-01 miniature crimper. Use with standard size #20 and #22D contacts and with M39029/76, /77 and /78 coaxial center contacts. Requires positioner, ordered separately.

Glenair Part Number	Military Part Number	Daniels Part Number	Tool Code
809-015	M22520/2-01	AFM8	C

2 Positioner for M39029/76, 77 and 78 coaxial inner contact. Use with 809-015 crimp tool.



Coax/Power	Contact Size	Military Part Number	Daniels Part Number	Notes	Tool Code
Power	#20	M22520/2-10	K43	Series I, II, III and IV	D
Power	#22D	M22520/2-09	K42	Series I, II, III and IV Pin	E
Power	#22D	M22520/2-07	K40	Series I, III and IV Socket	F
Power	#22D	M22520/2-06	K41	Series II Socket	G
Coax	#16	M22520/2-35	K532-1	Series I, II, III and IV	H
Coax	#12	M22520/2-34	K323	Series I, II, III and IV	I
Quadrax	#24	M22520/2-37	K709	Quadrax Inner Contact	J

Parallel Action Crimp Tool and Hex Die Set



1 Parallel action tool for use with hex crimp dies. 11 inches OAL, 2.0 pounds. Anodized aluminum frame, steel mechanism, plastic handles. Includes tool for die set removal. Accepts all M22520/5 die sets.

2 Die set for terminating coaxial shield to outer contact. Use with size #12 matched impedance M39029/102 and 103 type coaxial contacts. Set consists of upper and lower halves. Made of hardened steel with black oxide finish. Approximately 2 inches in length, assembled. Die set has two closures per illustration.

Figure	Glenair Part Number	Military Part Number	Daniels Part Number	Tool Code
1	809-129	M22520/5-01	HX4	K
2	809-130	M22520/5-03	Y196	L
3	859-007	M22520/5-45	Y143	M

Crimp Tool And Positioner For #12 Coaxial Outer Contact



For crimping size #12 shield sleeves. These mil spec approved tools feature a ratchet mechanism to prevent damage from overcrimping. Check calibration with M22520/3 gage.

1 Crimp tool for use with size #12 coaxial contacts. Black handles. 9.75 inches OAL, 1.25 pounds.

2 Positioner for use with size #12 coaxial contacts. Use with 809-133 (M22520/31-01) crimp tool.

Figure	Glenair Part Number	Military Part Number	Daniels Part Number	Tool Code
1	809-133	M22520/31-01	GS200-1	N
2	809-134	M22520/31-02	G2P330	P

Crimp Tool And Positioner For #16 Coaxial Outer Contact



For crimping size #16 shield sleeves. These mil spec approved tools feature a ratchet mechanism to prevent damage from overcrimping. Check calibration with M22520/3 gage.

1 Crimp tool for use with size #16 coaxial contacts. Blue handles. 9.75 inches OAL, 1.25 pounds.

2 Positioner for use with size #16 coaxial contacts. Use with 809-127 (M22520/4-01) crimp tool.

Figure	Glenair Part Number	Military Part Number	Daniels Part Number	Tool Code
1	809-127	M22520/4-01	GS100-1	Q
2	809-126	M22520/4-02	GP295	R



MIL-DTL-38999 Series III Pin Contact Selection Guide

AS39029 Pin Contacts										
38999 Series III Type	Contact Size	Type	Glenair Part Number	Military Part Number	Color Bands			BIN	Wire Size	Tool Code
					1st	2nd	3rd			
F	#10	S	850-002-10-528	M39029/58-528	GREEN	RED	GREY	528	#10 - #12	Consult Factory
		E	850-007-10-624	M39029/107-624	BLUE	RED	YELLOW	624		
	#12	S	850-002-12-365	M39029/58-365	ORANGE	BLUE	GREEN	365	#12 - #14	A, B
		E	850-007-12-623	M39029/107-623	BLUE	RED	ORANGE	623		
		C	852-002-12-211	M39029/28-211	RED	BROWN	BROWN	211	RG174 RG179 RG316	C, I (inner)
		C	852-002-12-409	M39029/28-409	YELLOW	BLACK	WHITE	409	RG180	N, P (outer)
	#16	S	850-002-16-364	M39029/58-364	ORANGE	BLUE	YELLOW	364	#16 - #20	A, B
		E	850-007-16-622	M39029/58-622	BLUE	RED	RED	622		
		C	852-008-16-424	M39029/76-424	YELLOW	RED	YELLOW	424	RG174 RG179 RG316	C, H (inner)
		C	852-008-16-425	M39029/76-425	YELLOW	RED	GREEN	425	RG178	Q, R (outer)
	#20	S	850-002-20-363	M39029/58-363	ORANGE	BLUE	ORANGE	363	#20 - #24	C, D
		E	850-007-20-621	M39029/107-621	BLUE	RED	BROWN	621		
#22D	S	850-002-22-360	M39029/58-360	ORANGE	BLUE	BLACK	360	#22 - #28	C, E	
	E	850-007-22-620	M39029/107-620	BLUE	RED	black	620			

Type	Crimp Style
S	Standard-Duty Crimp
E	Extended-Duty Crimp
C	Coaxial Crimp

BIN Color Coding									
0	1	2	3	4	5	6	7	8	9
BLACK	BROWN	RED	ORANGE	YELLOW	GREEN	BLUE	VIOLET	GREY	WHITE

MIL-DTL-38999 Series III Socket Contact Selection Guide



AS39029 Socket Contacts										
Contact Size	Type	Glenair Part Number	Military Part Number	Color Bands			BIN	Wire Size	Tool Code	
				1st	2nd	3rd				
#10	S	850-001-10-527	M39029/56-527	GREEN	RED	VIOLET	527	#10 - #12	Consult Factory	
	E	850-006-10-618	M39029/106-618	BLUE	BROWN	GREY	618			
#12	S	850-001-12-353	M39029/56-353	ORANGE	GREEN	ORANGE	353	#12 - #14	A, B	
	E	850-006-12-617	M39029/106-617	BLUE	BROWN	VIOLET	617			
	C	852-003-12-416	M39029/75-416	YELLOW	BROWN	BLUE	416	RG174 RG179 RG316	C, I (inner)	
	C	852-003-12-417	M39029/75-417	YELLOW	BROWN	VIOLET	417	RG180	N, P (outer)	
#16	S	850-001-16-352	M39029/56-352	ORANGE	GREEN	RED	352	#16 - #20	A, B	
	E	850-006-16-616	M39029/106-616	BLUE	BROWN	BLUE	616			
	C	852-009-16-428	M39029/77-428	YELLOW	RED	GREY	428	RG174 RG179 RG316	C, H (inner)	
	C	852-009-16-429	M39029/77-429	YELLOW	RED	WHITE	429	RG178	Q, R (outer)	
#20	S	850-001-20-351	M39029/56-351	ORANGE	GREEN	BROWN	351	#20 - #24	C, D	
	E	850-006-20-615	M39029/106-615	BLUE	BROWN	GREEN	615			
#22D	S	850-001-22-348	M39029/56-348	ORANGE	YELLOW	GREY	348	#22 - #28	C, F	
	E	850-006-22-614	M39029/106-614	BLUE	BROWN	YELLOW	614			

Type	Crimp Style
S	Standard-Duty Crimp
E	Extended-Duty Crimp
C	Coaxial Crimp

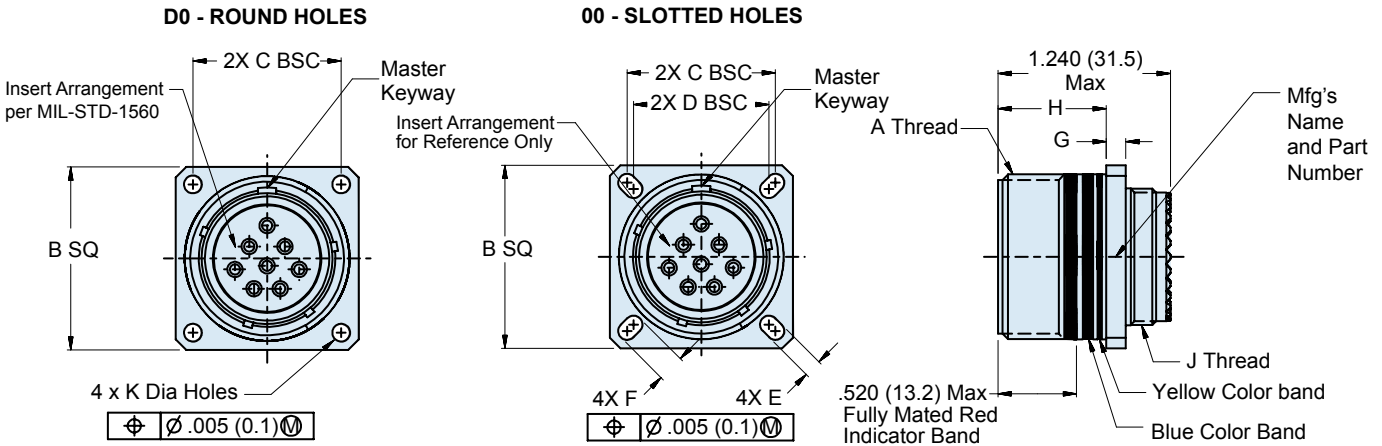
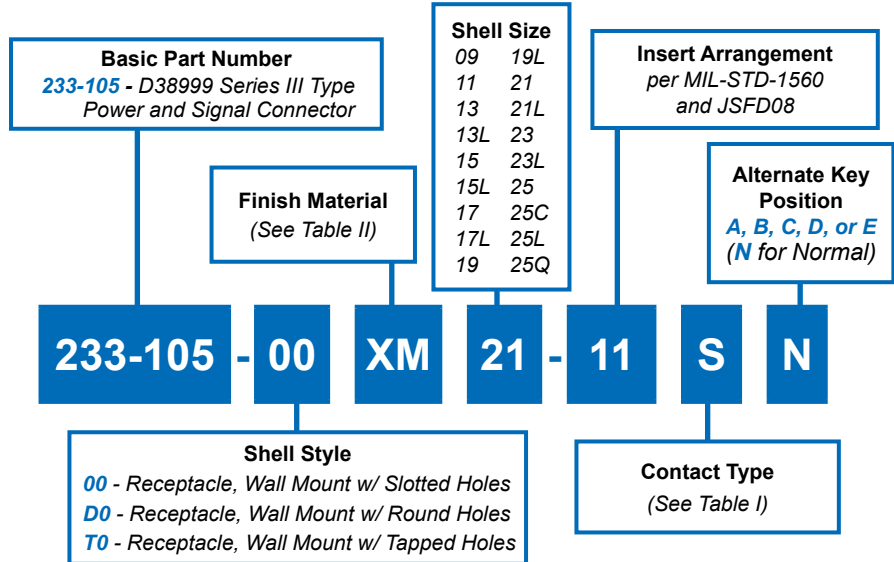
BIN Color Coding									
0	1	2	3	4	5	6	7	8	9
BLACK	BROWN	RED	ORANGE	YELLOW	GREEN	BLUE	VIOLET	GREY	WHITE





233-105-00, D0 and T0 MIL-DTL-38999 Series III Type Wall Mount Environmental Receptacle Connector

TABLE II: FINISH		
SYM	MATERIAL	FINISH
XM	Composite	Electroless Nickel
XMT	Composite	Ni-PTFE 1000 Hour Grey™
XW	Composite	Cadmium O.D. Over Electroless Nickel



Consult factory for available insert arrangements.
Metric Dimensions in Parenthesis.

