

Amphenol® Pyle® MIL-C-26500 Connectors

MS-101-3

**Miniature Cylindrical Connectors for
Military and Aerospace Applications**



Amphenol

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If more information is needed concerning the connectors covered in this publication,
or if there are special application needs, please contact:

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Amphenol is a Certified ISO 9001 Manufacturer.

Amphenol® /Pyle®

MIL-C-26500 Connectors - environmental connectors for military/aerospace applications

High quality and dependability are the earned reputations of the Amphenol®/Pyle® Series of connectors designed to meet the specification requirements of MIL-C-26500.

Serving such diverse fields as avionics, missile systems, aircraft general-purpose applications, aircraft engines and firewalls, the Amphenol®/Pyle® MIL-C-26500 connector family meets the myriad of problems with innovative connector solutions.

Amphenol®/Pyle® MIL-C-26500 Connectors are medium sized connectors with a rugged design, lightweight construction and continuously dependable performance. This product family provides design features and options which are listed below in the order of the sections of this catalog.

-
- **Aluminum Shells in threaded or bayonet coupling, proprietary (ZZY or ZZW), or supplied to military classes R and G**
 - general purpose, environmentally resistant
 - square flange or single hole receptacles, and straight plug shell styles
 - ratchet lock plug style, which eliminates the need for safety wiring, and a mating threaded receptacle
 - black anodize non-conductive finish for class R and a conductive finish in class G that provides a minimum resistance path through the shell for grounding purposes
 - coupling nuts are hardcoat treated for added protection against wear
 - rear accessory threads accommodate standard MS27291 series cable supports or related accessory hardware
 - **Stainless Steel Shells in threaded or bayonet coupling, proprietary (ZZY or ZZW), or supplied to military class E**
 - machined from 300 series stainless steel providing superior strength and wear characteristics
 - at elevated temperatures, 204°C (399°F), shells experience a less than 10% loss in yield strength
 - shell hardware resists corrosion for the life of the connector without the need of additional finishes
 - same shell styles offered as in aluminum
 - a variety of stainless steel accessories are available
 - **Amphenol special application connector, 48 Series* receptacle short skirt**
 - low profile design for restricted installation requirements
 - **Wire splice connector**
 - space saving, single contact, wire splice module
 - **Firewall Capability Connectors meet the fireproof requirements of MIL-C-5015, Class K. Proprietary (FPK or FYL), or supplied to military Class K**
 - also **FPL** - threaded coupling, same as FPK but used on Lockheed Aircraft. and **FP5K** - threaded coupling, qualified for General Electric
 - non-magnetic stainless steel shells designed for superior strength and elevated temperatures up to 460°F for extended periods
 - same shell styles as stainless steel and aluminum versions
 - **Hermetically sealed MIL-C-26500 connectors, supplied to military class H are also available.**
 - See page 26 for brief description
 - See page 4 for hermetic insert availability
 - Consult Amphenol, Sidney, NY for availability and ordering information.
 - **Contacts and Accessories for MIL-C-26500 connectors**
 - MIL-C-39029 qualified contacts and special application contacts including thermocouple, printed circuit board and shielded/coaxial types
 - Boeing specification contacts
 - Aluminum and stainless steel cable supports; aluminum dummy receptacles
 - Contact crimping/ installation/removal tools for Amphenol 48 series and Pyle-National MIL-C-26500 series

* For more information on other Amphenol®/Pyle® 48 Series products consult Amphenol, Sidney, NY.

MIL-C-26500 Connectors

features

Amphenol®/Pyle® MIL-C-26500 Connectors are qualified to Military Specification MIL-C-26500, as well as numerous high performance customer specifications. As the chart below indicates, these connectors are available with aluminum or stainless steel shells – bayonet or threaded – and are qualified to meet the specifications of these MIL-C-26500 classes:

MIL-C-26500 Classes	Amphenol/Pyle Series Classes	Hardware Description	Finish
Class R: (Environmental Resistant)	A	Aluminum Alloy	Anodize
Class G	M	Aluminum Alloy	Chromium
Class E	R	Stainless Steel	Passivated
Class K Firewall	FPK/FYL	Stainless Steel	Passivated
Class H Hermetic	HC	CRS/Stainless Steel	Various

Crimp Contacts

Rear insertable, front releasable, crimp style contacts are machined from a copper alloy material, plated gold over nickel, and are qualified to specification MIL-C-39029. Contacts are crimp terminated outside the connector assembly and inserted into the appropriate cavity by means of a hand tool.

Socket contacts utilize a multi-tined construction and feature a “C” spring which grips the tines, and thus insures consistent and repetitive insertion/withdrawal forces. Contact tines are protected by a stainless steel shroud.

An optional pencil-clip thermocouple socket design is also offered. See page 27 for more information on thermocouple contacts.

Alternate Keying

All MIL-C-26500 Series Connectors with aluminum and stainless steel hardware, can be furnished with normal or any of five alternate key positions. (See page 4).

Each plug shell has a master key and four alternate keys. The position of the alternate keys in relation to the fixed master key determines the key identification. Inserts are bonded to the shell in relation to the master key, thus allowing positive protection against mismatching when differing circuits exist side by side.

Connector Sealing

The insert design utilizes a combination of resilient and rigid insulators to offer a connector with total sealing capabilities.

Bonded interfaces between the resilient and rigid dielectric components eliminate air voids and thus protect the connector from potential degradation due to moisture and altitude conditions.

In Firewall Class K connectors the resilient insert forms the primary contact seal and is bonded to a molded ceramic rigid insert. The insert assembly is physically bonded and mechanically retained to the inside surface of the stainless steel shell, providing a voidless, monoblock configuration impervious to adverse environments.

A pressure seal at the connector interface is accomplished through the aid of a coupling device which compresses the front resilient insulations and thus offers a seal around each contact which prevents the passage of air or moisture through the contact cavity. Back resilient insulators are designed with a triple sealing grip at each wire hole to offer positive sealing and prevent wicking of moisture through the connector without the use of external clamping rings or adapters.

In addition, a dynamic “O” ring seal engages the front of the plug shell when connectors are mated and offers yet another barrier to moisture and containments.

Fluid/Temperature Resistance

The fluorosilicone compound elastomer, developed by Pyle-National, exceeds all specification requirements and provides excellent resistance to tear, compression set, fluids, and high temperatures.

Amphenol/Pyle's fluorosilicone compound offered in Class R, G, E and K is capable of reliability resisting MIL-H-5606 hydraulic fluid and MIL-L-9236 lubricating oil; as well as MIL-L-7808 and MIL-L-23699 lubricating oils, MIL-J-5624 (JP-5) jet fuel, glycol, and alkaline cleaning solutions of pH 10 or higher. Test methods are as defined in MIL-C-26500 specification. Alternate compounds have been developed by Pyle-National to solve unique user requirements not addressed by the specifications.

Connectors have the capability of resisting high ambient temperatures up to 200°C (392°F) for long periods of time, thus contributing to an extended connector life. Connectors will withstand a combined ambient and internal temperature due to thermal rise of current carrying capacity of 238°C (469°F).

Amphenol®/Pyle® Firewall, Class K, connectors have the inherent ability to resist high temperatures up to 460°F (total temperature) for extended periods of time and can resist short time exposures (20 minutes) to prevent passage of a direct 2000°F flame.

MIL-C-26500

specifications

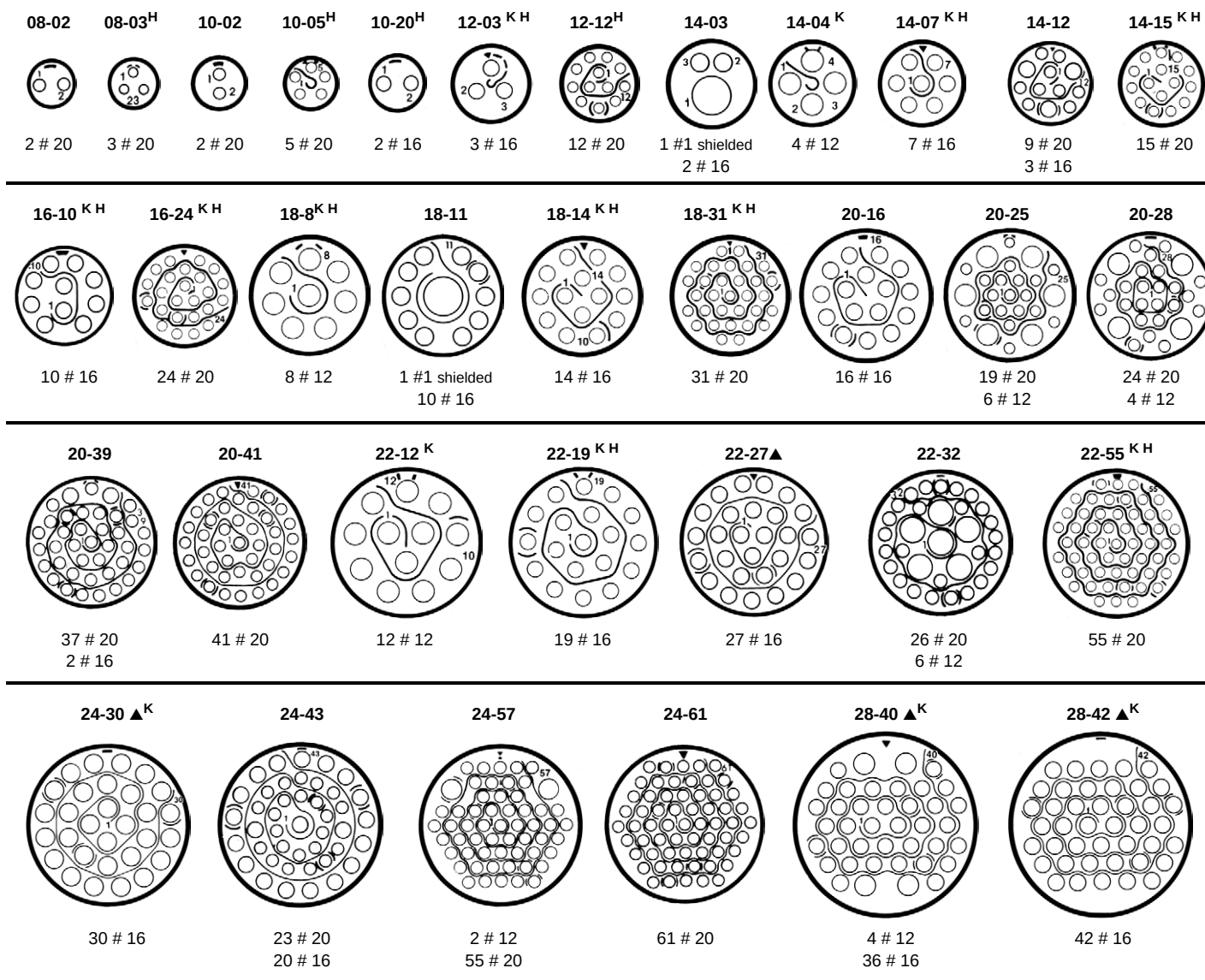
TEST REQUIREMENTS	MILITARY SPECIFICATIONS	PYLE CONNECTOR CAPABILITIES
Air Leakage (Classes E, G, R & K)	1 cu. inch per hr. max. -55°C (-67°F)	Comply
Altitude Immersion (Classes E, G, R & K)	Sea level 1 inch of mercury, 3 cycles (IR 5000 megohms hi-pot 1500 volts-submerged)	Comply
Contact Retention (Classes E, G, R & K)	Size 20 contact 20 lbs. min. Size 16 contact 25 lbs. min. Size 12 contact 30 lbs.min.	Exceeds specifications
Collet Retention	No requirement	Without damage to the collet or its retention means: Size 20 – 75 lbs. min. Size 16 – 140 lbs. min. Size 12 – 160 lbs. min.
Contact Insertion Force (Classes E, G, R & K)	All size contacts 10 lbs. max.	Comply
Coupling Forces	Torque required to couple and uncouple mating plugs and receptacles is not to exceed the values listed: Shell size 8 10 12 14 16 18 20 22 24 Torque inch lbs. 9 10 14 17 23 26 31 38 46	Comply
Fluid Resistance (Classes E, G, R & K)	20 hrs. immersion in MIL-H-5606 hydraulic fluid and MIL-L-9236 lubrication oil. Must meet hi-pot.	20 hrs. min., fully functional physically and electrically after immersion. No deterioration of resilient material.
Ground Resistance (Class G)	.250 ohms backshell of plug to rear of receptacle flange.	Comply
High Potential (Classes E, G, R & K)	1500 VRMS mated & unmated at sea level 1000 VRMS mated to 110,000 ft. altitude	Exceed with ample margin of safety.
Insert Retention (Classes E, G, R & K)	75 psi. from either direction for 5 seconds.	Exceeds specifications.
Insulation Resistance (Classes E, G, R & K)	21°C (70°F), 5000 megohms between adjacent contacts and any contact and shell.	Exceeds specifications.
Low Temperature (Classes E, G, R & K)	-55°C (-67°F)	Comply
Magnetic Permeability (Classes E, G, R & K)	2 mu. maximum	Comply
Moisture Resistance (Classes E, G, R & K)	1000 megohms min. per mil-std. 202 method 106	Comply
Ozone Exposure (Classes E, G, R & K)	0.10 to .015% ozone exposure	Comply
Physical Shock (Classes E, G, R & K)	50 G's, 3 axis, per mil-std-202, method 213, test condition C, wired to monitor 1 microsecond discontinuity.	Comply
Sand & Dust Exposure (Classes E, G, R & K)	No requirement.	Meet MIL-E-5272 condition "B"
Temperature Life (Classes E, G, R & K)	Connector fully functional for 1000 hours at 200°C (392°F) ambient internal temperature 238°C (460°F)	Comply
Thermal Shock (Mated) (Classes E, G, R & K)	Cycled five times from -55°C to 260°C, held for 30 minutes at each temperature and transferred to the other in 2 minutes or less, with no evidence of damage.	Comply
Vibration (Classes E, G, R & K)	MIL-Std. 202 method 204 condition "D" at R. T., -55°C (-67°F) and +200°C (+392°F).	Comply - monitored for a max. of 1 micro-second discontinuity.
Flame Resistance (Class K)	Performance requirements of Paragraph 4.5.18 Fireproof (Class K of MIL-C-5015D)	Exceeds specifications

