48
series

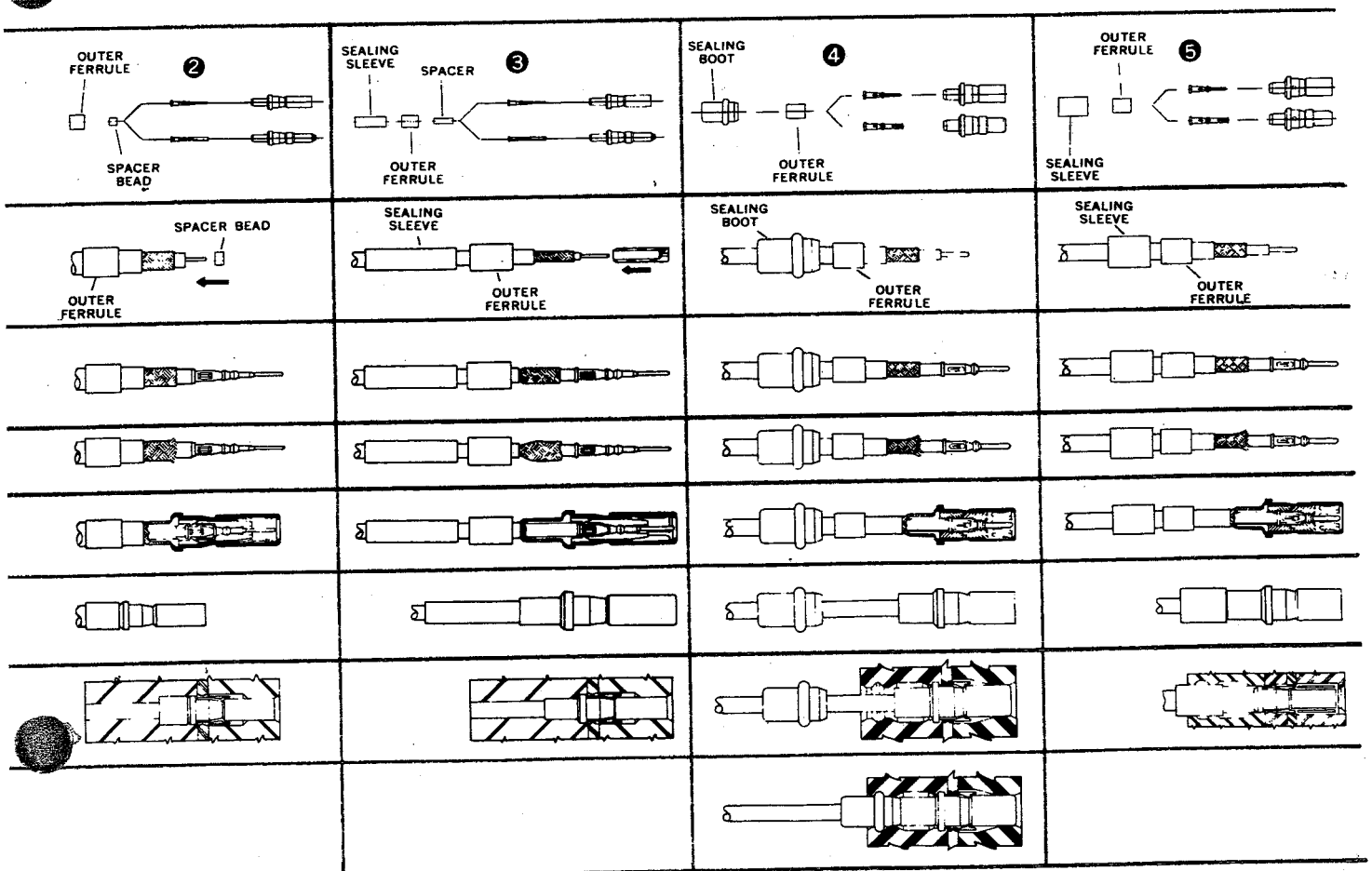
Amphenol® miniature circular connectors

qualified to MIL-C-26500

shielded contact crimping

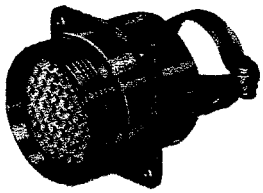
Drawing	Shielded Contact	Contact Pin (P) or Sockets	Cable Stripping Dimensions +1/64, -.000 inch			Crimp Tools Center Contact (Amphenol Nos.)			Outer Ferrule Crimping ▲Tool	Cable Application
			A	B	C	Tool	Nest Bushing	Crimp Setting		
1 #1 Shielded	48-1226-02 48-1227-02, 48-1227-50	P S S	7/32	5/64	7/64	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 48-1227-57	P S	7/32	5/64	7/64	294-268* 294-289**	294-1631	#1	294-528	Raychem 9530A11
2 #1 Shielded	48-1226-51, -54 48-1227-51, -54, -56	P S	7/32	1/32	5/32	294-268* 294-289**	294-1631	#1	294-528	RG-180/U, -180A/U, -180B/U, -195/U
3 #1 Shielded	48-1226-55 48-1227-55	P S	15/64	1/32	5/32	294-268* 294-289**	294-1631	#1	294-529	RG-178/U, -178A/U, -178B/U, -196-U
4 #2 Shielded	48-2187-02 48-2188-02	P S	7/32	7/64	9/64	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 48-2188-50, -51, -53, -54	P S	7/32	7/64	9/64	†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
5 #2 Shielded	48-2187-52 48-2188-52	P S	5/16	7/64	9/64	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 † Same as 294-126, less positioners ▲Including Hex Die Set
**MS3191 tools are inactive for new procurement, but can be used if available.