TABLE I: CONTACT TYPES				
Ordering Code	Assembly Dash Number	Wire Size	Type	Military Part Number
P	850-002-16-364	#16 - #20	Pin	M39029/58-364
S	850-001-16-352	#16 - #20	Socket	M39029/56-352
A	Less pin contacts			
B	Less socket contacts			

233-105-00, D0 and T0
MIL-DTL-38999 Series III Type
Wall Mount Environmental Receptacle Connector

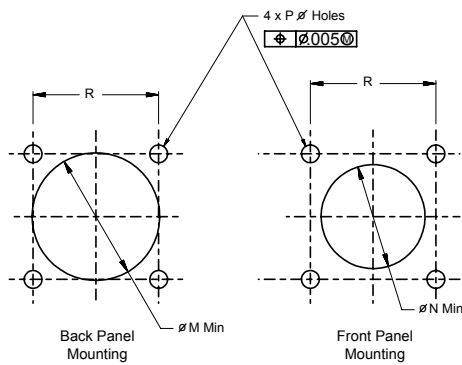


TABLE III: SHELL SIZE

Shell Size Code	Shell Size	A Thread	B SQ	C BSC	G	H	J Thread	K Holes Dia
A	09	.6250-.1P-.3L-TS-2A	.949 (24.1) .925 (23.5)	.719 (18.3)	.144 (3.7) .083 (2.1)	.823 (20.9) .768 (19.5)	M12 x 1.0-6g 0.100R	.136 (3.5) .120 (3.0)
B	11	.7500-.1P-.3L-TS-2A	1.043 (26.5) 1.019 (25.9)	.812 (20.6)	.144 (3.7) .083 (2.1)	.823 (20.9) .768 (19.5)	M15 x 1.0-6g 0.100R	.136 (3.5) .120 (3.0)
C	13	.8750-.1P-.3L-TS-2A	1.138 (28.9) 1.114 (28.3)	.906 (23.0)	.144 (3.7) .083 (2.1)	.823 (20.9) .768 (19.5)	M18 x 1.0-6g 0.100R	.136 (3.5) .120 (3.0)
D	15	1.0000-.1P-.3L-TS-2A	1.232 (31.3) 1.208 (30.7)	.969 (24.6)	.144 (3.7) .083 (2.1)	.823 (20.9) .768 (19.5)	M22 x 1.0-6g 0.100R	.136 (3.5) .120 (3.0)
E	17	1.1875-.1P-.3L-TS-2A	1.323 (33.6) 1.299 (33.0)	1.062 (27.0)	.144 (3.7) .083 (2.1)	.823 (20.9) .768 (19.5)	M25 x 1.0-6g 0.100R	.136 (3.5) .120 (3.0)
F	19	1.2500-.1P-.3L-TS-2A	1.449 (36.8) 1.425 (36.2)	1.156 (29.4)	.144 (3.7) .083 (2.1)	.823 (20.9) .768 (19.5)	M28 x 1.0-6g 0.100R	.136 (3.5) .120 (3.0)
G	21	1.3750-.1P-.3L-TS-2A	1.575 (40.0) 1.551 (39.4)	1.250 (31.8)	.171 (65.2) .083 (39.8)	.791 (20.0) .736 (18.7)	M31 x 1.0-6g 0.100R	.136 (3.5) .120 (3.0)
H	23	1.5000-.1P-.3L-TS-2A	1.701 (43.2) 1.677 (42.6)	1.375 (34.9)	.171 (65.2) .083 (39.8)	.791 (20.0) .736 (18.7)	M34 x 1.0-6g 0.100R	.162 (4.1) .146 (3.7)
J	25	1.6250-.1P-.3L-TS-2A	1.823 (46.3) 1.799 (45.7)	1.500 (38.1)	.171 (65.2) .083 (39.8)	.791 (20.0) .736 (18.7)	M37 x 1.0-6g 0.100R	.162 (4.1) .146 (3.7)

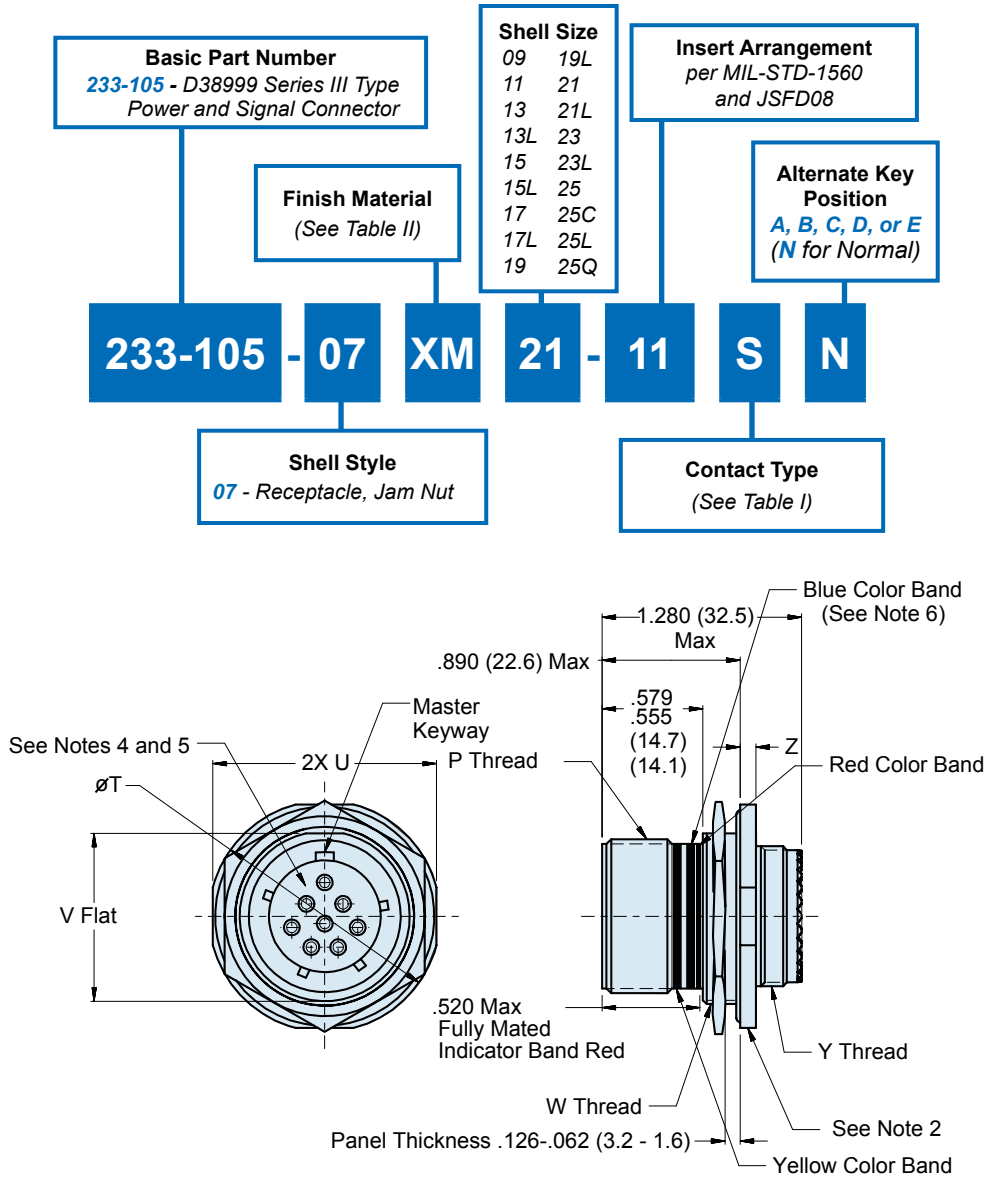
TABLE IV: PANEL CUTOUTS

Shell Size Code	Shell Size	M Ø Min	N Ø Min	P Ø Holes	R BSC
A	09	.656 (16.7)	.516 (13.1)	.133 (3.4) .123 (3.1)	.719 (18.3)
B	11	.796 (20.2)	.625 (15.9)	.133 (3.4) .123 (3.1)	.812 (20.6)
C	13	.922 (23.4)	.750 (19.1)	.133 (3.4) .123 (3.1)	.906 (23.0)
D	15	1.047 (26.6)	.906 (23.0)	.133 (3.4) .123 (3.1)	.969 (24.6)
E	17	1.219 (31.0)	1.016 (25.8)	.133 (3.4) .123 (3.1)	1.062 (27.0)
F	19	1.297 (32.9)	1.141 (29.0)	.133 (3.4) .123 (3.1)	1.156 (29.4)
G	21	1.422 (36.1)	1.266 (32.2)	.133 (3.4) .123 (3.1)	1.250 (31.8)
H	23	1.547 (39.3)	1.375 (34.9)	.159 (4.0) .149 (3.8)	1.375 (34.9)
J	25	1.672 (42.5)	1.484 (37.7)	.155 (3.9) .145 (3.7)	1.500 (38.1)





233-105-07 MIL-DTL-38999 Series III Type Jam Nut Environmental Receptacle Connector



Consult factory for available insert arrangements.

APPLICATION NOTES

1. Material/ Finishes:
Shells, Jam Nut - See Table II (Composite Jam Nut No Plating Required).
Insulators- High Grade Rigid Dielectric/ N.A
Seals- Fluorosilicone/ N.A.
2. Assembly to be identified with Glenair's name, part number and date code space permitting.
3. Modified major diameter 1.252-1.257 (31.80-31.95).
4. Insert arrangement in accordance with MIL-STD-1560.
5. Insert arrangement shown is for reference only.
6. Blue Color Band indicates rear release retention system.
7. 16# AWG contact arrangements only. See available arrangements opposite page.
8. Metric dimensions (mm) are in parentheses.

233-105-07
MIL-DTL-38999 Series III Type
Jam Nut Environmental Receptacle Connector

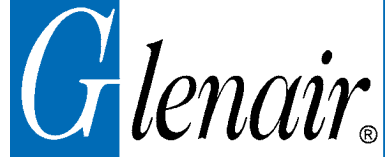
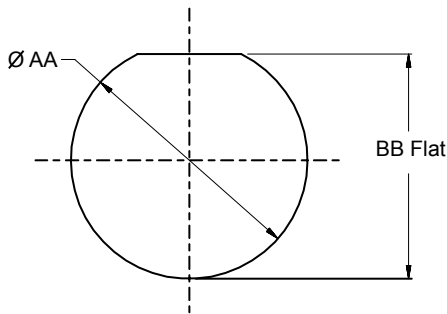


TABLE I: CONTACT TYPES

Ordering Code	Assembly Dash Number	Wire Size	Type	Military Part Number
P	850-002-16-364	#16 – #20	Pin	M39029/58-364
S	850-001-16-352	#16 – #20	Socket	M39029/56-352
A	Less pin contacts			
B	Less socket contacts			

TABLE IV: PANEL CUTOUT

Shell Size Code	Shell Size	AA Dia	BB Flat
A	09	.710 (18.0) .700 (17.8)	.670 (17.0) .660 (16.8)
B	11	.835 (21.2) .825 (21.0)	.771 (19.6) .761 (19.3)
C	13	1.020 (25.9) 1.010 (25.7)	.955 (24.3) .945 (24.0)
D	15	1.145 (29.1) 1.135 (28.8)	1.085 (27.6) 1.075 (27.3)
E	17	1.270 (32.3) 1.260 (32.0)	1.210 (30.7) 1.200 (30.5)
F	19	1.395 (35.4) 1.385 (35.2)	1.335 (33.9) 1.325 (33.7)
G	21	1.520 (38.6) 1.510 (38.4)	1.460 (37.1) 1.450 (36.8)
H	23	1.645 (41.8) 1.635 (41.5)	1.585 (40.3) 1.575 (40.0)
J	25	1.770 (45.0) 1.760 (44.7)	1.710 (43.4) 1.700 (43.2)