MIL-C-26500

insert arrangements

Contact cavities are identified with a spiral guide line indicating cavity sequence. The first and last cavities are numbered and every tenth cavity is bracketed.

Rear face of pin insert shown (socket insert opposite).
Symmetrical about center line.
▲ designates Non-MS Configurations.
K designates Firewall Class K inserts.
H designates Hermetic inserts.

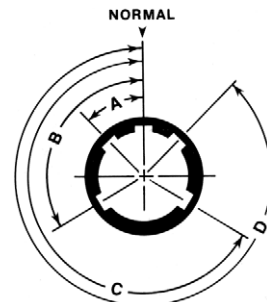


Alternate Keying

ALTERNATE POLARITY KEYWAY ARRANGEMENTS (Shell sizes 12, 14, 16, 18, 20, 22, 24, 28)
View of front face of receptacle shell. Angles are counter-clockwise from "N" keyway. For plug shell, the key locations are clockwise when viewed from front of plug.

Position	For Connectors Size 8 and 10				For Connectors Size 12, 14, 16, 18, 20, 22, 24 and 28			
	A	B	C	D	A	B	C	D
Normal	105°	140°	215°	265°	105°	140°	215°	265°
6	102°	132°	248°	320°	18°	149°	192°	259°
7	80°	118°	230°	312°	92°	152°	222°	342°
8	35°	140°	205°	275°	84°	152°	204°	334°
9	64°	155°	234°	304°	24°	135°	199°	240°
Y or 10*	25°	115°	220°	270°	98°	152°	268°	338°

* Y is used for all Military part number callouts - aluminum/stainless steel and firewall; 10 is used for Amphenol/Pyle part number callouts - aluminum/stainless steel only. (See how to order pages 7, 8 and 21).



MIL-C-26500

aluminum/stainless steel, threaded/bayonet coupling

THREADED COUPLING

PYLE ZZY

MS2426X()TXX

Shell Style (Stainless Steel pictured)	Basic Performance Level	Hardware Description*	Class*	Basic Part Number**
 Square Flange Mounted Receptacle Threaded Coupling	General Purpose, Environmental Resistant	Aluminum	Military Class R or G	MS24264(R or G)XXTXX
			Pyle A or M Series	ZZY-(A or M)X-17XX
	Superior Strength, Corrosion Resistance up to 204°C (399°F)	Stainless Steel	Military Class E	MS24264EXXTXX
			Pyle R Series	ZZY-RX-17XX
 Single Hole (D-Hole) Mounted Receptacle Threaded Coupling	General Purpose, Environmental Resistant	Aluminum	Military Class R or G	MS24265(R or G)XXTXX
			Pyle A or M Series	ZZY-(A or M)X-15XX
	Superior Strength, Corrosion Resistance up to 204°C (399°F)	Stainless Steel	Military Class E	MS24265EXXTXX
			Pyle R Series	ZZY-RX-15XX
 Straight Plug Threaded Coupling	General Purpose, Environmental Resistant	Aluminum	Military Class R or G	MS24266(R or G)XXTXX
			Pyle A or M Series	ZZY-(A or M)X-10XX
	Superior Strength, Corrosion Resistance up to 204°C (399°F)	Stainless Steel	Military Class E	MS24266EXXTXX
			Pyle R Series	ZZY-RX-10XX

BAYONET COUPLING

PYLE ZZW

MS2426X()BXX

Shell Style (Stainless Steel pictured)	Basic Performance Level	Hardware Description*	Class*	Basic Part Number**
 Square Flange Mounted Receptacle Bayonet Coupling	General Purpose, Environmental Resistant	Aluminum	Military Class R or G	MS24264(R or G)XXBXX
			Pyle A or M Series	ZZW-(A or M)X-17XX
	Superior Strength, Corrosion Resistance up to 204°C (399°F)	Stainless Steel	Military Class E	MS24264EXXTXX
			Pyle R Series	ZZW-RX-17XX
 Single Hole (D-Hole) Mounted Receptacle Bayonet Coupling	General Purpose, Environmental Resistant	Aluminum	Military Class R or G	MS24265(R or G)XXBXX
			Pyle A or M Series	ZZW-(A or M)X-15XX
	Superior Strength, Corrosion Resistance up to 204°C (399°F)	Stainless Steel	Military Class E	MS24265EXXTXX
			Pyle R Series	ZZW-RX-15XX
 Straight Plug Bayonet Coupling	General Purpose, Environmental Resistant	Aluminum	Military Class R or G	MS24266(R or G)XXBXX
			Pyle A or M Series	ZZW-(A or M)X-10XX
	Superior Strength, Corrosion Resistance up to 204°C (399°F)	Stainless Steel	Military Class E	MS24266EXXTXX
			Pyle R Series	ZZW-RX-10XX

NA designates not available

* See how to order, page 7, for further description of hardware classes.

** See how to order, page 7, to complete part numbers.

MIL-C-26500

aluminum/stainless steel

ratchet lock coupling

RATCHET LOCK PLUG

PYLE ZZY

Shell Style (Stainless steel only)	Basic Performance Level	Hardware Description*	Class*	Basic Part Number**
 Ratchet Lock Plug Non-Decoupling	Superior Strength, Corrosion Resistance up to 204°C (399°F) Employs ratchet feature in last 180° of rotation to eliminate need for safety-wiring	Stainless Steel only	Pyle R Series (Proprietary only)	ZZY-RX-12XX

* See how to order, page 7, for further description of hardware classes.

** See how to order, page 7, to complete part numbers.

RATCHET LOCK PLUG & MATING FLANGE MOUNTED, THREADED RECEPTACLE

PYLE ZZY

Shell Style (Stainless steel pictured)	Basic Performance Level	Hardware Description*	Class*	Pyle Basic Part Number**
 Ratchet Lock Plug Non-Decoupling	Designed to meet high vibration requirements beyond MIL-C-26500.	Aluminum	Pyle A Series	ZZY (A or F) X-12 (D, E or F) XX
		Stainless Steel	Pyle R Series	ZZY-RX-12 (D, E or F)XX
 Square Flange Mounted Receptacle Threaded Coupling	Designed to meet high vibration requirements beyond MIL-C-26500.	Aluminum	Pyle A Series	ZZY (A or F) X-17(D, E or F) XX
		Stainless Steel	Pyle R Series	ZZY-RX-17 (D, E or F) XX

* See how to order, page 8, for further description of hardware classes.

** See how to order, page 8, to complete part numbers.

MIL-C-26500 – how to order

Military Designation

Sample ordering number:

MS24266 R 22 T 55 P 6

Shell Style

MS24264 – Square Flange Receptacle
MS24265 – Single Hole Mounting Receptacle
MS24266 – Straight Plug

Class

R – Aluminum, non-conductive (black anodize finish)
G – Aluminum, conductive (chromium finish)
E – Stainless steel, passivated

Shell Size

8, 10, 12, 14, 16, 18, 20, 22, 24

- **Alternate Keying**

6, 7, 8, 9, Y (N for normal) See page 4

Contact Type

$$P_{in} - P$$

Socket – S

Insert Arrangement

(See chart, page 4)

Coupling Type

Threaded – T

Bayonet – B

Amphenol®/Pyle-National® Designation

Sample ordering number:

ZZY – A C – 10 22 – 55 P 06 D – HXX

Shell Style

ZZY – Threaded Coupling
ZZW – Bayonet Coupling

Class

A – Aluminum, non-conductive (black anodize finish)
M– Aluminum, conductive (chromium finish)
R – Stainless steel, passivated

Accessories*

No Digit – with contacts and cable support
C – without cable support, with contacts
D – without contacts, with cable support
O – without contacts or cable support

Shell Style

10 – Straight Plug
12 – Non-Decoupling (Ratchet Lock)
15 – Single Hole Mounting Receptacle
17 – Square Flange Receptacle

Variations

Hardware Deviation – HXX

Insert Deviation – AXX

- **Contact Plating**

Gold – D

Rhodium – T

Alternate Keying

06, 07, 08, 09, 10 (omit for normal) See page 4

Contact Type

$$P_{in} - P$$

Socket – S

- Insert Arrangement

See chart, page 4

Shell Size

8, 10, 12, 14, 16, 18, 20, 22, 24, 28

* Accessory threads for aluminum and stainless steel hardware differ, and care should be taken in selection of alternate accessory hardware that will conform to the threads noted in the dimensional tables within this catalog.

MIL-C-26500 – how to order

aluminum/stainless steel,
ratchet lock plug, mating flange receptacle

Amphenol®/Pyle® connectors are specifically designed to meet high vibration requirements above and beyond the specification requirements of MIL-C-26500. The plug connector features a unique non-decoupling device which offers a ratchet mechanism designed to engage as the threaded connectors approach a bottomed condition. Connector coupling assembly continues to ratchet for approximately 120 degrees until the mated connectors reach a complete metal-to-metal bottomed condition. The ratchet device maintains the connectors in a fully coupled condition, thus eliminating the need for safety wiring.

Additional features include:

- Modified accessory thread to accommodate MIL-C-83723 back-shell hardware.
- Rear accessory teeth are featured on both the plug and receptacle shell to assure non-rotation of accessory hardware
- Intermateable with all MIL-C-26500 threaded connectors of like insert arrangement and key position

Amphenol®/Pyle-National® Designation

Sample ordering number:

ZZY – A C – 12 D 14 – 04 P 06 D

Shell Style

ZZY – Threaded Coupling

Series

A – Anodized Aluminum Shell

R – Stainless Steel, passivated

F – Clear Cadmium plated Aluminum Shell

Contacts & Accessories

No Digit – with contacts, with clamp

C – with contacts

O – without contacts

Shell Style

12 – Non-Decoupling Plug, Ratchet Lock

17 – Square Flange Receptacle

- **Contact Finish**

Gold plate per MIL-C-39029 – D

Rhodium plate per MIL-C-26636 – T

Alternate Key Position

06, 07, 08, 09, 10 (omit for normal)

See page 4

Contact Type

$$P_{in} - P$$

Socket – S

Insert Arrangement

See chart, page 4

- **Shell Size**

10, 12, 14, 16, 18, 20, 22, 24, 28

Accessory Size*

Rear accessories per MIL-C-83723 – D

Rear accessories per MS 3155 – E

Rear accessories per MS 3155 with EMI Band – F

* Accessory threads for aluminum and stainless steel hardware differ, and care should be taken in selection of alternate accessory hardware that will conform to the threads noted in the dimensional tables within this catalog.

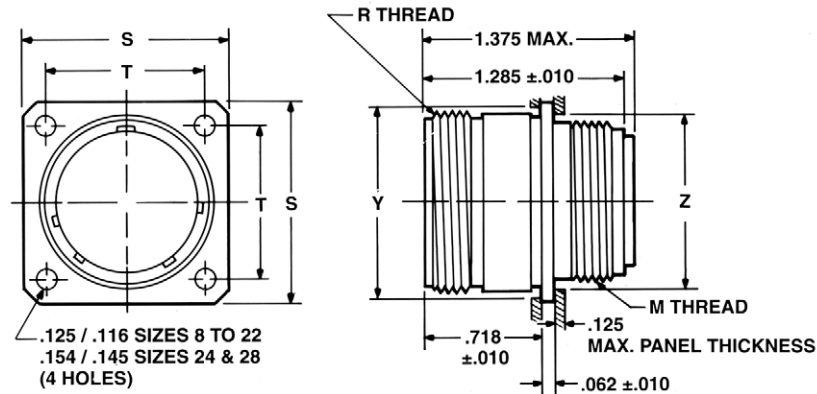
Flange Mounted Receptacle

aluminum/stainless steel

threaded coupling



STAINLESS STEEL
Pyle ZZY-RC-17XX* Series
MS24264EXXTXX*
Military Class E



ALUMINUM
Pyle ZZY-AC-17XX* Series
MS24264RXXTXX*
Military Class R

* To complete order number,
see how to order, page 7.

Shell Size	Cable Support Thread M		Aluminum Connector Weight (lbs.) max including Contacts		Coupling Thread R	Flange Width S ±.005	Mounting Hole Centers T ±.005	Back Mount Min. Hole Y	Front Mount Min. Hole Z
	Steel NS-2A	Alum. UNEF-2A Modified	Pin Insert	Socket Insert					
08**	NA	.437-28	.025	.026	.562-24	.812	.594	.606	.443
10	.563-36	.562-24	.042	.044	.687-24	.937	.719	.748	.572
12	.733-36	.750-20	.061	.062	.875-20	1.031	.812	.913	.760
14	.803-36	.812-20	.072	.074	.937-20	1.125	.906	.980	.822
16	.930-36	.937-20	.087	.090	1.062-18	1.250	.969	1.107	.948
18	1.036-36	1.062-18	.110	.112	1.187-18	1.343	1.062	1.209	1.072
20	1.161-36	1.187-18	.130	.134	1.312-18	1.437	1.156	1.325	1.197
22	1.286-36	1.312-18	.152	.159	1.437-18	1.562	1.250	1.452	1.322
24	1.411-36	1.437-18	.181	.188	1.562-18	1.703	1.375	1.577	1.448
28†	1.661-36	NA	NA	NA	1.812-16	2.000	1.562	1.827	1.700

NA designates not available. ** Not available in Stainless Steel. † Not available in Aluminum.
All dimensions for reference only.

D-Hole Mounted Receptacle

aluminum/stainless steel

threaded coupling



STAINLESS STEEL
Pyle ZZY-RC-15XX* Series
MS24265EXXTXX*
Military Class E

ALUMINUM
Pyle ZZY-AC-15XX* Series
MS24265RXXTXX*
Military Class R

* To complete order number,
see how to order, page 7.

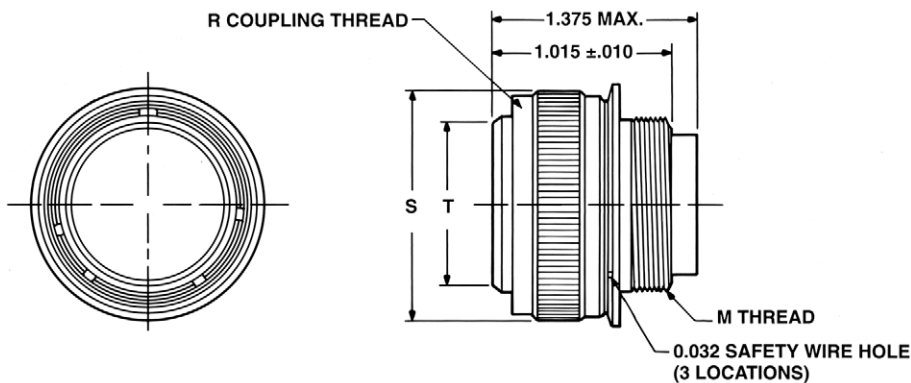
Shell Size	Cable Support Thread M		Aluminum Connector Weight (lbs.) max including Contacts		Coupling Thread R	Flange Width S ±.005	Lock Nut Flats T		Mounting Hole Dia. Y	Mounting Hole Flat Z	Rec. min. Torque Jam Nut Inch/Lbs.
	Steel NS-2A	Alum. UNEF-2A Modified	Pin Insert	Socket Insert			Steel	Alum.			
08	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10	.563-36	.562-24	.049	.050	1.171-24	1.104	.937	.937	.760	.730	36
12**	NA	.750-20	.069	.070	.875-20	1.291	1.125	1.125	.947	.917	56
14	.803-36	.812-20	.087	.089	.937-20	1.391	1.062	1.187	1.010	.980	65
16	.930-36	.937-20	.104	.106	1.062-18	1.516	1.187	1.312	1.135	1.105	69
18	1.036-36	1.062-18	.131	.133	1.187-18	1.614	1.312	1.437	1.260	1.225	81
20	NA	NA	.152	.157	NA	NA	NA	NA	NA	NA	100
22	1.286-36	1.312-18	.181	.187	1.312-18	1.954	1.562	1.687	1.510	1.475	123
24	1.411-36	1.437-18	.208	.212	NA	NA	NA	NA	NA	NA	133
28	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NA designates not available. ** Not available in Stainless Steel.
All dimensions for reference only.

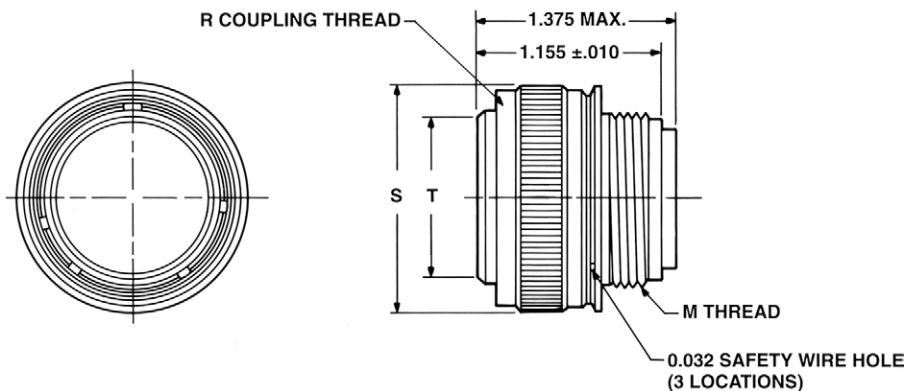
Straight Plug

aluminum/stainless steel

threaded coupling



STAINLESS STEEL
Pyle ZZY-RC-10XX* Series
MS24266EXXTXX*
Military Class E



ALUMINUM
Pyle ZZY-AC-10XX* Series
MS24266RXXTXX*
Military Class R

* To complete order number, see how to order, page 7.

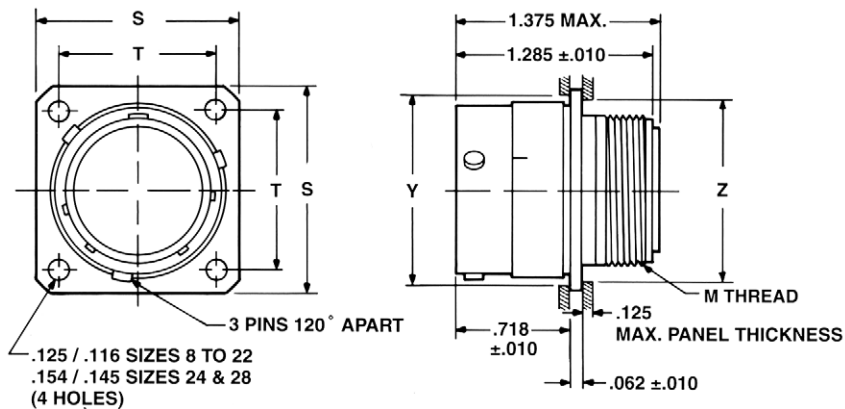
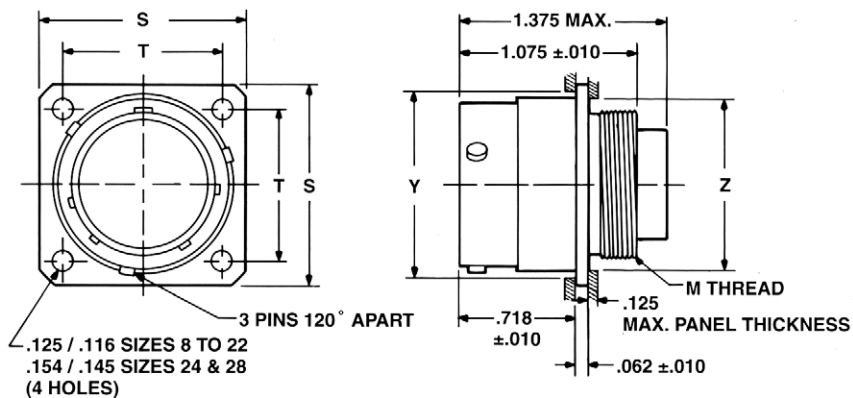
Shell Size	Cable Support Thread M		Aluminum Connector Weight (lbs.) max including Contacts		Coupling Thread R	Coupling Nut Dia S Max.		Shell Dia. T +.000 -.005
	Steel NS-2A	Alum. UNEF-2A Modified	Pin Insert	Socket Insert		Steel	Alum.	
08**	NA	.437-28	.030	.031	.562-24	NA	.776	.424
10	.563-36	.562-24	.044	.045	.687-24	.826	.906	.526
12	.733-36	.750-20	.063	.064	.875-20	.996	1.078	.696
14	.803-36	.812-20	.074	.076	.937-20	1.066	1.141	.765
16	.930-36	.937-20	.091	.094	1.062-18	1.193	1.266	.892
18	1.036-36	1.062-18	.110	.112	1.187-18	1.299	1.375	.998
20	1.161-36	1.187-18	.133	.136	1.312-18	1.424	1.510	1.123
22	1.286-36	1.286-18	.154	.160	1.437-18	1.549	1.625	1.248
24	1.411-36	1.437-18	.184	.188	1.562-18	1.674	1.670	1.373
28†	1.661-36	NA	NA	NA	1.812-16	1.912	NA	1.623

NA designates not available. ** Not available in Stainless Steel. † Not available in Aluminum.
All dimensions for reference only.