Recommended Cut-Out

TABLE II: FINISH

SYM	MATERIAL	FINISH
XM	Composite	Electroless Nickel
XMT	Composite	Ni-PTFE 1000 Hour Grey™
XW	Composite	Cadmium O.D. Over Electroless Nickel

*Consult Factory for Additional Plating Options

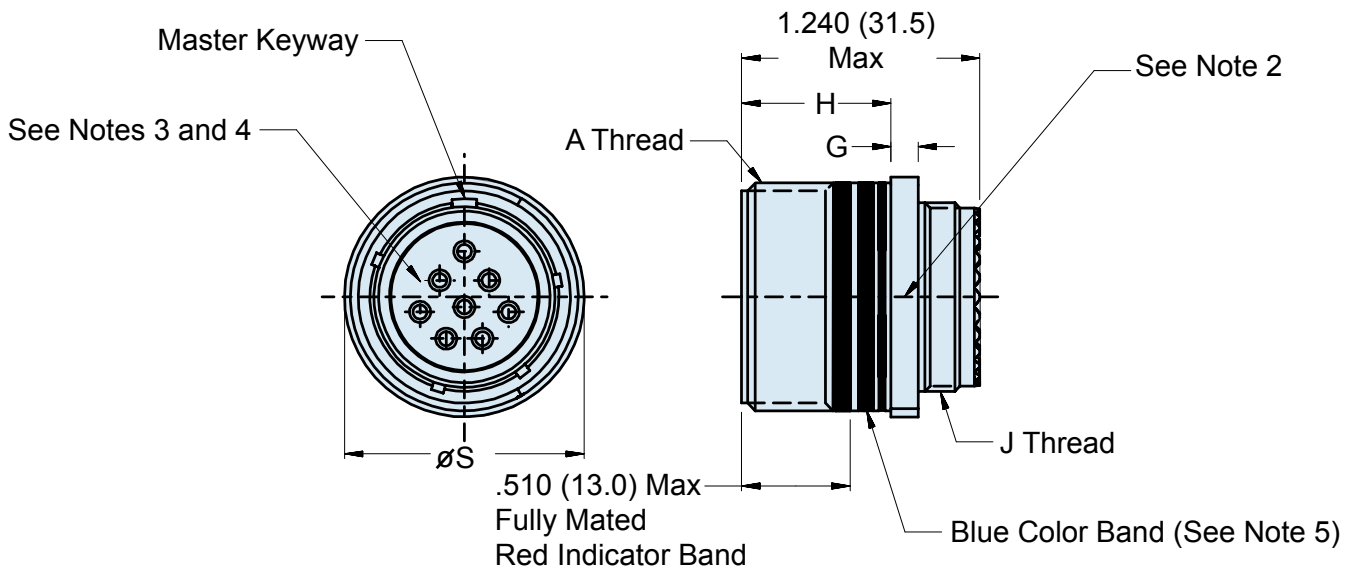
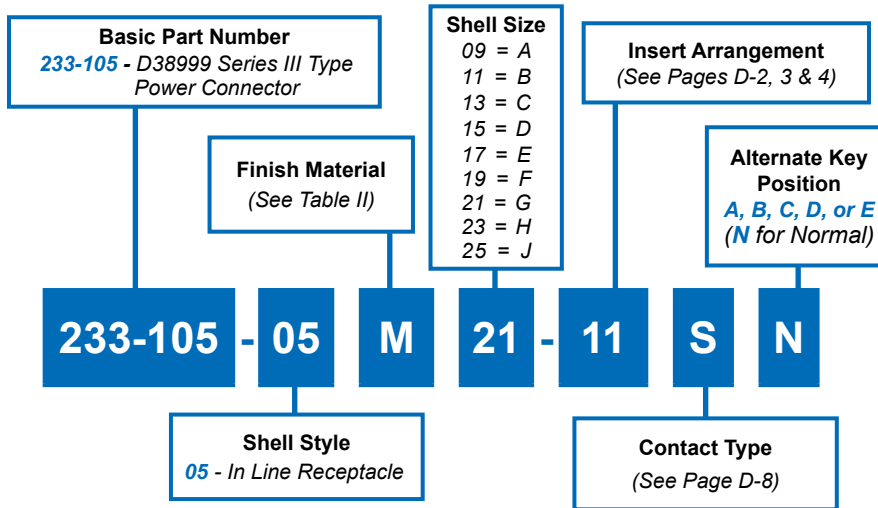
*See Note 3

TABLE III: SHELL SIZE

Shell Size Code	Shell Size	P Thread	T Dia	U	V	W Thread	Y Thread	Z
A	09	.6250-.1P-.3L-TS-2A	1.200 (30.5) 1.178 (29.9)	1.078 (27.4) 1.048 (26.6)	.654 (16.6) .645 (16.4)	M17 x 1.0-6G 0.100R	M12 x 1.0-6g 0.100R	.114 (2.9) .083 (2.1)
B	11	.7500-.1P-.3L-TS-2A	1.386 (35.2) 1.362 (34.6)	1.268 (32.2) 1.236 (31.4)	.755 (19.2) .745 (18.9)	M20 x 1.0-6g 0.100R	M15 x 1.0-6g 0.100R	.121 (3.1) .083 (2.1)
C	13	.8750-.1P-.3L-TS-2A	1.512 (38.4) 1.488 (37.8)	1.390 (35.3) 1.358 (34.5)	.942 (23.9) .932 (23.7)	M25 x 1.0-6g 0.100R	M18 x 1.0-6g 0.100R	.121 (3.1) .083 (2.1)
D	15	1.0000-.1P-.3L-TS-2A	1.638 (41.6) 1.614 (41.0)	1.516 (38.5) 1.484 (37.7)	1.066 (27.1) 1.056 (26.8)	M28 x 1.0-6g 0.100R	M22 x 1.0-6g 0.100R	.121 (3.1) .083 (2.1)
E	17	1.1875-.1P-.3L-TS-2A	1.764 (44.8) 1.740 (44.2)	1.642 (41.7) 1.610 (40.9)	1.191 (30.3) 1.181 (30.0)	M32 x 1.0-6g 0.100R*	M25 x 1.0-6g 0.100R	.121 (3.1) .083 (2.1)
F	19	1.2500-.1P-.3L-TS-2A	1.949 (49.5) 1.925 (48.9)	1.827 (46.4) 1.795 (45.6)	1.316 (33.4) 1.306 (33.2)	M35 x 1.0-6g 0.100R	M28 x 1.0-6g 0.100R	.154 (3.9) .114 (2.9)
G	21	1.3750-.1P-.3L-TS-2A	2.075 (52.7) 2.051 (52.1)	1.953 (49.6) 1.921 (48.8)	1.441 (36.6) 1.431 (36.3)	M38 x 1.0-6g 0.100R	M31 x 1.0-6g 0.100R	.154 (3.9) .114 (2.9)
H	23	1.5000-.1P-.3L-TS-2A	2.201 (55.9) 2.177 (55.3)	2.079 (52.8) 2.047 (52.0)	1.566 (39.8) 1.556 (39.5)	M41 x 1.0-6g 0.100R	M34 x 1.0-6g 0.100R	.154 (3.9) .114 (2.9)
J	25	1.6250-.1P-.3L-TS-2A	2.323 (59.0) 2.299 (58.4)	2.205 (56.0) 2.173 (55.2)	1.691 (43.0) 1.681 (42.7)	M44 x 1.0-6g 0.100R	M37 x 1.0-6g 0.100R	.154 (3.9) .114 (2.9)



233-105-05
MIL-DTL-38999 Series III Type
In-Line Environmental Receptacle Connector



Consult factory for available insert arrangements.

APPLICATION NOTES

- | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1. Material/ Finishes:
 Shells - See Table II
 Insulator- High Grade Rigid Dielectric/ N.A
 Seals- Fluorosilicone/ N.A.</p> | <p>3. Insert arrangement in accordance with MIL-STD-1560.
 4. Insert arrangement shown is for reference only.
 5. Blue Color Band indicates rear release retention system.
 7. Metric Dimensions (mm) are indicated in parentheses.</p> |
| <p>2. Assembly to be identified with Glenair's name, part number and date code space permitting.</p> | |

233-105-05
MIL-DTL-38999 Series III Type
In-Line Environmental Receptacle Connector



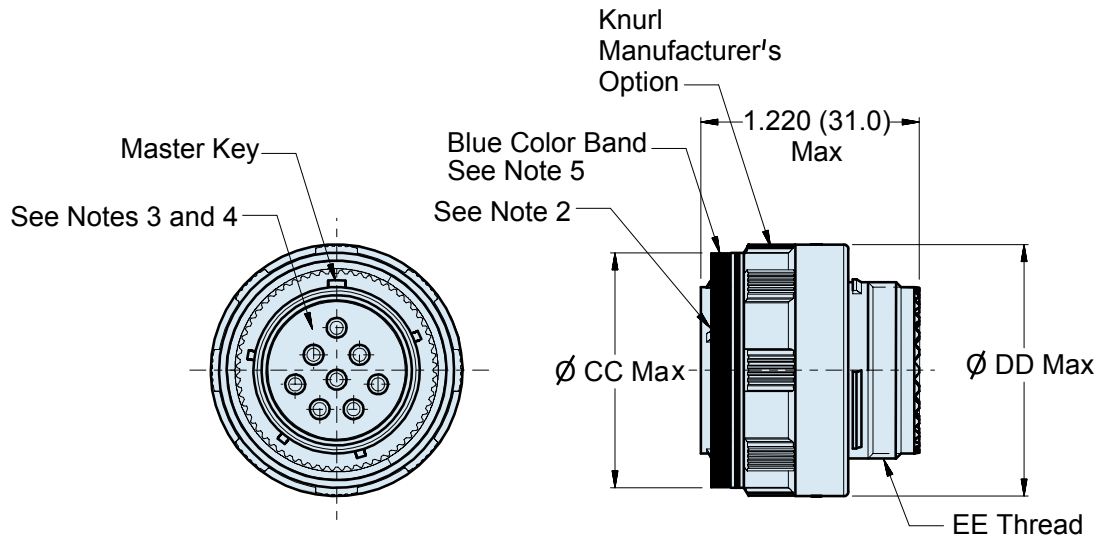
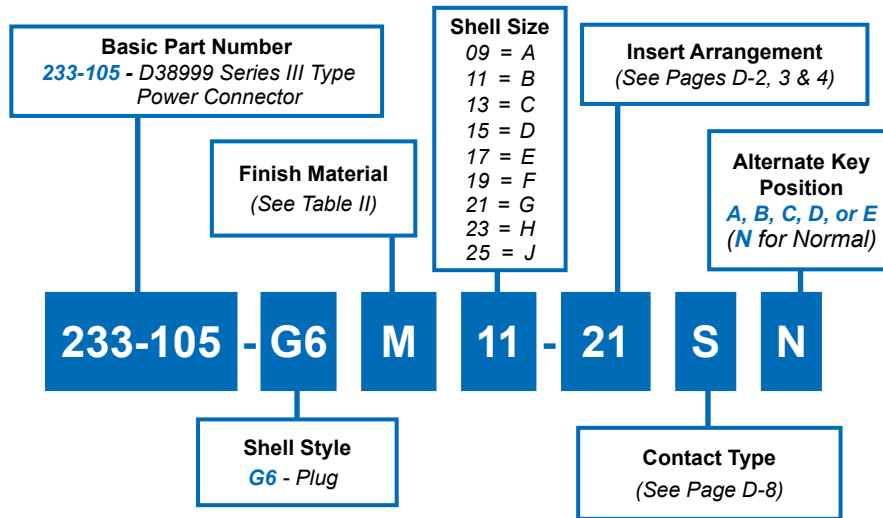
TABLE I: CONTACT TYPES				
Ordering Code	Assembly Dash Number	Wire Size	Type	Military Part Number
P	850-002-16-364	#16 – #20	Pin	M39029/58-364
S	850-001-16-352	#16 – #20	Socket	M39029/56-352
A	Less pin contacts			
B	Less socket contacts			