Flange Mounted Receptacle

aluminum/stainless steel

bayonet coupling



* To complete order number,
see how to order, page 7.

Shell Size	Cable Support Thread M		Aluminum Connector Weight (lbs.) max including Contacts		Flange Width S ±.005	Mounting Hole Centers T ±.005	Back Mount Min. Hole Y	Front Mount Min. Hole Z
	Steel NS-2A	Alum. UNEF-2A Modified	Pin Insert	Socket Insert				
08**	NA	.437-28	.025	.026	.812	.594	.606	.443
10	.563-36	.562-24	.042	.044	.937	.719	.748	.572
12	.733-36	.750-20	.061	.062	1.031	.812	.913	.760
14	.803-36	.812-20	.072	.074	1.125	.906	.980	.822
16	.930-36	.937-20	.087	.090	1.250	.969	1.107	.948
18	1.036-36	1.062-18	.110	.112	1.343	1.062	1.209	1.072
20	1.161-36	1.187-18	.130	.134	1.437	1.156	1.325	1.197
22	1.286-36	1.312-18	.152	.159	1.562	1.250	1.452	1.322
24**	NA	1.437-18	.181	.188	1.703	1.375	1.577	1.447
28	NA	NA	NA	NA	NA	NA	NA	NA

NA designates not available. ** Not available in Stainless Steel.
All dimensions for reference only.

D-Hole Mounted Receptacle

aluminum/stainless steel

bayonet coupling



STAINLESS STEEL
Pyle ZZW-RC-15XX* Series
MS24265EXXBXX*
Military Class E

ALUMINUM
Pyle ZZW-AC-15XX* Series
MS24265RXBX*
Military Class R

* To complete order number, see how to order, page 7.

Shell Size	Cable Support Thread M		Aluminum Connector Weight (lbs.) max including Contacts		Flange Width S ±.005	Lock Nut Flats T		Mounting Hole Dia. Y	Mounting Hole Flat Z	Recom. min. Torque Jam Nut Lb. - inches
	Steel NS-2A	Alum. UNEF-2A Modified	Pin Insert	Socket Insert		Steel	Alum.			
08**	NA	.437-28	.029	.030	.979	NA	.812	.635	.605	33
10	.563-36	.562-24	.049	.050	1.104	.937	.937	.760	.730	36
12**	NA	.750-20	.069	.070	1.291	1.125	1.125	.947	.917	56
14	.803-36	.812-20	.087	.089	1.391	1.062	1.187	1.010	.980	65
16	.930-36	.937-20	.104	.106	1.561	1.187	1.312	1.135	1.105	69
18	1.036-36	1.062-18	.131	.133	1.641	1.312	1.437	1.260	1.225	81
20	1.161-36	1.187-18	.152	.157	1.766	1.562	NA	1.385	1.350	100
22	1.286-36	1.312-18	.181	.187	1.954	1.585	1.687	1.510	1.475	123
24	1.411-36	1.437-18	.208	.212	2.079	1.687	1.812	1.635	1.600	133
28	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NA designates not available. ** Not available in Stainless Steel.
All dimensions for reference only.

Straight Plug

aluminum/stainless steel

bayonet coupling



STAINLESS STEEL
Pyle ZZW-RC-10XX* Series
MS24266EXXBXX*
Military Class E



ALUMINUM
Pyle ZZW-AC-10XX* Series
MS24266RXXBXX*
Military Class R

* To complete order number,
see how to order, page 7.

Shell Size	Cable Support Thread M		Aluminum Connector Weight (lbs.) max including Contacts		Coupling Nut Dia S Max.		Shell Dia. T +.000 -.005
	Steel NS-2A	Alum. UNEF-2A Modified	Pin Insert	Socket Insert	Steel	Alum.	
08**	NA	.437-28	.030	.031	NA	.762	.424
10	.563-36	.562-24	.044	.045	.848	.904	.526
12	.733-36	.750-20	.063	.064	1.018	1.076	.696
14	.803-36	.812-20	.074	.076	1.087	1.122	.765
16	.930-36	.937-20	.091	.094	1.214	1.264	.892
18	1.036-36	1.062-18	.110	.112	1.320	1.373	.998
20	1.161-36	1.187-18	.133	.136	1.445	1.503	1.123
22	1.286-36	1.312-18	.154	.160	1.570	1.623	1.248
24	1.411-36	1.437-18	.184	.188	1.695	1.752	1.373
28	NA	NA	NA	NA	NA	NA	NA

NA designates not available. ** Not available in Stainless Steel.
All dimensions for reference only.

Non-Decoupling, Ratchet Lock Plug

stainless steel

ratchet lock coupling



STAINLESS STEEL
Pyle ZZY-RC-12XX* Series
Military Class E

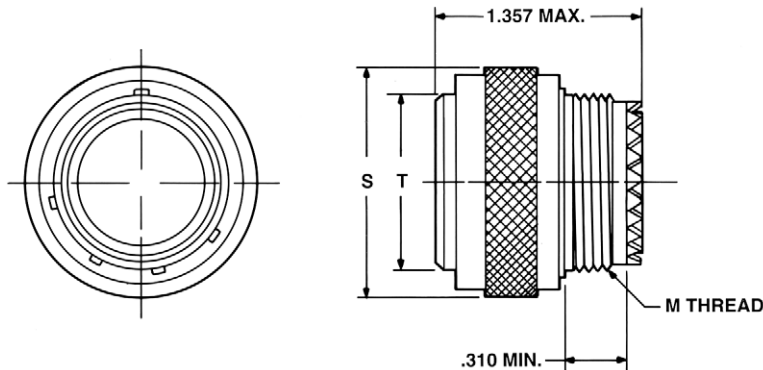
* To complete order number, see how to order, page 7.

Shell Size	Cable Support Thread M	Coupling Thread R	Coupling Nut Dia S	Shell Dia. T
08	NA	NA	NA	NA
10	.563-36	.687-24	.931	.526
12	.733-36	.875-20	1.111	.696
14	.803-36	.937-20	1.175	.765
16	.930-36	.812-20	1.302	.892
18	1.036-36	.937-20	1.408	.998
20	NA	NA	NA	NA
22	1.286-36	1.437-18	1.658	1.248
24	1.411-36	1.562-18	1.783	1.373
28	1.661-36	1.812-16	2.038	1.623

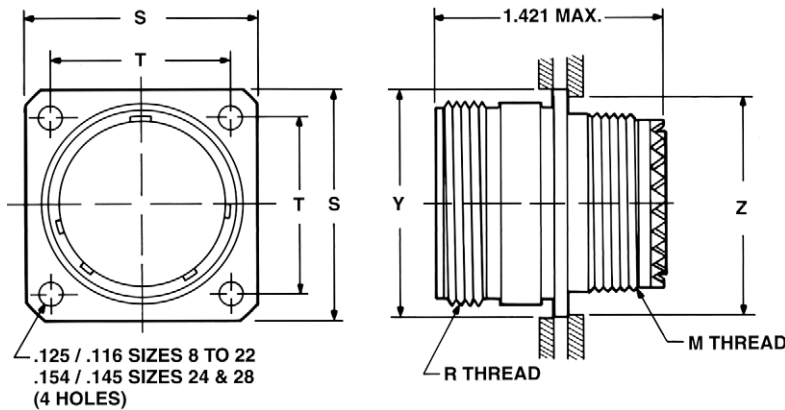
NA designates not available.
All dimensions for reference only.

Ratchet Lock Plug and Mating Flange Receptacle

aluminum/stainless steel
ratchet lock coupling



RATCHET LOCK PLUG
Stainless Steel/Aluminum
Pyle ZZY-RC/AC-12XX* Series



**MATING FLANGE MOUNTED,
THREADED RECEPTACLE**
Stainless Steel/Aluminum
Pyle ZZY-RC/AC-17XX* Series

* To complete order number,
see how to order, page 8.

Shell Size	Cable Support Thread M	Plug		Receptacle				
		Coupling Nut Dia. S Max.	Shell Dia. T $+.000$ $-.005$	Coupling Thread R	Flange Width S $\pm .005$	Mounting Hole Centers T $\pm .005$	Back Mount Hole (min.) Y	Front Mount Hole (min.) Z
08	NA	NA	NA	NA	NA	NA	NA	NA
10	.6250-24	.945	.526	.6875-24	.937	.719	.706	.635
12	.7500-20	1.165	.696	.8750-20	1.031	.812	.885	.760
14	.8750-20	1.230	.765	.9375-20	1.125	.906	.947	.885
16	1.0000-20	1.353	.892	1.0625-18	1.250	.969	1.072	1.010
18	1.0625-18	1.468	.998	1.1875-18	1.343	1.062	1.197	1.072
20	1.1875-18	1.607	1.123	1.3125-18	1.437	1.156	1.322	1.197
22	1.3125-18	1.733	1.248	1.4375-18	1.562	1.250	1.447	1.322
24	1.4375-18	1.858	1.373	1.5625-18	1.703	1.375	1.572	1.448
28	1.7500-18	2.113	1.623	1.8120-16	2.000	1.562	1.822	1.760

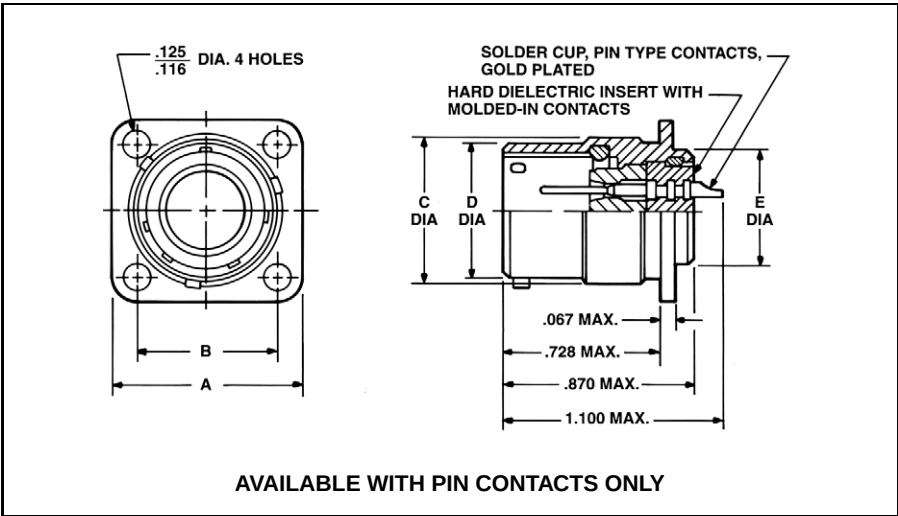
NA designates not available.
All dimensions for reference only.