TABLE II: FINISH		
SYM	MATERIAL	FINISH
XM	Composite	Electroless Nickel
XMT	Composite	Ni-PTFE 1000 Hour Grey™
XW	Composite	Cadmium O.D. Over Electroless Nickel

*Consult Factory for Additional Plating Options

TABLE III: SHELL SIZE						
Shell Size Code	Shell Size	A Thread	G	H	S Dia	J Thread
A	09	.6250-.1P-.3L-TS-2A	.144 (3.7) .083 (2.1)	.823 (20.9) .768 (19.5)	.715 (18.2)	M12 x 1.0-6g 0.100R
B	11	.7500-.1P-.3L-TS-2A	.144 (3.7) .083 (2.1)	.823 (20.9) .768 (19.5)	.840 (21.3)	M15 x 1.0-6g 0.100R
C	13	.8750-.1P-.3L-TS-2A	.144 (3.7) .083 (2.1)	.823 (20.9) .768 (19.5)	.963 (24.5)	M18 x 1.0-6g 0.100R
D	15	1.0000-.1P-.3L-TS-2A	.144 (3.7) .083 (2.1)	.823 (20.9) .768 (19.5)	1.090 (27.7)	M22 x 1.0-6g 0.100R
E	17	1.1875-.1P-.3L-TS-2A	.144 (3.7) .083 (2.1)	.823 (20.9) .768 (19.5)	1.275 (32.4)	M25 x 1.0-6g 0.100R
F	19	1.2500-.1P-.3L-TS-2A	.144 (3.7) .083 (2.1)	.823 (20.9) .768 (19.5)	1.337 (34.0)	M28 x 1.0-6g 0.100R
G	21	1.3750-.1P-.3L-TS-2A	.171 (65.2) .083 (39.8)	.791 (20.0) .736 (18.7)	1.463 (37.2)	M31 x 1.0-6g 0.100R
H	23	1.5000-.1P-.3L-TS-2A	.171 (65.2) .083 (39.8)	.791 (20.0) .736 (18.7)	1.587 (40.3)	M34 x 1.0-6g 0.100R
J	25	1.6250-.1P-.3L-TS-2A	.171 (65.2) .083 (39.8)	.791 (20.0) .736 (18.7)	1.713 (43.5)	M37 x 1.0-6g 0.100R





Consult factory for available insert arrangements.

APPLICATION NOTES

1. Material/ Finishes:
Barrel, Coupling Nut - See Table II
(Composite Coupling Nut - No Plating Required).
Insulators- High Grade Rigid Dielectric/ N.A
Seals- Fluorosilicone/ N.A.
2. Assembly to be identified with Glenair's name, part number and date code space permitting.
3. Insert arrangement in accordance with MIL-STD-1560.
4. Insert arrangement shown is for reference only.
5. Blue Color Band indicates rear release retention system.
7. Metric Dimensions (mm) are indicated in parentheses.

233-105-G6
MIL-DTL-38999 Series III Type
Environmental Plug Connector



TABLE II: FINISH			
SYM	MATERIAL	FINISH	MIL SYM
M	Aluminum	Electroless Nickel	F
NF		Cadmium O.D. Over Electroless Nickel	W
ZN		Zinc Ni, Olive Drab	Z
ZE		Zinc Ni, No Chromate	
ZR		Zinc Ni, Black (Tri-Valent CR)	
AL		Pure-Dense Electro-Deposited Aluminum	P
MT		Ni-PTFE 1000 Hour Grey™	T
XM	Composite	Electroless Nickel	M
XMT		Ni-PTFE 1000 Hour Grey™	
XO		No Finish	
XW		Cadmium O.D. over Electroless Nickel	J
Z1	Stainless Steel	Passivate	
ZC		Zinc Colbalt	
ZL		Electro-Deposited Nickel	
ZW		Cadmium O.D. over Nickel	
AB	Marine Bronze	None (Clean Only)	

*Consult Factory for Additional Plating Options

D

TABLE III: SHELL SIZE				
Shell Size Code	Shell Size	CC Max Dia	DD Max Dia	EE Thread
A	09	.811 (20.6)	.858 (21.8)	M12 x 1.0-6g 0.100R
B	11	.929 (23.6)	.984 (25.0)	M15 x 1.0-6g 0.100R
C	13	1.110 (28.2)	1.157 (29.4)	M18 x 1.0-6g 0.100R
D	15	1.232 (31.3)	1.280 (32.5)	M22 x 1.0-6g 0.100R
E	17	1.358 (34.5)	1.406 (35.7)	M25 x 1.0-6g 0.100R
F	19	1.469 (37.3)	1.516 (38.5)	M28 x 1.0-6g 0.100R
G	21	1.594 (40.5)	1.642 (41.7)	M31 x 1.0-6g 0.100R
H	23	1.720 (43.7)	1.768 (44.9)	M34 x 1.0-6g 0.100R
J	25	1.843 (46.8)	1.890 (48.0)	M37 x 1.0-6g 0.100R

High Voltage Electrical Power Distribution



From 0 to 60 in 3.9 Seconds

High voltage electrical power distribution is a critical component of the 100% electric Tesla Roadster.

The reliable distribution of electrical energy from the car's lithium-ion energy storage system to the vehicle's motor, electronic control module, HVAC system, transmission and regenerative braking unit depends on a high-performance wiring system made up of high-temperature

shielded conduit and ruggedized reverse-bayonet power connectors—all made by Glenair.

Glenair is on the forefront of innovative efforts to advance the reliability and performance of electric vehicles. Glenair power connectors, cables and conduit are deployed in high-voltage power management and distribution applications for systems as demanding as military vehicles—and as fast as the Tesla Roadster.



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www.glenair.com

One Stop Shopping for All Your Backshell, Connector and Cable Assembly Requirements

Shield termination banding tools and connector-to-backshell assembly tools are just part of the story

Glenair addresses interconnect system assembly requirements with a variety of military standard and specialized connector-to-backshell assembly tools, braided shielding banding tools and accessories. Our tool line for composite components includes connector wrenches, as well as universal connector holding tools for production use as well as field maintenance.

Glenair's connector and backshell holding tools and wrenches ensure fast and reliable

Glenair's Band-It® Termination System for braided metal and composite shielding includes both hand-held and bench-mounted units. The Band-It® Termination System provides fast and reliable shield terminations which pass the most stringent shock, vibration and thermal tests. The low-profile and smooth inside diameter of the one-piece austenitic stainless steel clamping band virtually eliminates RFI/EMI leakage paths.

Backshell Assembly Tools

Banding Shield Termination Tools

Ergonomic Designs

Battlefield Tested Tools and Kits

Teflon Coated Jaws Prevent Damage

Individual Tools and Turnkey Kits

All Tools Quality Made in USA



assembly of interconnect components to correct torque levels—a critical issue with all types of coupling systems. Special designs fit the unique knurling on composite connectors and backshells.

For more information on the complete range of tools supplied by Glenair, please see our *Interconnect Cable Assembly Tools* catalog, visit our website or consult the factory

Glenair Assembly Tools Help Prevent Distortion and False Tightening Problems

Composite backshell tightening tools are available and provide virtually a full 360° gripping surface on backshell coupling nuts. These innovative tools minimize the possibility of coupling nut distortion and false tightening problems often caused by soft-jaw pliers or strap wrenches.

Reliable Installation of Glenair Backshells on Circular Connectors

When used with the appropriate connector holders and torque wrenches, Glenair Backshell Assembly Tools provide the user with consistent, repeatable backshell installations. Designed primarily for production assembly use, the tools can also be used equally well for successful field maintenance operations.

Glenair Backshell Assembly Tools may also be utilized effectively with backshell rotatable couplers produced by other manufacturers, providing the "B" reference diameters are consistent with those shown within this catalog.

Recommended Tightening Procedures

Recommended tightening procedures, tools and torque values offered by Glenair are intended as an aid to properly fasten the backshell to the connector interface threads.

Glenair offers a variety of tools to accomplish proper tightening; our 600-091 Hex Wrench is configured to make provide support to each

specific coupling nut to be tightened, our TG70 strap wrench is intended for general use on cable clamps. Hand-held and bench-mount torque wrenches accommodate our 600-005 plug or receptacle connector holders (see *Backshell Assembly Tool* catalog).

When tightening backshell onto connectors, it is important to follow Glenair's recommended procedures for each tool being used.

When tightening backshells with rotatable coupling nuts, Glenair recommends the backshell to be hand tightened to engage the connectors interlocking teeth or spline features, making sure the teeth are fully engaged before fully torquing with our tools. We also suggest retorquing by removing the tool and reinstalling the tool approximately 90° away from the initial position and tightening to the connector manufacturer's recommended value.

Composite backshells should be tightened to 80% of the values shown for AS85049 light and medium duty torque. Secondary components such as: Glenair's cable clamps, gland sealing nuts, sleeves or adapters, not directly fastened to the connector should be tightened 40 to 60 inch pounds to insure proper performance.

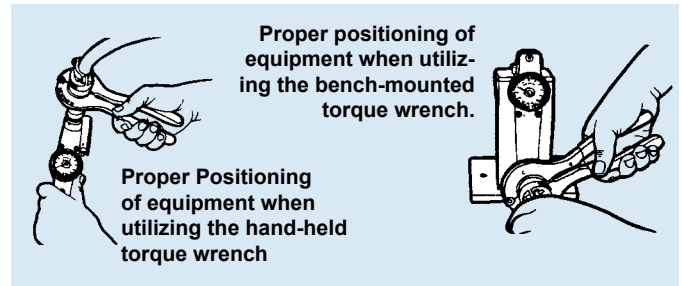
Four Easy Steps for Proper Backshell Assembly

1. Select plug or receptacle holder (most holder series provide "universal polarization", but a few connector series require specific polarization for each alternate keying arrangement).
2. Set desired torque on torque wrench.
3. Mount holder on square drive of torque wrench. Carefully mate with connector, and hand-tighten Glenair backshell coupling. To assure proper mating, anti-rotation teeth must be fully engaged.
4. Tighten rotatable coupler with assembly tool. Do not use excessive grip on handles. When coupler begins to tighten, relax grip and rotate assembly tool back 90°, then resume grip and continue to tighten; repeating this sequence until desired torque level is reached.

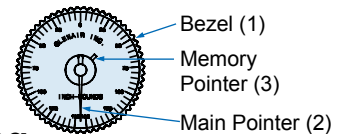
CAUTION: Do not apply torque in excess of signal setting. Excess torque will cause signal pointer to reset and give erroneous readings.

Setting Torque Levels

To verify proper backshell installation values, electrical signals are built into bench-mounted (audio) and hand-held (light) torque wrenches. The procedure for setting torque levels is the same for both units.