MIL-C-26500 – 48 Series

receptacle short skirt

Receptacle Short Skirt – Aluminum – Bayonet Coupling

Shorter, lighter, and more economical than the standard MIL-C-26500 connector receptacles, the 48 Series receptacle short skirt comes in two versions: with standard flange and with reduced flange. Both versions are 1.100" long which is .275" shorter than the length of the standard MIL-C-26500 connector. They have molded epoxy fiberglass inserts and can operate continuously up to 125°C (257°F), but otherwise they offer the same environmental sealing, from the panel out, as standard MIL-C-26500 connectors. They have bayonet coupling and mate with standard MIL-C-26500 plugs. The hard dielectric inserts, with resilient face seal and molded-in gold plated solder cup pin contacts, are available in insert arrangements shown in the chart below.



Receptacle Short Skirt with Standard Flange

Insert Arrangement	Amphenol Part Number*	A ±.005	B ±.005	C Max.	D +.000 -.005	E Max.
10-5	48-7115-XX	.937	.719	.696	.659	.562
12-3	48-7116-XX	1.031	.812	.875	.829	.750
12-12	48-7117-XX	1.031	.812	.875	.829	.750
14-4	48-7118-XX	1.125	.906	.935	.898	.812
14-7	48-7119-XX	1.125	.906	.935	.898	.812
14-15	48-7120-XX	1.125	.906	.935	.898	.812
16-24	48-7121-XX	1.250	.969	1.062	1.025	.938
18-8	48-7122-XX	1.343	1.062	1.187	1.131	1.062
18-14	48-7123-XX	1.343	1.062	1.187	1.131	1.062
18-31	48-7124-XX	1.343	1.062	1.187	1.131	1.062
20-25	48-7251-XX	1.437	1.156	1.312	1.256	1.182
20-28	48-7175-XX	1.437	1.156	1.312	1.256	1.182
22-12	48-7125-XX	1.562	1.250	1.437	1.381	1.312
22-19	48-7126-XX	1.562	1.250	1.437	1.381	1.312
22-55	48-7127-XX	1.562	1.250	1.437	1.381	1.312

Receptacle Short Skirt with Reduced Flange

Insert Arrangement	Amphenol Part Number*	A Max.	B ±.005	C Max.	D +.000 -.005	E Max.
10-5	48-7132-XX	.870	.647	.696	.659	.562
12-3	48-7133-XX	.996	.773	.875	.829	.750
12-12	48-7134-XX	.996	.773	.875	.829	.750

* To complete part number: Replace XX with alternate keying positions (omit for normal position). See page 4.

MIL-C-26500 – 48 Series

wire splice connector

Special Application Wire Splice Connector

The Amphenol® 48 Series wire splice connector is a low cost, space-saving connector design that can be used for various design applications. The push-mating/twist-pull-unmating feature provides a simple solution to many design requirements without sacrificing performance. This wire splice connector utilizes a metal retention clip for a single size 16 pin and socket contact.

Features and benefits include:

- Push-mating/twist-pull-unmating
- Uses standard M39029/31-229 pin and M39029/32-248 socket contacts
- Incorporates environmental sealing grommet
- Metal collet retention
- Uses standard MIL-C-26500 contact removable tools
- Low cost
- Weight savings design
- Space savings design
- Color coded connector halves - red or blue



Receptacle Wire Splice

Amphenol 48 Series Part Number	Amphenol 10- Part Number	Color	Size 16 Contact Part Number
48-7191	10-804342	Blue	Pin ZZL-4016-36LD
48-7191-1	10-804342-1	Red	Socket ZZL-4116-36LD



Plug Wire Splice

Amphenol 48 Series Part Number	Amphenol 10- Part Number	Color	Size 16 Contact Part Number
48-7190	10-804341	Blue	Pin ZZL-4016-36LD
48-7190-1	10-804341-1	Red	Socket ZZL-4116-36LD

MIL-C-26500 – Firewall Class K

Class K stainless steel threaded coupling

THREADED COUPLING, FIREWALL PYLE FPK, FPL, FP5K MS2761X-KXXTXX

Shell Style (Firewall stainless steel only)	Basic Performance Level	Hardware Description*	Class*	Basic Part Number**
 Square Flange Mounted Receptacle Threaded Coupling	High performance. Environmentally sealed. Resists high temperatures up to 238°C (460°F).	Class K Firewall Stainless Steel	Military Class K	MS27613-KXXTXX
			Pyle FPK or FPL or FP5K Series	FPK-17() or FPL-17() or FP5K-17()
 Single Hole (D-Hole) Mounted Receptacle Threaded Coupling	High performance. Environmentally sealed. Resists high temperatures up to 238°C (460°F).	Class K Firewall Stainless Steel	Military Class K	MS27614-KXXTXX
			Pyle FPK or FPL or FP5K Series	FPK-19() or FPL-19() or FP5K-19()
 Straight Plug Threaded Coupling	High performance. Environmentally sealed. Resists high temperatures up to 238°C (460°F).	Class K Firewall Stainless Steel	Military Class K	MS27615-KXXTXX
			Pyle FPK or FPL	FPK-11() or FPL-11()
 Ratchet Locking Plug Threaded Coupling	High performance. Environmentally sealed. Resists high temperatures up to 238°C (460°F).	Class K Firewall Stainless Steel	Military Class K	MS27615KXXSXX
			Pyle FPK or FPL or FP5K Series	FPK-12() or FPL-12() or FP5K-12()

* See how to order, page 21, for further description of hardware classes.

** See how to order, page 21, to complete part numbers.

MIL-C-26500 – Firewall Class K

Class K stainless steel bayonet coupling

BAYONET COUPLING, FIREWALL
PYLE FYL
MS2761X-KXXBXX

Shell Style (Firewall stainless steel only)	Basic Performance Level	Hardware Description*	Class*	Basic Part Number**
 Square Flange Mounted Receptacle Bayonet Coupling	High performance. Environmentally sealed. Resists high temperatures up to 238°C (460°F).	Class K Firewall Stainless Steel	Military Class K	MS27613-KXXBXX
			Pyle FYL Series	FYL-17 ()
 Single Hole (D-Hole) Mounted Receptacle Bayonet Coupling	High performance. Environmentally sealed. Resists high temperatures up to 238°C (460°F).	Class K Firewall Stainless Steel	Military Class K	MS27614-KXXBXX
			Pyle FYL Series	FYL-19 ()
 Straight Plug Bayonet Coupling	High performance. Environmentally sealed. Resists high temperatures up to 238°C (460°F).	Class K Firewall Stainless Steel	Military Class K	MS27615-KXXBXX
			Pyle FYL Series	FYL-11 ()

* See how to order, page 21, for further description of hardware classes.

** See how to order, page 21, to complete part numbers.

MIL-C-26500 – Firewall, Class K

how to order

Class K stainless steel,
threaded/bayonet/ratchet lock coupling

Military Designation
Sample ordering number:

MS27613 K 14 T 7 P 6 – D

Shell Type
MS27613 – Square Flange Receptacle
MS27614 – Single Hole Mounting Receptacle
MS27615 – Straight Plug

Class K – Firewall – Stainless steel, passivated

Shell Size
12, 14, 16, 18, 22, 24, 28

Coupling Type
B – Bayonet
S – Ratchet Locking Thread
T – Standard Threaded

Cable Support
Long (MS27658) – D
Short (MS27657) – P
Right Angle (MS27659) – J
(omit for no support)

Alternate Keying
6, 7, 8, 9, Y (omit for normal) See page 4

Contact Type
Pin – P
Socket – S

Insert Arrangement
See chart, page 4

Amphenol®/Pyle-National® Designation
Sample ordering number:

FPK – 11 28 – 42 S T 06 – D – WXX

Connector Type
FPK – Threaded Coupling, qualified to MIL-C-26500 and BACC63 Series
FPL – Threaded Coupling, same as FPK, but used on Lockheed Aircraft
FP5K – Threaded Coupling, qualified for General Electric
FYL – Bayonet Coupling, qualified to MIL-C-26500

Shell Type
11 – Straight Plug
12 – Ratchet Locking Threaded Plug
13 – Improved Non-Decoupling Plug
17 – Square Flange Receptacle
19 – D-Hole Mounting Receptacle

Shell Size
12, 14, 16, 18, 22, 24, 28

Insert Arrangement
See chart, page 4

Variations
Insert – W
Hardware – Y
Standard for Plug Bayonet Hardware – Y19

Cable Support
Long – D
Short – P
Right Angle – J
(omit for no support)

Alternate Keying
06, 07, 08, 09, Y (omit for normal) See page 4

Contact Style
No Contacts – E
Rhodium – T
Gold Contacts – D

Contact Type
Pin – P
Socket – S

Boeing Company Designation
Sample ordering number:

BAC C 63X 14 – 07 P 6

Boeing Aircraft Company
Electrical Connector

Shell Type
63X – Plug, Threaded, Fire Barrier
63Y – Receptacle, Threaded Fire Barrier
63AE – Plug, Threaded, for use with No. 20 Wire Fire Barrier
63AF – Receptacle, Flange Mount, Threaded, Fire Barrier, For use with No. 20 Wire Fire Barrier.
Note: AE & AF require W11 variation on Pyle Number.

Alternate Keying
6, 7, 8, 9, Y, (omit for normal) See page 4

Contact Type
Pin – P
Socket – S

Insert Arrangement
See chart, page 4

Accessories
To order with D Cable Clamp, replace – with Letter C

Shell Size
12, 14, 16, 18, 22, 24, 28

Firewall Class K Flange Mounted Receptacle

Class K stainless steel,
threaded/bayonet coupling



THREADED COUPLING
Class K Stainless Steel
Pyle FPK-17XX* Series
MS27613KXXTXX*
Military Class K



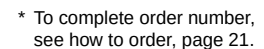
BAYONET COUPLING
Class K Stainless Steel
Pyle FYL-17XX* Series
MS27613KXXBXX*
Military Class K

* To complete order number,
see how to order, page 21.

Shell Size	Cable Support Thread M	Coupling Thread R	Flange Width S ±.005	Mounting Hole Centers T ±.005	Back Mount Min. Hole Y	Front Mount Min. Hole Z
08	NA	NA	NA	NA	NA	NA
10	NA	NA	NA	NA	NA	NA
12**	.733-36	.875-20	1.031	.812	.913	.760
14	.803-36	.937-20	1.125	.906	.980	.822
16	.930-36	1.062-18	1.250	.969	1.107	.948
18	1.036-36	1.187-18	1.343	1.062	1.209	1.072
20	NA	NA	NA	NA	NA	NA
22	1.286-36	1.437-18	1.562	1.250	1.452	1.322
24**	1.411-36	1.562-18	1.703	1.375	1.577	1.422
28**	1.661-36	1.812-16	2.000	1.562	1.827	1.700

NA designates not available. ** Available in Threaded Coupling only.
All dimensions for reference only.

Class K stainless steel, threaded/bayonet coupling



NA designates not available. ** Available in Threaded Coupling only.
All dimensions for reference only.

Firewall Class K Straight Plug

Class K stainless steel,
threaded/bayonet coupling



THREADED COUPLING
Class K Stainless Steel
Pyle FPK-11XX* Series
MS27615KXXTXX*
Military Class K



BAYONET COUPLING
Class K Stainless Steel
Pyle FYL-11XX* Series
MS27615KXXBXX*
Military Class K

* To complete order number,
see how to order, page 21.

Shell Size	Cable Support Thread M	Coupling Thread R	Coupling Nut		Shell Dia. T
			Dia. S¹	Dia. S²	
08	NA	NA	NA	NA	NA
10	NA	NA	NA	NA	NA
12	.733-36	.875-20	.984	1.018	.696
14	.803-36	.937-20	1.054	1.087	.765
16	.930-36	1.062-18	1.181	1.214	.892
18	1.036-36	1.187-18	1.287	1.320	.998
20	NA	NA	NA	NA	NA
22	1.286-36	1.437-18	1.537	1.570	1.248
24	1.411-36	1.562-18	1.662	1.695	1.373
28**	1.661-36	1.812-16	1.912	NA	1.623

NA designates not available. ** Available in Threaded Coupling only.
All dimensions for reference only.