Setting Desired Torque for Right-Hand Thread Tightening



To set torque, turn Bezel (1) clockwise until signal is on. Continue to turn Bezel until Main Pointer (2) is at desired torque level on scale. You may cover the audio signal during this procedure to minimize noise level when setting the bench-mounted unit.

The Memory Pointer (3) is set by the above procedure. With this accomplished, turn Bezel counter-clockwise until the Main Pointer is aligned with zero on the scale. Your torque wrench is not ready for operation.

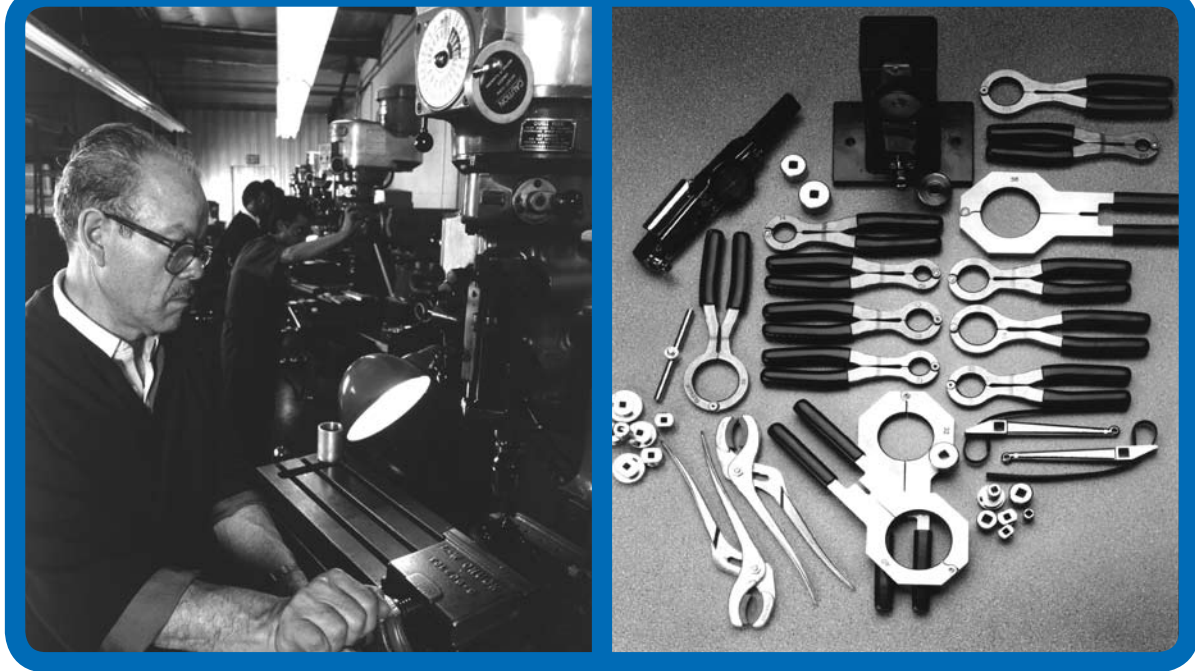
Resetting the Memory Pointer

When you wish to change torque levels, rotate the Bezel counter-clockwise until the signal is on. Continue to rotate Bezel until Memory Pointer is aligned with zero on the scale. now repeat the above procedure for setting torque.

Setting Desired Torque for Left-Handed Thread Tightening

Simply reverse the above procedure for setting the desired torque for left-hand thread tightening.

Stop Toolin' Around



Finding the right tool for the job just got a little bit easier

Nobody can grasp the ins-and-outs of interconnect tool design and manufacturing without a full understanding of cable harness assembly.

At Glenair, we not only manufacture the connectors, backshells, cables and enclosures which go into interconnect cable harnesses, we run a top-flight cable assembly service of our own. And we've drawn on this extensive experience to design and build

a complete family of specialized backshell assembly tools for most Mil-Standard circular connectors, as well as connector wrenches, mini-strap wrenches, universal connector holding tools and braid termination tools for production use and field maintenance.

Glenair is also now offering a broad range of fiber optic termination tools, including complete kits for both our Mil-T-29504 and front-release COTS termini.



1211 Air Way

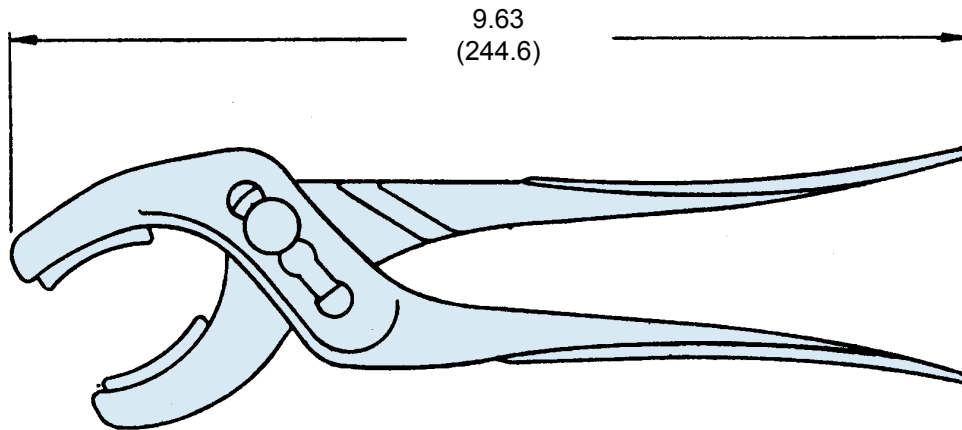
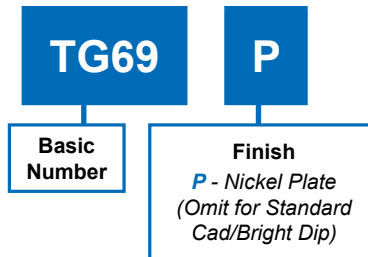
Glendale, California 91201-2497

Telephone: 818-247-6000 · Facsimilie: 818-500-9912 · EMail: sales@glenair.com

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TG69 Soft Jaw Pliers



NOTE: Not recommended for composite coupling nuts (use 600-091 or 600-157)

APPLICATION NOTES

1. Assembly identified per MIL-STD-130
2. Nylon replacement inserts: P/N G77015

ALUMINUM TOOL FOR USE WITH GLENAIR COMPOSITE BACKSHELLS

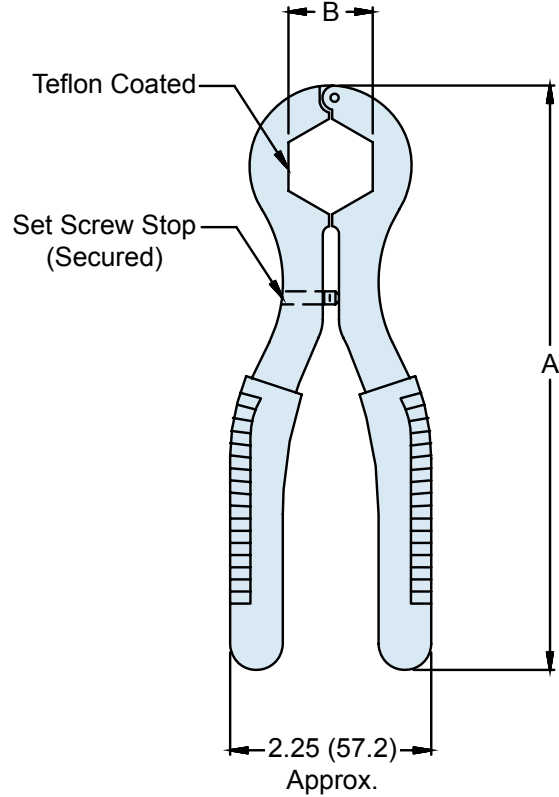
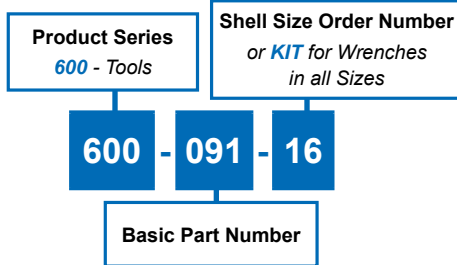


TABLE I: SHELL SIZE ORDER NUMBER

Order No.	A Ref.	B Hex	Shell Size Ref.	Composite Torque Inch Pounds
08	7.38 (187.5)	.750 (19.1)	08/09	40
10	7.50 (190.5)	.875 (22.2)	10/11	40
12	7.50 (190.5)	1.000 (25.4)	12/13	40
14	7.50 (190.5)	1.125 (28.6)	14/15	40
16	7.50 (190.5)	1.250 (31.8)	16/17	40
18	7.75 (196.9)	1.375 (34.9)	18/19	40
20	8.00 (203.2)	1.500 (38.1)	20/21	80
22	8.25 (209.6)	1.625 (41.3)	22/23	80
24	8.25 (209.6)	1.750 (44.5)	24/25	80
28	8.50 (215.9)	2.000 (50.8)	28	120
32	10.00 (254.0)	2.250 (57.2)	32	120
36	10.00 (254.0)	2.500 (63.5)	36	120

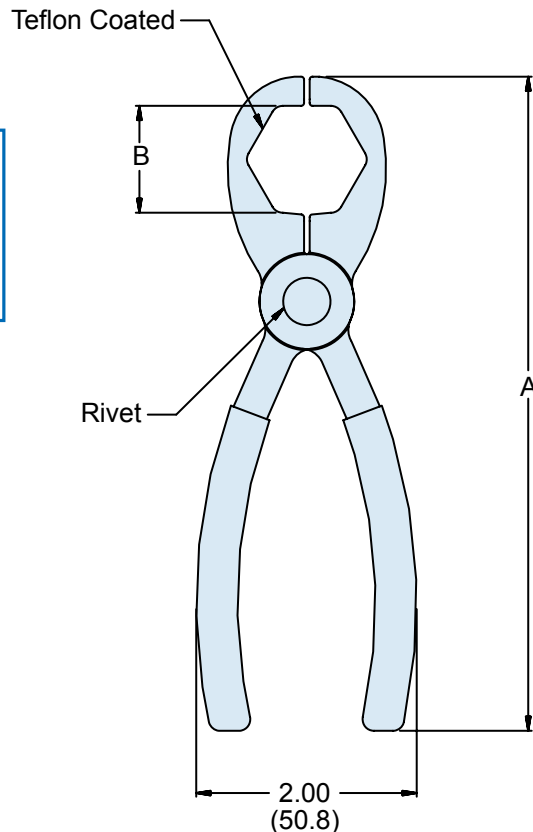
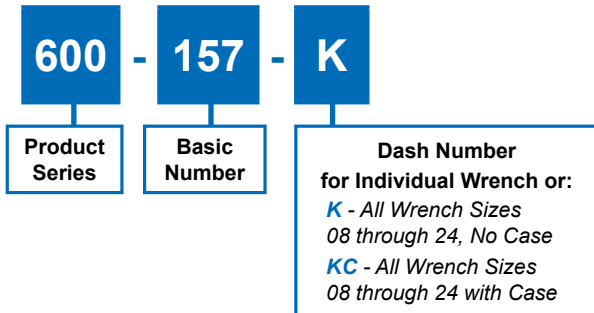
APPLICATION NOTES

1. Metric dimensions (mm) are in parentheses and are for reference only.
2. B Hex is critical, adjust set screw until dimension is within tolerance (+/- .005)
3. This backshell assembly tool is designed for Glenair composite hex coupling applications and should be used in conjunction with Glenair torque wrenches.
4. These wrenches are made of aluminum alloy with vinyl grips.