Firewall Class K Ratchet Lock Plug, Class K stainless steel, threaded coupling



RATCHET LOCK PLUG
 Threaded Coupling
 Class K Stainless Steel
 Pyle FPK-12XX* Series
 MS27615KXXSXX
 Military Class K

* To complete order number,
 see how to order, page 21.

Shell Size	Cable Support Thread M	Coupling Thread R	Coupling Nut Dia S	Shell Dia. T
08	NA	NA	NA	NA
10	.563-36	.687-24	.931	.526
12	.733-36	.875-20	1.111	.696
14	.803-36	.937-20	1.175	.765
16	.930-36	1.062-18	1.302	.892
18	1.036-36	1.187-18	1.408	.998
20	NA	NA	NA	NA
22	1.286-36	1.437-18	1.658	1.248
24	1.411-36	1.562-18	1.783	1.373
28	1.661-36	1.812-16	2.038	1.623

NA designates not available.
 All dimensions for reference only.

Hermetic MIL-C-26500 Connectors

hermetically sealed

Amphenol®/Pyle® is an experienced supplier of highly reliable hermetic connectors for the aircraft industry. Amphenol's ZZL and ZZB series of hermetic receptacles are designed to the requirements of MIL-C-26500, and are available in tin-plated cold-rolled steel shells and gold-plated nickel-iron alloy contacts. Other material variations, including stainless steel, are available.

Hermetic receptacles are available in shell sizes 8, 10, 12, 14, 16, 18, 22, 24 and 28. The hermetic series is offered in a variety of receptacle shell styles, which include solder mount, square flange and "D" hole mount. These connectors can be ordered with either eyelet, solderwell or printed circuit tail pin contacts.

Consult Amphenol, Sidney, NY for more information on hermetic connectors, and for optional connector designs.



Amphenol®/Pyle® How to Order Designation for Hermetic Connectors

Sample ordering number: **ZZL - HC - 14 12 - 03 P 06 W - H45**

Series Designation
ZZL – Threaded Coupling
ZZB – Bayonet Coupling

Class
HC – Denotes Hermetic Class

Shell Style
14 – Solder Mount Receptacle
15 – Single Hole Mounting Receptacle
17 – Square Flange Receptacle

Shell Size
8, 10, 12, 14, 16, 18, 22, 24, 28

Insert Arrangement
See inserts labeled with an "H" on page 4.

Contact Type
P denotes male pin contacts with standard gold plate

Alternate Key Position
06, 07, 08, 09, 10 (omit for normal)
(See page 4)

Special Modifications
H45 – 304L stainless steel shell
H52 – Tinned termination tails
H56 – Same as standard; gold contacts
H77 – 304L stainless steel shell, Inconel contacts
H127 – Same as H125 except 304L stainless steel shell
H146 – 303 stainless steel shell, 100 microinch gold
H152 – 304L stainless steel shell with individual beads, loose seals
H177 – 303 stainless steel shell, loose seals
H181 – Tin plated contacts

Contact Style
E – designates eyelet
W – designates solderwell
Consult Amphenol, Sidney, NY for ordering information of printed circuit tail contacts.

Contacts and Accessories

for MIL-C-26500 cylindrical connectors

Crimp Contacts per MIL-C-39029 – Copper Alloy, Gold Plating

PIN CONTACTS				
Contact Size	Spec. Number	Bin Code	MS Number	Amphenol/Pyle No.
20	M39029/31	241	MS24254-20P	ZZL-4020-36LD*
16	M39029/31	229	MS24254-16P	ZZL-4016-36LD*
12	M39029/31	235	MS24254-12P	ZZL-4012-36LD*

SOCKET CONTACTS				
Contact Size	Spec. Number	Bin Code	MS Number	Amphenol/Pyle No.
20	M39029/32	260	MS24255-20S	ZZL-4120-36LD*
16	M39029/32	248	MS24255-16S	ZZL-4116-36LD*
12	M39029/32	254	MS24255-12S	ZZL-4112-36LD*

* Add – H139 for Boeing Marking for Pin/Socket, Standard Plating.
Add – H148 for Boeing Marking for Pin/Socket, Select Plate.

Amphenol®/Pyle® Special Application Contacts

Copper Alloy, Rhodium plated Contacts†			
Contact Size	Description	Amphenol/Pyle Pin No.	Amphenol/Pyle Socket No.
20	Copper Alloy/ Rhodium plated	ZZL-4020-36LT	ZZL-4120-36LT
16	Copper Alloy/ Rhodium plated	ZZL-4016-36LT	ZZL-4116-36LT
12	Copper Alloy/ Rhodium plated	ZZL-4012-36LT	ZZL-4112-36LT

† Contacts qualified to Boeing BACC47CN/CP.

Thermocouple Contacts					
Contact Size	Material	Amphenol/Pyle Pin No.	Amphenol/Pyle Socket No.		
			Pencil Clip Design*	Split Tine Design**	Color Code
20	Alumel Chromel Constantan	ZZL-4020-10R	ZZL-4120-10R	ZZY-4120-10R	Green
		ZZL-4020-10P	ZZL-4120-10P	ZZY-4120-10P	White
		ZZL-4020-10N	ZZL-4120-10N	ZZY-4120-10N	Yellow
16	Alumel Chromel Constantan	ZZL-4016-10R	ZZL-4116-10R	ZZY-4116-10R	Green
		ZZL-4016-10P	ZZL-4116-10P	ZZY-4116-10P	White
		ZZL-4016-10N	ZZL-4116-10N	ZZY-4116-10N	Yellow
12	Alumel Chromel Constantan	ZZL-4012-10R	ZZL-4112-10R	ZZY-4112-10P	Green
		ZZL-4012-10P	ZZL-4112-10P	ZZY-4112-10P	White
		ZZL-4012-10N	ZZL-4112-10N	ZZY-4112-10N	Yellow

* Pencil clip socket design - see page 2 for description.

** Split tine socket with napkin ring design - see page 2 for description.

Printed Circuit Board/Wire-Wrap Contacts

A variety of different designs are available; please consult Amphenol, Sidney, NY for more information.

Reel Contacts

2000 contacts per reel (gold or rhodium plated) are available. Consult Amphenol, Sidney, NY for more information.

Sealing Plugs



For sealing spare contact holes. Same sealing plug is used in both plug and receptacle.

Contact Size	Amphenol/Pyle No.	MS Number	Color Code
20	10-405996-20	MS-27488-20	Red
16	10-405996-16	MS-27488-16	Blue
12 & #1 Shielded	10-405996-12	MS-27488-12	Yellow
# 2 Shielded	10-405996-8	MS27187-4	White

Sealing Gaskets

For use with square flange mounted receptacles. Provide waterproofing and pressure sealing features.



Contact Size	Amphenol/Pyle No.
08	ZZL-6508-10D
10	ZZL-6510-10D
12	ZZL-6512-10D
14	ZZL-6514-10D
16	ZZL-6516-10D
18	ZZL-6518-10D
20	ZZL-6520-10D
22	ZZL-6522-10D
24	NA

Cable Supports - Aluminum

Shielded/Coaxial Contacts

for MIL-C-26500 cylindrical connectors

Drawing (See below and on next page)	Shielded Contact Part No./ Contact Type	Cable Stripping Dim.*** +.0156 -.0000			Amphenol Crimp Tools (Center Contact)			Outer Ferrule Crimping Tool††	Cable Application
		A	B	C	Tool	Nest Bushing	Crimp Setting		
Type 1 #1 Shielded	48-1226-02 Pin 48-1227-02 Socket 48-1227-50 Socket	.2189	.0781	.1094	294-268* 294-289**	294-1631	#3	294-529	#22 AWG per MIL-C-7078 Type II and MIL-C-27500-22 KING RG-174/U, -188/U
							#1	294-529	RG-161/U, -179/U, -179A/U, -187/U
	48-1226-57 Pin 48-1227-57 Socket	.2189	.0781	.1094	294-268* 294-289**	294-1631	#1	294-528	Raychem 9530A11
Type 2 #1 Shielded	48-1226-51, -54 Pin 48-1227-51, -54, -56 Socket	.2189	.0313	.1563	294-268* 294-289**	294-1631	#1	294-528	RG-180/U, -180A/U, -180B/U, -195/U
Type 3 #1 Shielded	48-1226-55 Pin 48-1227-55 Socket	.2344	.0313	.1563	294-268* 294-289**	294-1631	#1	294-529	RG-178/U, -178A/U, -178B/U, -196-U
Type 4 #2 Shielded	48-2187-02 Pin 48-2188-02 Socket	.2189	.1094	.1406	294-126** 294-243** 294-1166**† 294-358** 294-268*	294-1014 Turret Head 294-1014 294-1015 299-1630	.030 - .040	294-528	#18, 20, 22 AWG per MIL-C-7078, Type II and MIL-C-27500-18, -20, -22 KING Extruded Jacket
	48-2187-50, -51 Pin 48-2188-50, -51, -53, -54 Socket	.2189	.1094	.1406	294-1166**† 294-358** 294-268*	294-1014 294-1015 294-1630	.030 .040 #3	294-528	RG-180/U, -180A/U, -180B/U, -195/U
Type 5 #2 Shielded	48-2187-52 Pin 48-2188-52 Socket	.3125	.1094	.1406	294-358** 294-268*	294-1015 294-1630	.037 - .041	294-530	RG-59/U and 21-541

* Conforms to MIL-C-22520/2 specification.

** MS3191 tools are inactive for new procurement, but can be used if available.

*** Refer to illustration on page 29.

† Same as 294-126, less positioners.

†† Including Hex Die Set

Shielded Contact Assembly Procedure

Type 1



Step 1	Slide sealing boot or sleeve and outer ferrule onto cable and strip cable as shown at right. After stripping, slide spacer over center conductor as shown for Type 2 and Type 3 . For Type 3 slide spacer under wire braid.	
Step 2	Insert stripped center conductor into contact until wire shows through inspection hole and dielectric (Type 1, Type 4 and Type 5) or spacer (Type 2 and Type 3) butts against contact. Fully seat contact in nest bushing of crimp tool and crimp in one full stroke. (Follow same crimping procedures except use nest bushing crimping tool from table above).	
Step 3	Slightly flair out ends of wire braid to facilitate insertion of inner ferrule of body assembly. Do not comb braid.	
Step 4	Install center contact in body assembly and slide inner ferrule underneath wire braid as shown. Push center contact until it is locked in place in the body assembly. Pull lightly on cable to make sure that contact is securely locked in place.	
Step 5	Slide outer ferrule over braid and up against body as shown. There should be no slack in the wire braid. Crimp the outer ferrule with proper tool from table above. Then for Type 1, Type 3 and Type 5 slide sealing sleeve toward contact until sleeve touches outer ferrule.	
Step 6	Insert the assembled shielded contact into the connector in the same way as the standard contact using applicable insertion tool (see page 28). This completes assembly for Type 1, Type 2, Type 3 and Type 5 .	
Step 7	To complete assembly for Type 4 , push sealing boot into connector grommet until O-ring riser of boot snaps into place and seals the assembly.	

Shielded/Coaxial Contacts, cont.

for MIL-C-26500 cylindrical connectors

Cable Stripping

Strip cable jacket, braid and dielectric to the dimensions shown in the table on page 28. Make all cuts square and sharp, being careful not to nick braid, dielectric, or center conductor when cutting. If conductor ends fray, twist them to their normal lay.



Shielded Contacts after Crimping

Shielded Contact Assembly Procedure, cont.

Type 2	Type 3	Type 4	Type 5

Accessories - contact terminating tools for MIL-C-26500 cylindrical connectors

Contact Crimping Tools



Contact Size	Crimping Tool with Indenters		Adjustable Turret		Checking Gage for Crimping Tool	
	Amphenol/ Pyle No.	Mil. No.	Amphenol/ Pyle No.	Mil. No.	Amphenol/ Pyle No.	Mil. No.
20	TP-201354	M22520/1-01 (Class 1)	TP-201355	M22520/1-02 (Class 1)	TP-201356	M22520/3
16						
12						

Contact Insertion Tools



Contact Size	Insertion Tool			Insertion Tool Replacement Tip & Pin	
	Amphenol/ Pyle No.	Mil. No.	Color Code	Amphenol/ Pyle No.	Mil. No.
20	ZZL-R-9510-A-20	MIL-I-81969/17-9	Red	ZZL-R-9531-A-20	—
16	ZZL-R-9510-16	MIL-I-81969/17-4	Blue	ZZL-R-9531-16	—
12	ZZL-R-9510-12	MIL-I-81969/17-5	Yellow	ZZL-R-9531-12	—

Contact Removal Tools



Contact Size	Removal Tool			Removal Tool Replacement Tip	
	Amphenol/ Pyle No.	Mil. No.	Color Code	Amphenol/ Pyle No.	Mil. No.
20	ZZL-R-9511-20	MS-24256-R-20	Red	ZZL-R-9557-20	—
16	ZZL-R-9511-16	MS-24256-R-16	Blue	ZZL-R-9557-16	—
12	ZZL-R-9511-12	MS-24256-R-12	Yellow	ZZL-R-9557-12	—

Contact Termination

Use table below to determine correct wire stripping length for your wire sizes. When stripping the wire, avoid nicking wires or damaging insulation, as it is a functional part of the sealing system.

Contact Size	Wire Size	Stripping Length
20	20 to 24	.170" – .201"
16	16 to 18	.207" – .238"
12	12 to 14	.207" – .238"

See pages 32 and 33 for assembly instructions for proper contact termination and contact insertion/removal.

Accessories - contact terminating tools for 48 Series MIL-C-26500 connectors

Crimping Tools for Shielded Contacts



Shielded Contact Size	For Crimping Center Contact		For Crimping Outer Ferrule	
	Basic Crimp Tool	Contact Positioner	Basic Crimp Tool (Hex dies included)	Hex Dimension
# 1 Shielded	357-100	294-1631	294-529	.128 Hex
# 2 Shielded		294-1630	294-528	.160 Hex

Standard Crimping Tool for Power Contacts



Basic Crimp Tool		Use with Turret Head
Amphenol Part No.	Military Part No.	
294-542	M22520/1-01	M22520/1-02

Contact Size	Color Code	Wire Size
20	Red	20–22–24
16	Blue	16–18–20
12	Yellow	12–14

Contact Insertion Tools



Contact Size	Amphenol Part No.	Military Part No.
20	294-88	MS2456A20
16	294-96	MS2456A16
#12, # 1 Shielded	294-72	MS2456A12
#2 Shielded	294-128	—

Contact Removal Tools



Contact Size	Amphenol Part No.	Military Part No.
20	294-89	MS2456R20
16	294-97	MS2456R16
#12, # 1 Shielded	294-73	MS2456R12
#2 Shielded	294-127	—

For more information on other tools available consult Amphenol, Sidney, NY.

NOTE: Amphenol and Pyle tools are interchangeable.

Assembly Instructions for MIL-C-26500 Connectors

Contact Termination

Contacts should be crimped to the wire with MS Standard hand crimping tools or specification automatic crimping machines.

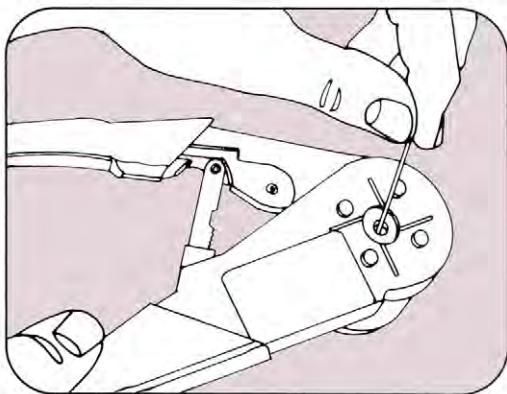
When stripping the wire avoid nicking wires or damaging the insulation as it is a functional part of the sealing system.

Contact Size	Wire Size	Stripping Length
20	20 to 24	.170" – .201"
16	16 to 18	.207" – .238"
12	12 to 14	.207" – .238"

Follow steps 1 – 4, as shown below, for proper contact crimping:



1. Insert stripped wire into contact pocket until it is visible through inspection hole.



2. Carefully seat contact in crimp tool positioner.



3. Crimp in one full stroke. (The ratchet will not release jaws until tool has completed stroke).



4. Inspect crimp for wire visibility through inspection hole.

Assembly Instructions for MIL-C-26500 Connectors, cont.

Contact Insertion into the Connector

The following steps are recommended for assembly.



NOTE:

The Pyle Miniature Connector is designed with a unique sealing principle. Assembly of contacts into the connector must be made with reasonable care to avoid damage to the silicone rubber insert.

1. Lubricate wire cavities in back face of insert with a very thin film of DC-200 Silicone Oil or equal before inserting contacts.
2. Locate contact in insertion tool (as shown in illustration).
3. Align contact with hole in rear face of insert. The alignment of insertion tool with contact must be coaxial with the axis of the connector. When contact has entered rear seal portion of insert, maintain alignment of contact and tool parallel to, and in line with hole. Insert contact to full depth. Seating of the contact in the retention collet is audible. The contact insertion force is less than five pounds.
4. Extract insertion tool, keeping it aligned with hole.

Contact Removal from the Connector

A contact is removed from the connector insert with the extraction tool as follows:



1. Set the spacer sleeve in the proper position for removal of male or female contact.
2. Place tool over the contact and insert into front face of cavity. The alignment of removal tool with contact must be coaxial with axis of connector.
3. Exert a nominal force axially (from 5 to 10 lbs.) to release retention collet. Spacer sleeve will shoulder at front face of insulation when tool is inserted to proper depth.
4. Push extraction plunger to force the contact out of the rear of the insert.
5. Grasp contact or wire at rear face of insert and complete the extraction.
6. Remove extraction tool axially.
7. After using extraction tool the spacer sleeve should be set forward in last notch to protect the end of the plunger guide.

Panel Mounting



Two receptacle shell styles, flange mount and D-hole mount, are available for panel mounting. See the applicable drawings for mounting hole dimensions. The square flange receptacle, sizes 10 through 22, is fastened to the panel with four size #4-40 machine screws. The 24 and 28 size shells are fastened with #6-32 machine screws.

Accessories - cable supports for MIL-C-26500 cylindrical connectors

Cable Supports - Aluminum



Cable clamps support cable or wire at the plug or receptacle and prevent twisting and pulling.

Shell Size	Non-Conductive, Black Anodize Finish		Conductive, Chromium Finish		A Max. Dia.	B $\pm .015$	X I.D. $\pm .38$	Thread UNEF-2B	P Max.
	MS. No.	Amphenol/ Pyle No.	MS No.	Amphenol/ Pyle No.					
08	MS27291-13	ZZL-R-5308-A	MS27291-701	ZZL-M-5308	.582	.935	.180	.4375-28	.785
10	MS27291-1	ZZL-R-5310-A	MS27291-101	ZZL-M-5310	.731	.935	.270	.5625-24	.914
12	MS27291-2	ZZL-R-5312-A	MS27291-201	ZZL-M-5312	.919	.935	.400	.7500-20	1.026
14	MS27291-3	ZZL-R-5314-A	MS27291-301	ZZL-M-5314	.981	1.170	.460	.8125-20	1.090
16	MS27291-4	ZZL-R-5316-A	MS27291-401	ZZL-M-5316	1.106	1.170	.610	.9375-20	1.250
18	MS27291-5	ZZL-R-5318-A	MS27291-501	ZZL-M-5318	1.231	1.170	.690	1.0625-18	1.358
20	MS27291-14	ZZL-R-5320-A	MS27291-801	ZZL-M-5320	1.356	1.170	.830	1.1875-18	1.496
22	MS27291-6	ZZL-R-5322-A	MS27291-601	ZZL-M-5322	1.481	1.170	.940	1.3125-18	1.604
24	MS27291-15	ZZL-R-5324-A	MS27291-901	ZZL-M-5324	1.606	1.170	1.040	1.4375-18	1.740

Cable Supports - Stainless Steel, Straight



Shell Size	Standard Straight Support (L = .781)						Long Straight Support				
	MS No.	Amphenol/ Pyle No.	A	MS No.	Amphenol/ Pyle No.	A	Similar to MS No.	Amphenol/ Pyle No.	A	L	Thread
10	NA	NA	NA	NA	NA	NA	NA	FPL-R-5310L	NA	NA	.563-36
12	NA	NA	NA	NA	NA	NA	MS27658-12	FPL-R-5312L	.435	1.070	.753-36
14	MS27657-14	ZZL-R-5314	.230	MS27657-1	FPL-R-5314	.382	MS27658-14	FPL-R-5314L	.504	1.170	.803-36
16	MS27657-16	ZZL-R-5316	.292	MS27657-2	FPL-R-5316	.462	MS27658-16	FPL-R-5316L	.686	1.270	.930-36
18	MS27657-18	ZZL-R-5318	.392	MS27657-3	FPL-R-5318	.556	MS27658-18	FPL-R-5318L	.794	1.370	1.036-36
20	NA	NA	NA	NA	NA	NA	NA	FPL-R-5320L	NA	NA	NA
22	MS27657-22	ZZL-R-5322	.516	MS27657-4	FPL-R-5322	.608	MS27658-22	FPL-R-5322L	1.038	1.570	1.286-36
24	NA	NA	NA	NA	NA	NA	MS27658-24	FPL-R-5324L	1.162	1.670	1.411-36
28	NA	NA	NA	NA	NA	NA	MS27658-28	FPL-R-5328L	1.412	1.870	1.661-36

Cable Supports - Stainless Steel, Right Angle



Shell Size	Cable Support, Right Angle				
	Similar to MS No.	Amphenol/Pyle No.	A	L	Thread
10	NA	FPL-R-5210	NA	NA	.563-36
12	MS27659-12	FPL-R-5212	.435	1.298	.753-36
14	MS27659-14	FPL-R-5214	.504	1.388	.803-36
16	MS27659-16	FPL-R-5216	.686	1.523	.930-36
18	MS27659-18	FPL-R-5218	.794	1.622	1.036-36
22	MS27659-22	FPL-R-5222	1.038	1.878	1.286-36
24	MS27659-24	FPL-R-5224	1.162	2.000	1.411-36
28	MS27659-28	FPL-R-5228	1.412	2.250	1.661-36

Accessories - cable supports, cont. for MIL-C-26500 cylindrical connectors

Additional right angle conduit adapters and cable support clamps are available which provide added protection for the cable or wiring. Closed back cable support clamps have a removable cover; while open back cable support clamps have a strap to protect the wires at the right angle bend.