600-157 Composite Connector Accessory Coupling Nut Wrench



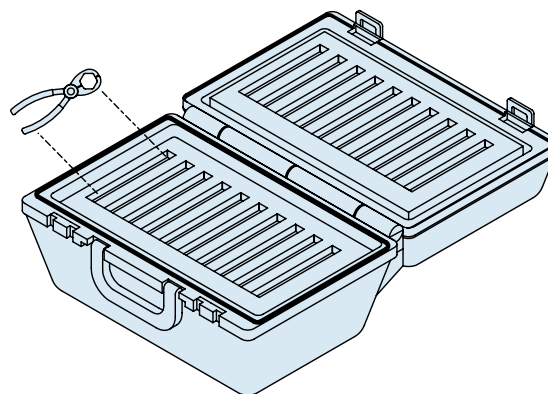
STAINLESS STEEL TOOL FOR USE WITH GLENAIR COMPOSITE BACKSHELLS



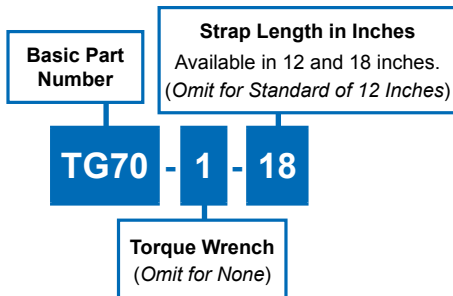
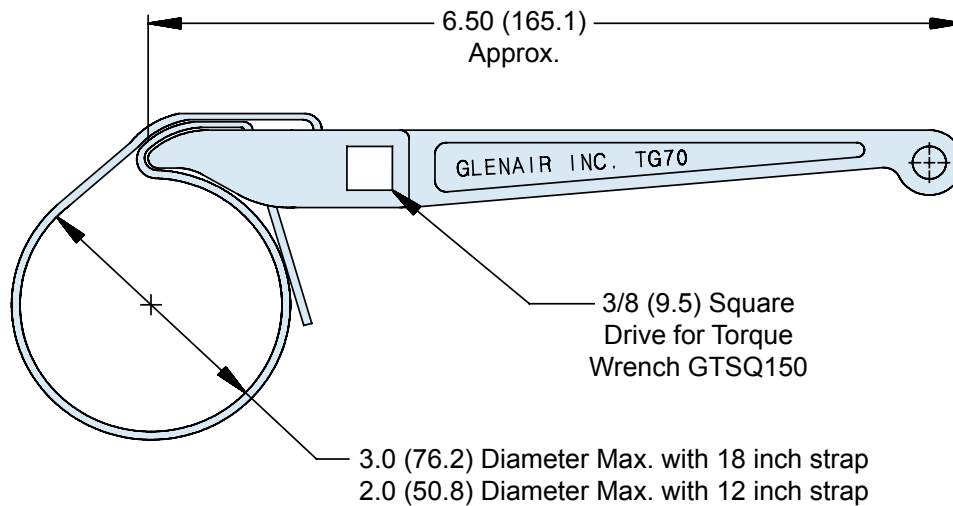
Dash Number	A Ref	B Hex ±.005 (0.1)	Connector for Shell Size	
			Codes A & F	Code H
08	6.700 (170.2)	.750 (19.1)	08	09
10	6.750 (171.5)	.875 (22.2)	10	11
12	6.810 (173.0)	1.000 (25.4)	12	13
14	6.880 (174.8)	1.125 (28.6)	14	15
16	6.950 (176.5)	1.250 (31.8)	16	17
18	7.050 (179.1)	1.375 (34.9)	18	19
20	7.150 (181.6)	1.500 (38.1)	20	21
22	7.380 (187.5)	1.625 (41.3)	22	23
24	7.440 (189.0)	1.750 (44.5)	24	25

APPLICATION NOTES

1. This backshell assembly tool is designed for Glenair composite hex coupling applications and should be used in conjunction with Glenair torque wrenches.
2. These wrenches are made of stainless steel with vinyl grips.
3. Metric dimensions (mm) are indicated in parentheses.



TG70 Strap Wrench



VARIANCE CHART TG-70 Strap Wrench Used with Glenair Torque Wrenches		
Accessory Shell Size	Recommended Installation Torque	
	Light/Medium Duty	
	± 5 Inch Pounds	
	TG70 Torque	Part Torque
08/09	28	35
10/11	28	35
12/13	30	40
14/15	30	40
16/17	30	40
18/19	30	40
20/21	75	80
22/23	75	80
24/25	75	80
28	75	80
32	75	80
36	75	80

* TG70 Not Recommended For Values of 120 Inch Lbs. or Greater.

VARIANCE CHART NOTES:

1. Recommended installation torque is approximately 80% of AS85049 accessory thread strength values.

APPLICATION NOTES

1. Metric dimensions (mm) are in parentheses and are for reference only.
2. These wrenches are made of the following materials:
Wrench Handle - Aluminum Alloy/Nickel Plate
Wedge - Stainless Steel/Passivated
Strap - Impregnated Fabric
3. Replacement straps are available. Specify part number G70515 for 12 inch strap or part number G70515-18 for 18 inch strap.
4. Recommended for 440-087 coupler, 360, 370, 380 and 390 series rear clamps. Consult factory for torque values.
5. **Do not use on hex-style composite coupling nuts.**

600-161 Digital Torque Wrench and 600-162 Bench Stand



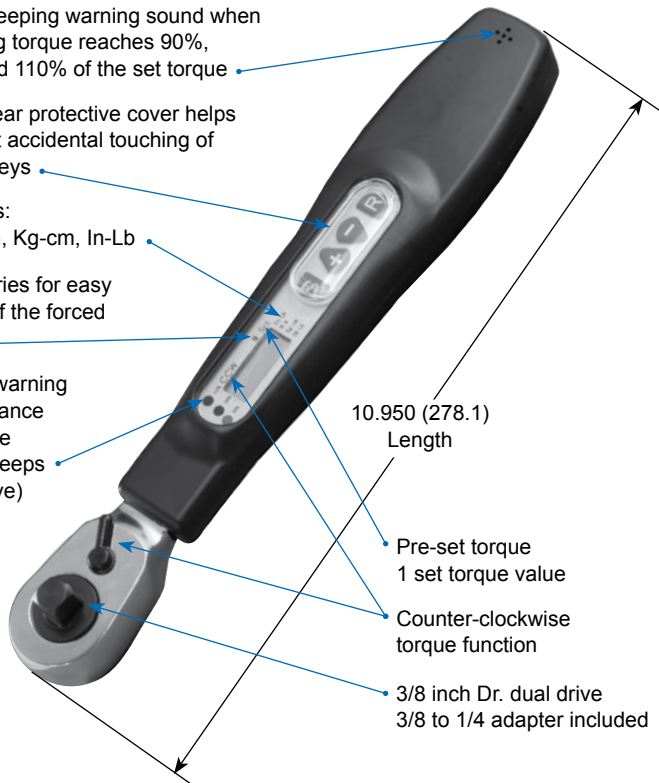
Audible beeping warning sound when the forcing torque reaches 90%, 100%, and 110% of the set torque

Sliding clear protective cover helps to prevent accidental touching of function keys

Four Units: Ft-Lb, Nm, Kg-cm, In-Lb

99 Memories for easy tracking of the forced torques

Flashing warning lights enhance the audible warning beeps (See above)



10.950 (278.1) Length

Pre-set torque
1 set torque value

Counter-clockwise torque function

3/8 inch Dr. dual drive
3/8 to 1/4 adapter included

Hand-Held Digital Torque Wrench

3/8" Dual Drives Top and Bottom to facilitate bench mount operation
Requires two AAA batteries

600-161

99 Presets available for torque level 29 to 310 inch pound range

Clockwise and counter-clockwise provide $\pm 2\%$ accuracy

Torque range:

Ft-Lb = 2.5 ~ 25 Ft-Lb

N m = 3.3 ~ 35N.M

Kg-cm = 34 ~ 340 Kg-cm

In-Lb = 29 ~ 310 In-Lb

Bench Stand

600-162

For Digital Torque Wrench 600-161

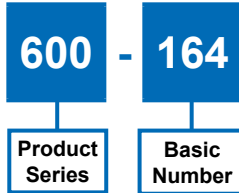
Vertical and Horizontal Mounting Options

Multi-Position Angle Adjustment



Shown with 600-161 Digital Torque Wrench in Position





- Nickel Chrome Plating Resists Corrosion and Rusting
- Broad, Short Jaws Provide Powerful Cutting Action
- Extended Handle Provides Comfort and Cutting Leverage
- High Leverage Provides Powerful Cutting Action for Light Metals, Rubber and Heavy Fabrics
- Cuts Rubber, Cables, Light Metal, Wire Metal Screens and Braided EMI/EMP Shielding, Cordage, Plastics and Rope
- Weight: 0.55 Pounds
- Shear Cut Length: 2.000 (51.0)

Recommended EMI Braid Cutting Procedure

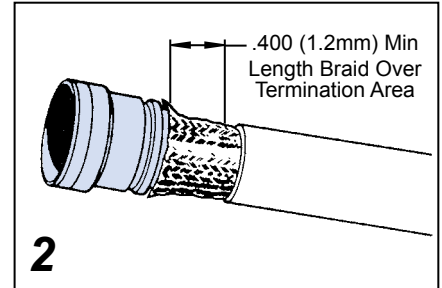
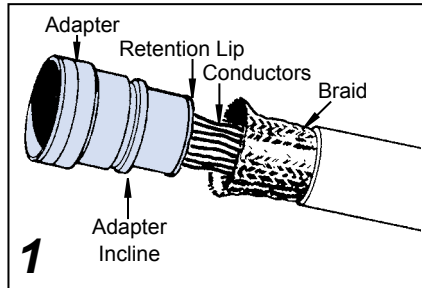
Note: When cutting braid, both metal and especially composite, open cutter blades to allow the full 2" cut. Place braid all the way back onto blades as shown.

APPLICATION NOTES

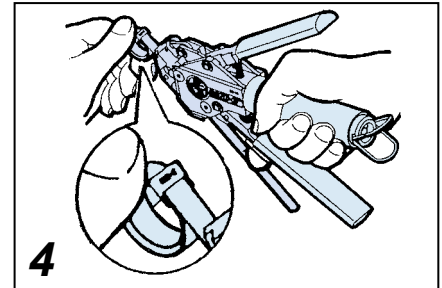
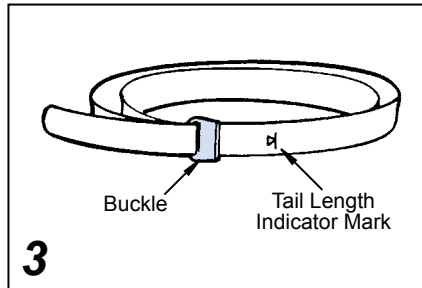
1. Metric dimensions (mm) are indicated in parentheses.
2. Always wear approved eye protection.
3. Never use on or near live electrical circuits.

Shield Termination Assembly Process

1. Prepare Cable Braid for termination process (Figure 1).
2. Push Braid forward over Adapter Retention Lip to the Adapter Incline Point (or .4" [10.2mm] minimum braid length). Milk Braid as required to remove slack and insure a snug fit around the shield termination area (Figure 2).
3. Prepare the Band in the following manner:
 - IMPORTANT:** Due to Connector/Adapter circumference, it may be necessary to prepare the Band around the Cable or Retention Area.



- A. Roll Band through the Buckle Slot twice. (Bands must be double-coiled.)
- B. Pull on Band until Mark (▷) is within approximately .250 inch (6.4mm) of Buckle Slot (Figure 3). The Band may be tightened further if desired.

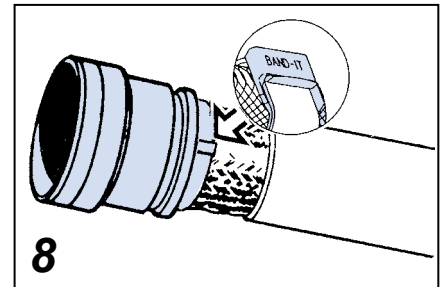
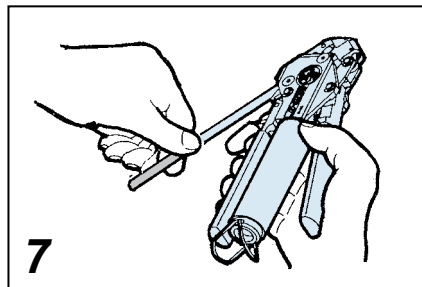
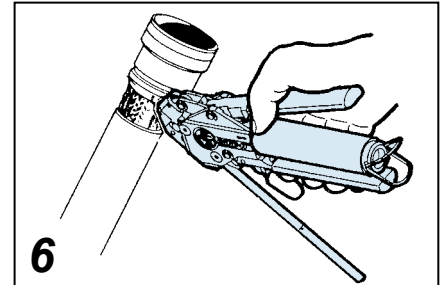
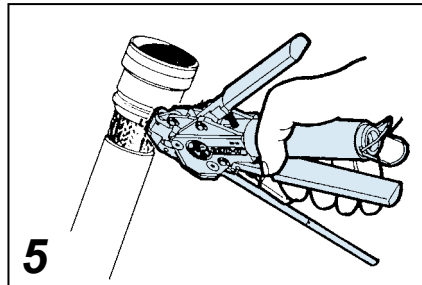


NOTE: Prepared Band should have (▷) Mark visible approximately where shown in Figure 3.

Shield Termination Clamping Process (Figures 4 thru 8)

NOTE: To free Tool Handles, move Holding Clips to center of Tool.

4. Squeeze Gripper Release Lever and insert Band into the front end opening of the Tool. (NOTE: Circular portion of looped band must always face downward.)
5. Aligning the Band and Tool with the Shield Termination Area, squeeze Black Pull-Up Handle repeatedly using short strokes until it locks against Tool Body. (This indicates the Band is compressed to the Tool Precalibrated Tension.)
 - NOTE:** If alignment of band and shield is unsatisfactory, tension on band can be relaxed by pushing on slotted release lever on top of tool. Make adjustments as necessary and again squeeze black pull-up handle.
6. Complete the Clamping Process by squeezing the Gray Cut-Off Handle.
7. Remove excess band from tool and dispose.
8. Inspect Shield Termination.

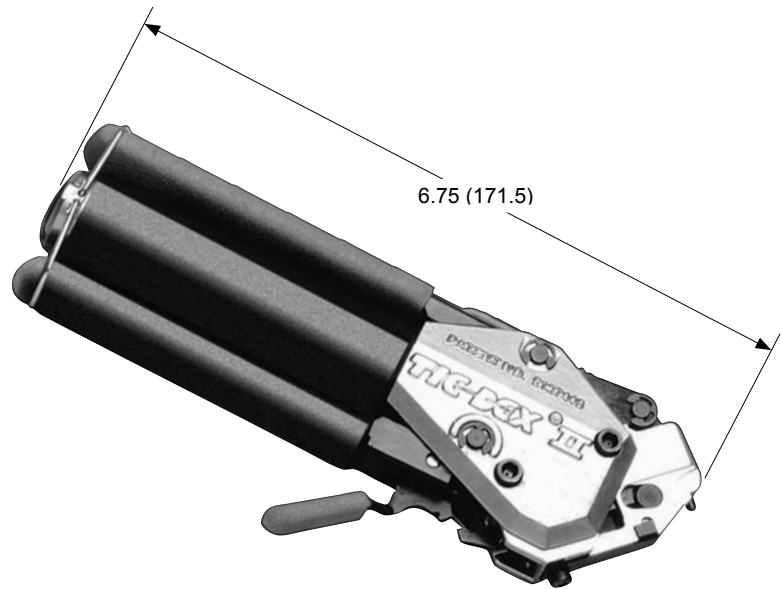


IMPORTANT: Always roll band through the buckle slot twice (see Step 3). Bands must be double-coiled to function correctly. The failure to roll the band through the buckle slot twice is the most common user error in band style terminations.

Hand Banding Tool 600-058

The **600-058 Hand Banding Tool** weighs 1.18 lbs., and is designed for standard clamping bands 600-052 and 600-090 (see page 36) in a tension range from 100 to 180 lbs. Calibrate at 150 lbs. \pm 5 lbs. for most shield terminations. Tool and band should never be lubricated.

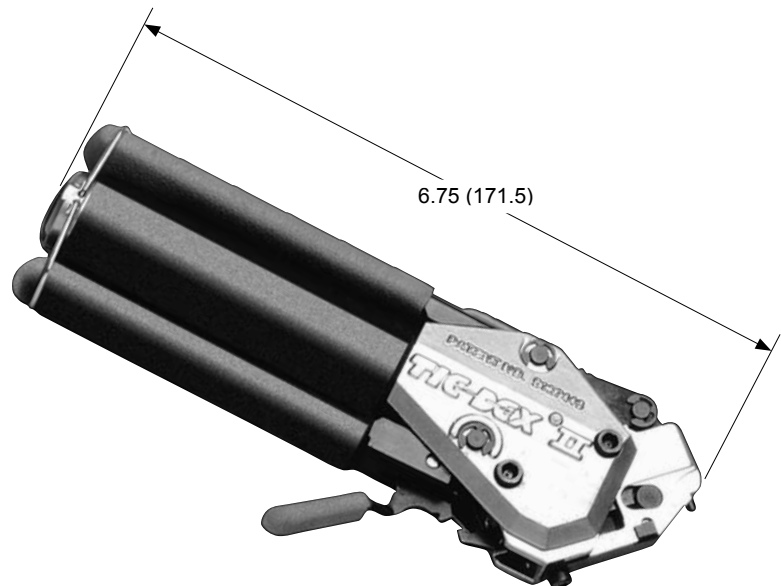
Reference: **BAND-IT®** part number A40199.



Hand Micro Banding Tool 600-061

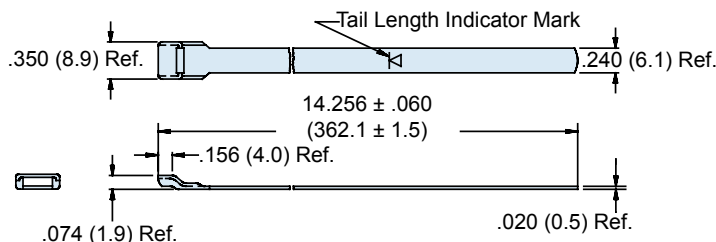
The **600-061 Hand Micro Banding Tool** weighs 1.18 lbs., and is designed for micro clamping bands 600-057 and 600-083 (see page 36) in a tension range from 50 to 85 lbs. Calibrate at 80lbs +2 lbs. -7 lbs. for most shield terminations. Tool and band should never be lubricated.

Reference: **BAND-IT®** part number A30199.



Metric Dimensions (mm) are indicated in parentheses.

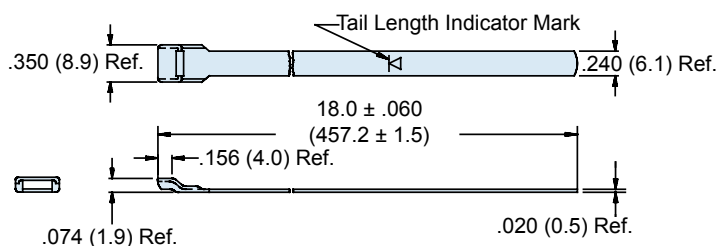
Standard Band 600-052 and Precoiled Standard Band 600-052-1



The 600-052 Standard Band is precision constructed of 300 Series SST/Passivate and designed for use with the 600-058 Hand Banding Tool or the 600-067 Pneumatic Banding Tool. Double-wrapped bands will accommodate diameters up to approximately 1.8 inches (45.7). Bands may be ordered flat (600-052) or precoiled (600-052-1). Bands come bagged and tagged in quantities from 1 to 100.

Reference: **BAND-IT®** part number A10086

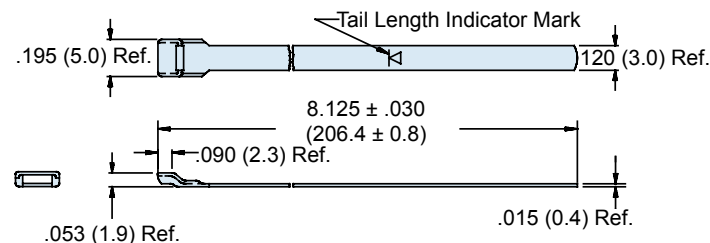
Extended-Length Standard Band 600-090 & Precoiled Extended-Length Standard Band 600-090-1



The 600-090 Extended Length Standard Band is precision constructed of 300 Series SST/Passivate, and designed for use with the 600-058 Hand Banding Tool or the 600-067 Pneumatic Banding Tool. Double-wrapped bands will accommodate diameters up to approximately 2.5 inches (63.5). Bands may be ordered flat (600-090), or precoiled (600-090-1). Bands come bagged and tagged in quantities from 1 to 100.

Reference: **BAND-IT®** part number A11086

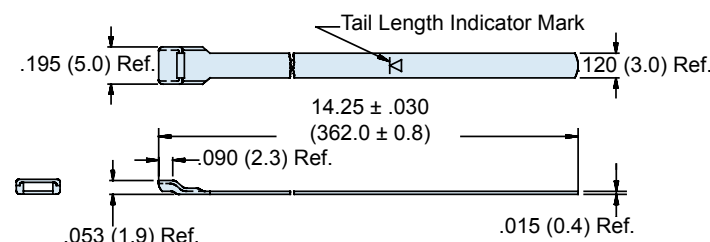
Micro-Band 600-057 Precoiled Micro-Band 600-057-1



The 600-057 Micro Band is precision constructed of 300 Series SST/Passivate, and designed for use with the 600-061 Hand Banding Tool or the 600-068 Pneumatic Banding Tool. Double-wrapped bands will accommodate diameters up to approximately .88 inches (22.4). Bands may be ordered flat (600-057), or precoiled (600-057-1). Bands come bagged and tagged in quantities from 1 to 100.

Reference: **BAND-IT®** part number A31186

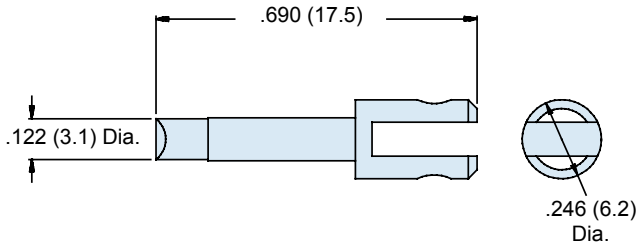
Extended Length Micro-Band 600-083 Precoiled Micro-Band 600-083-1



The 600-083 Extended Length Micro-Band is precision constructed of 300 Series SST/Passivate, and designed for use with the 600-061 Hand Banding Tool or the 600-068 Pneumatic Banding Tool. Double-wrapped bands will accommodate diameters up to approximately 1.88 inches (47.8). Bands may be ordered flat (600-083), or precoiled (600-083-1). Bands come bagged and tagged in quantities from 1 to 100.