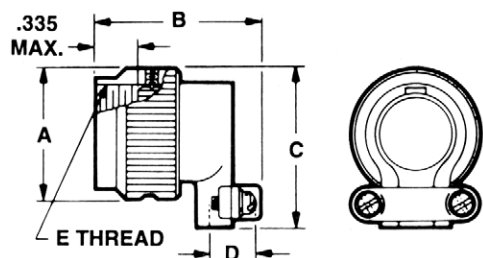


Cable Supports - Stainless Steel, Closed Right Angle



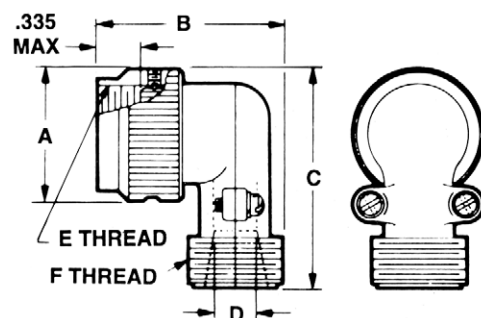
Shell Size	Cable Support - Closed Right Angle						
	MS No.	Amphenol No.	A Dia. Max.	B Max.	C Max	D Max	E Thread UNEF-2B
8	MS27558-1	48-2222-08100	.672	1.200	.938	.245	.4375-28
10	MS27558-2	48-2222-10100	.797	1.320	1.049	.370	.5625-24
12	MS27558-3	48-2222-12100	1.016	1.320	1.248	.370	.7500-20
14	MS27558-4	48-2222-14100	1.110	1.487	1.330	.520	.8125-20
16	MS27558-5	48-2222-16100	1.234	1.470	1.447	.520	.9375-20
18	MS27558-6	48-2222-18100	1.360	1.588	1.577	.645	1.0625-18
20	MS27558-7	48-2222-20100	1.485	1.759	1.698	.780	1.1875-18
22	MS27558-8	48-2222-22100	1.610	1.759	1.820	.780	1.3125-18
24	MS27558-9	48-2222-24100	1.735	2.027	1.945	1.065	1.4375-18

Cable Supports - Stainless Steel, Open Right Angle



Shell Size	Cable Support - Open Right Angle						
	MS No.	Amphenol No.	A Dia. Max.	B Max.	C Max	D Max	E Thread UNEF-2B
8	MS27559-1	48-2222-08200	.672	1.173	.938	.201	.4375-28
10	MS27559-2	48-2222-10200	.797	1.293	1.049	.328	.5625-24
12	MS27559-3	48-2222-12200	1.016	1.293	1.248	.328	.7500-20
14	MS27559-4	48-2222-14200	1.110	1.460	1.330	.452	.8125-20
16	MS27559-5	48-2222-16200	1.234	1.443	1.447	.508	.9375-20
18	MS27559-6	48-2222-18200	1.360	1.561	1.577	.571	1.0625-18
20	MS27559-7	48-2222-20200	1.485	1.732	1.698	.748	1.1875-18
22	MS27559-8	48-2222-22200	1.610	1.732	1.819	.748	1.3125-18
24	MS27559-9	48-2222-24200	1.735	2.000	1.945	.996	1.4375-18

Conduit Adapter- Stainless Steel, Right Angle

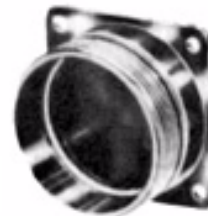


Shell Size	Conduit Adapter - Right Angle							
	Equivalent MS No.	Amphenol No.	A Dia. Max.	B Max.	C Max	D Max	E Thread UNEF-2B	F Thread UNEF-2A
8	MS27557-1	48-2222-08000	.672	1.300	1.403	.245	.4375-28	.6250-24
10	MS27557-2	48-2222-10000	.797	1.420	1.514	.370	.5625-24	.7500-20
12	MS27557-3	48-2222-12000	1.016	1.420	1.713	.370	.7500-20	.7500-20
14	MS27557-4	48-2222-14000	1.110	1.575	1.795	.520	.8125-20	.8750-20
16	MS27557-5	48-2222-16000	1.234	1.558	1.912	.520	.9375-20	.8750-20
18	MS27557-6	48-2222-18000	1.360	1.675	2.042	.645	1.0625-18	1.0000-20
20	MS27557-7	48-2222-20000	1.485	1.863	2.163	.780	1.1875-18	1.1875-18
22	MS27557-8	48-2222-22000	1.610	1.863	2.285	.780	1.3125-18	1.1875-18
24	MS27557-9	48-2222-24000	1.735	2.118	2.410	1.065	1.4375-18	1.4375-18

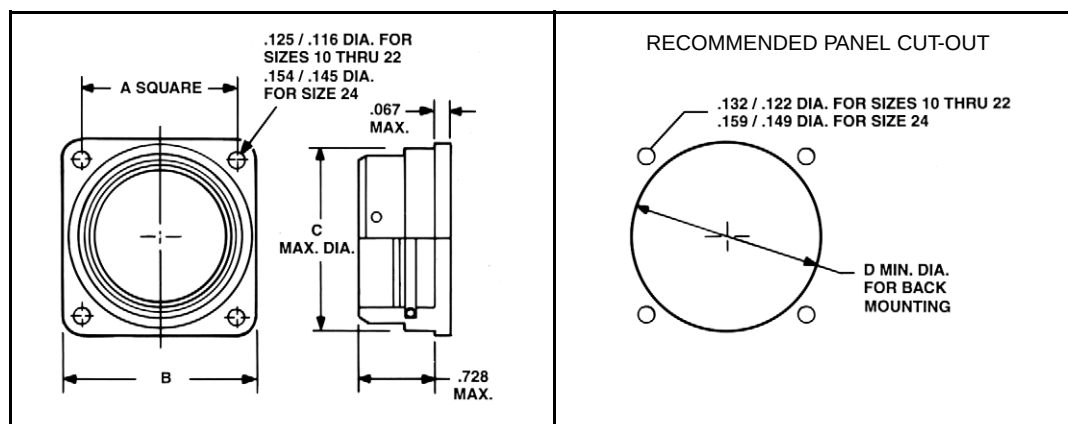
Accessories - dummy receptacles for MIL-C-26500 cylindrical connectors

Dummy Receptacles - Aluminum - Threaded or Bayonet

Used as an anchoring place for disconnected plugs, dummy receptacles eliminate the problems involved in letting plugs swing freely. They also provide a limited air seal and prevent accumulation of foreign material on the face of the plug. Order by part numbers in chart below.



Threaded Style
pictured



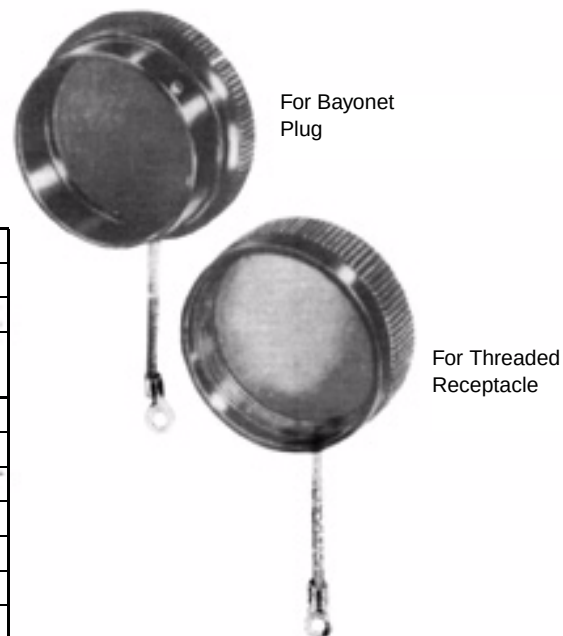
Size	Dimensional Data					How to Order			
	Thread Size UNEF-2A	A Square ±.005	B ±.005	C Max. Dia.	D Min. Dia.	Bayonet		Threaded	
						Amphenol Part No.	Equivalent MS Part No.	Amphenol Part No.	Equivalent MS Part No.
10	.6875-24	.719	.937	.696	.748	48-149-10000	MS27297-1	48-172-10000	MS27296-1
12	.8750-20	.812	1.031	.875	.913	48-149-12000	MS27297-2	48-172-12000	MS27296-2
14	.9375-20	.906	1.125	.935	.980	48-149-14000	MS27297-3	48-172-14000	MS27296-3
16	1.0625-18	.969	1.250	1.062	1.107	48-149-16000	MS27297-4	48-172-16008	MS27296-4
18	1.1875-18	1.062	1.343	1.187	1.209	48-149-18000	MS27297-5	48-172-18000	MS27296-5
20	1.3125-18	1.156	1.437	1.312	1.337	48-149-20000	MS27297-8	48-172-20000	MS27296-8
22	1.4375-18	1.250	1.562	1.437	1.452	48-149-22000	MS27297-6	48-172-22000	MS27296-6
24	1.5625-18	1.375	1.703	1.562	1.577	48-149-24000	MS27297-9	48-172-24000	MS27296-9

Accessories - protection caps for MIL-C-26500 cylindrical connectors

Protection Caps and Chains - Threaded or Bayonet

Protective metal caps provide an environmental seal for the connector face. They exclude dirt, dust, moisture and other foreign materials from the face of unmated plugs and receptacles. The caps have a woven steel strap so they can be easily attached near their point of use.

Dimensional Data						
Size	A Max. Dia.	B $\pm$.250 Chain Length	Bayonet Cap		Threaded Cap	
			Plug	Receptacle	Plug	Receptacle
			C $\begin{smallmatrix} +.000 \\ -.005 \end{smallmatrix}$	C' $\begin{smallmatrix} +.005 \\ -.000 \end{smallmatrix}$	C Thread UNEF-2A	C' Thread UNEF-2B
10	.906	3.00	.659	.662	.6875-24	.6875-24
12	1.078	3.00	.829	.832	.8750-20	.8750-20
14	1.141	5.00	.898	.901	.9375-20	.9375-20
16	1.266	5.00	1.025	1.028	1.0625-18	1.0625-18
18	1.375	5.00	1.131	1.134	1.1875-18	1.1875-18
20	1.510	5.00	1.256	1.263	1.3125-18	1.3125-18
22	1.625	5.00	1.381	1.384	1.4375-18	1.4375-18
24	1.760	5.00	1.506	1.511	1.5625-18	1.5625-18



How to Order Bayonet Cap & Chain				
Size	Plug		Receptacle	
	Amphenol Part No.	Equivalent MS Part No.	Amphenol Part No.	Equivalent MS Part No.
10	48-2144	MS27293-1	48-2150	MS27295-1
12	48-2143	MS27293-2	48-2149	MS27295-2
14	48-2142	MS27293-3	48-2148	MS27295-3
16	48-2141	MS27293-4	48-2147	MS27295-4
18	48-2140	MS27293-5	48-2146	MS27295-5
20	48-2773	MS27293-8	48-2774	MS27295-8
22	48-2139	MS27293-6	48-2145	MS27295-6
24	48-2767	MS27293-9	48-2768	MS27295-9

How to Order Threaded Cap & Chain				
Size	Plug		Receptacle	
	Amphenol Part No.	Equivalent MS Part No.	Amphenol Part No.	Equivalent MS Part No.
10	48-2340-10	MS27292-1	48-2301-10	MS27294-1
12	48-2340-12	MS27292-2	48-2301-12	MS27294-2
14	48-2340-14	MS27292-3	48-2301-14	MS27294-3
16	48-2340-16	MS27292-4	48-2301-16	MS27294-4
18	48-2340-18	MS27292-5	48-2301-18	MS27294-5
20	48-2340-20	MS27292-8	48-2301-20	MS27294-8
22	48-2340-22	MS27292-6	48-2301-22	MS27294-6
24	48-2340-24	MS27292-9	48-2301-24	MS27294-9