Reference: **BAND-IT®** part number A31086.

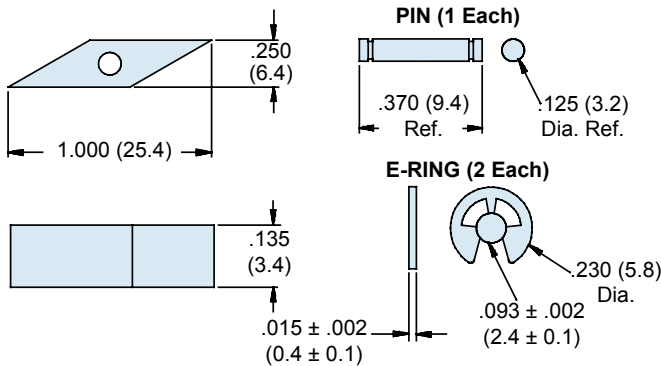
Metric dimensions (mm) are indicated in parentheses. Consult factory for diameters above 2.5 inches (63.5).



600-082 Cutter Knife

The 600-082 Cutter Knife replaces the cutter knife on the 600-061 Hand Banding Tool, and the 600-068 Pneumatic Banding Tool. Material is heat treated steel finished with black oxide and rust preventative.

Reference: **BAND-IT®** part number **A48087**

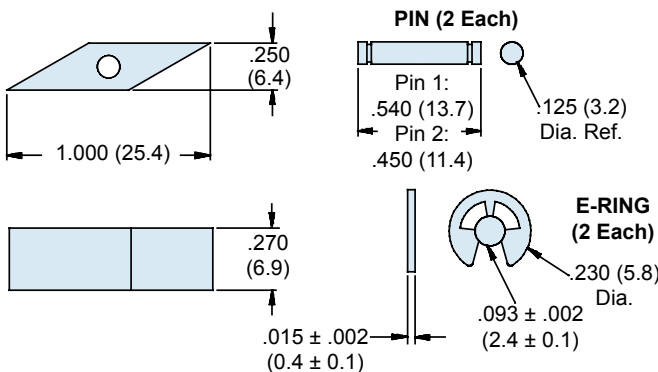


600-060-1 Micro Cut-Off Blade Kit

The 600-060-1 Micro Cut-Off Blade Kit for Serial Numbers up to 20999 consists of the blade, two E-rings and one pin, providing all parts needed to replace the cut-off blade on the 600-061 Hand Micro Banding Tool and the 600-068 Pneumatic Micro Banding Tool. Material is heat treated steel finished with black oxide and rust preventative.

Reference: **BAND-IT®** part number **A43999**.

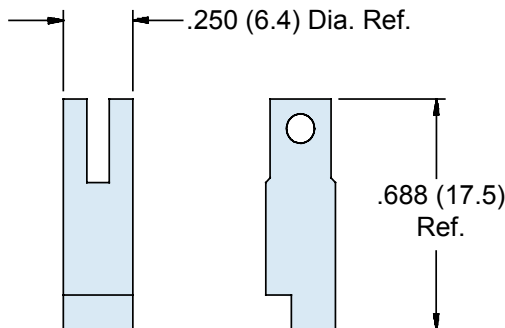
600-060-2 Ref. BAND-IT® P/N A47899 for Serial Numbers **21000** and above.



600-056 Cut-Off Blade Kit

The 600-056 Cut-Off Blade Kit consists of the blade, two E-rings and one pin, providing all parts needed to replace the cut-off blade on the 600-058 Hand Banding Tool and the 600-067 Pneumatic Banding Tool. Material is heat treated steel finished with black oxide and rust preventative.

Reference: **BAND-IT®** part number **A40699**.



600-062 Cutter Knife

The 600-062 Cutter Knife for Serial Numbers up to 16589 replaces the cutter knife on the 600-058 Hand Banding Tool and the 600-067 Pneumatic Banding Tool. Material is heat treated steel finished with black oxide and rust preventative.

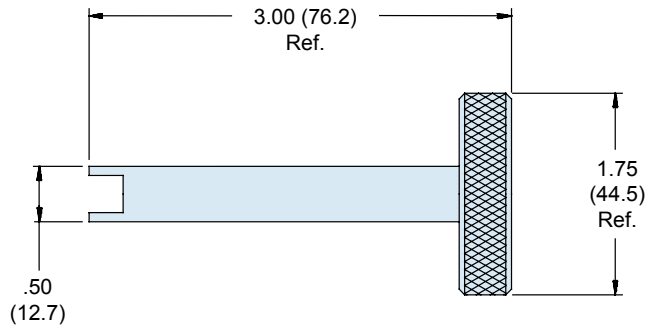
Reference: **BAND-IT®** part number **A40788**.

600-062-1 for Serial Numbers **16590** and above.

Reference: **BAND-IT®** part number **A67787**.

Metric Dimensions (mm) are indicated in parentheses.

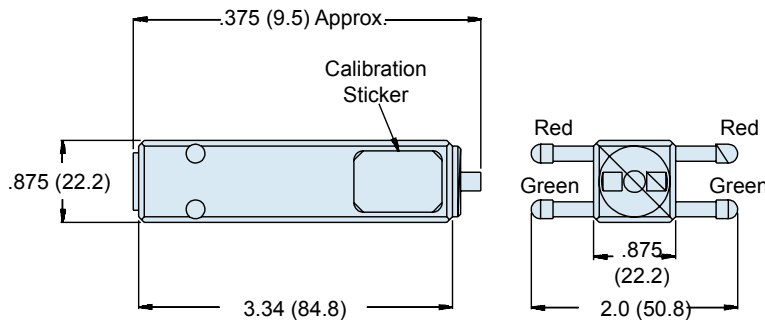
600-055 Calibration Key and 600-072-1 Standard and 600-086-1 Micro Banding Tool Tension Gauges



600-055 Calibration Key

The 600-055 Calibration Key is designed for use with the 600-061 and 600-058 Hand Banding Tools. Material is black anodized aluminum alloy. One full turn clockwise will advance the tension range by 25 lbs., and a counter-clockwise turn will decrease tension by the same amount. Recommended for purchase with 600-072-1 and 600-086-1.

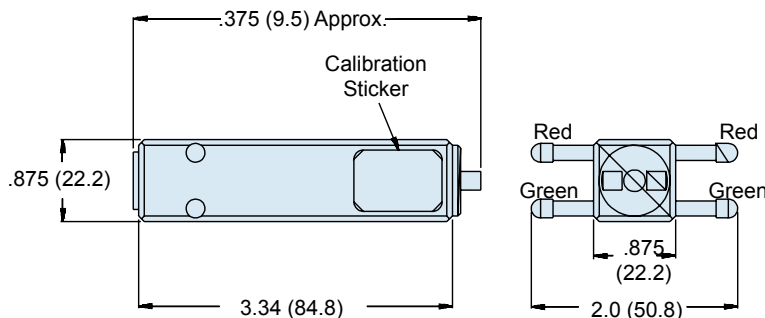
Reference: **BAND-IT®** part number A44699.



600-072-1 Standard Tension Gauge

The 600-072-1 Tension Gauge is used to check and calibrate the *Tie-Dex II®* standard hand tool to values noted on calibration sticker. Constructed of hardened steel, the gauge's accuracy is within ± 2 lbs.

Reference: **BAND-IT®** part number A48599.



600-086-1 Micro Tension Gauge

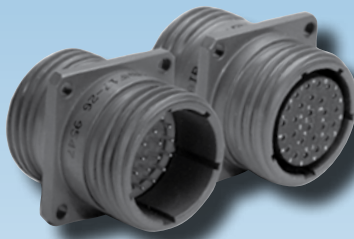
The 600-086-1 Micro Tension Gauge is used to check and calibrate the *Tie-Dex II®* micro hand tool to values noted on calibration sticker. Constructed of hardened steel, the gauge's accuracy is within ± 2 lbs.

Reference: **BAND-IT®** part number A47599.

Metric Dimensions (mm) are indicated in parentheses.

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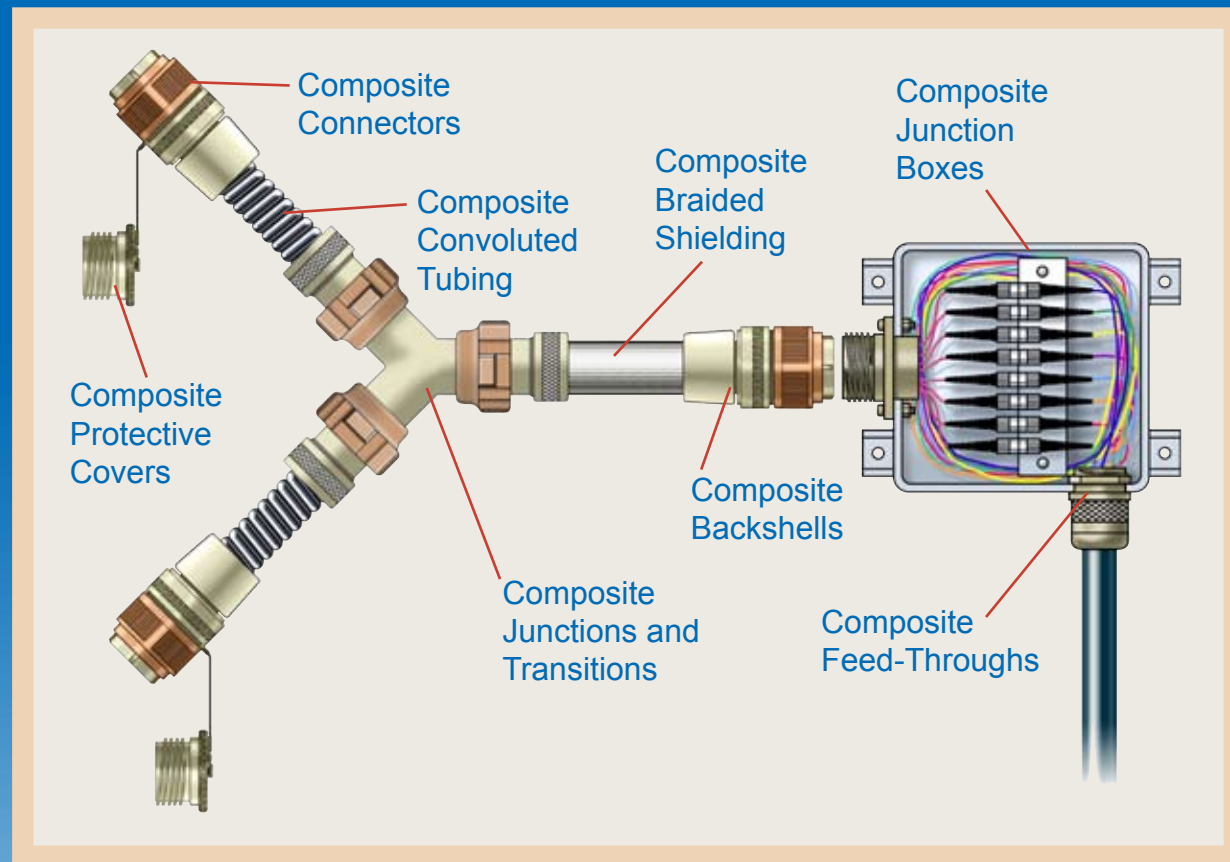
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Composite Thermoplastic



Soup to Nuts

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