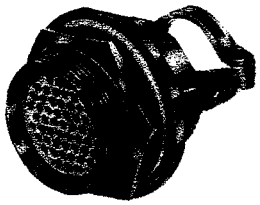
Threaded
Plug

48-06RXX-XXX
MS24266RXXTXXX



Threaded
Square Flange Receptacle

48-00RXX-XXX
MS24264RXXTXXX

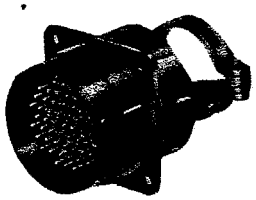


Threaded
Single Hole
Mounting Receptacle

48-03RXX-XXX
MS24265RXXTXXX

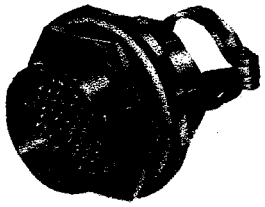
Bayonet
Plug

48-16RXX-XXX
MS24266RXXBXXX



Bayonet
Square Flange Receptacle

48-10RXX-XXX
MS24264RXXBXXX



Bayonet
Single Hole
Mounting Receptacle

48-13RXX-XXX
MS24265RXXBXXX

NOTE: Connector shown with optional cable clamp

Amphenol 48 series miniature circular connectors are used in a wide range of electrical and electronic equipment for aviation, missile, instrumentation and industrial applications.

Design features include:
Poke-Home® Contacts - (rear insertable, front release) provides easy servicing of connector circuits without disassembling connector

Monoblock construction - eliminates air voids and protects connectors from degrading moisture and altitude conditions

Resilient silicone rubber dielectric -for unsurpassed resistance to tear, compression set, fluids and high temperatures.

Crimp contacts - quick, reliable termination, contact sizes 20, 16, 12 and shielded with gold over nickel plating (other platings available, contact nearest sales office for details).

Features

- full performance in extreme environments
- operate continuously at 200°C (392°F)
- withstand thermal shock cycling from -55°C (-67°F) to 260°C (500°F)
- support 1500 V RMS from sea level to 340,000 ft., mated
- maintain environmental and electrical integrity during and after 0 to 2,000 CPS vibration during exposure to 200°C (392°F) and -55°C (-67°F)
- withstand physical shock of 100 gravity units
- resist corrosion, ozone, sand and dust

Table of Contents

Design specifications subject to change. Consult your nearest Amphenol North America sales office for the latest specifications.

performance characteristics

High Voltage - No flashover or breakdown occurs after 1-min. application of voltage as follows: 1250 volts RMS at 10,000 ft. altitude and 1000 volts RMS at each altitude increase of 20,000 ft. from 30,000 ft. to 110,000 ft. (Per MIL-STD-202, Method 301.)

High Voltage (Unmated) - No flashover or breakdown occurs after 1-min. application of voltage as follows: 1500 volts RMS at sea level, 1250 volts RMS at 10,000 ft. altitude, and progressively reduced from 1250 volts RMS at 10,000 ft. to 200 volts at 110,000 ft. as altitude is increased in 20,000-ft. steps. (Per MIL-STD-202, Method 301.)

Insulation Resistance - Insulation resistance exceeds minimum of 5000 megohms at room temperature, as measured between closest pair of contacts and between shell and closest contact per MIL-STD-202, Method 302, Condition B; insulation resistance exceeds minimum of 2000 megohms at 200°C ambient.

Temperature Life - Connectors withstand 1000-hr. exposure to 200°C ambient temperature, carrying sufficient current to maintain contact temperature of 238°C.

Thermal Shock - No evidence of damage after 5 cycles from -65°C to +260°C, held at each temperature for 30 min. and transferred from one temperature to the other in 2 min. or less.

Physical Shock - No physical damage result when connectors are fully wired, with leads at least 8 in. long, and subjected to 100 G's along each axis.

Vibration - No discontinuity greater than one microsecond occurs during or following this test. Contacts are wired in series, carrying 100 ma current, and are subjected to a program of vibrations of 0.06 in. double amplitude or 20 G's acceleration from 10 to 2000 cps for 4 hrs. in each of 3 major axes per MIL-STD-202, Method 204, Condition D. Connectors are tested at -65°C and +200°C ambient.

Air Leakage - With 30 psi pressure differential across Class R receptacle, leakage at -55°C does not exceed 1 cubic in./hr. Leakage for Class H hermetic receptacle does not exceed 0.01 micron cubic ft./hr. at 15 psi pressure differential.

Moisture Resistance - Connectors maintain minimum insulation resistance of 1000 megohms after 10 continuous cycles (10 days) of high humidity as per MIL-STD-202, Method 106 (omitting step 7b).

Altitude Immersion - Connectors maintain minimum of 5000 megohms insulation resistance and no flashover or breakdown with 1500 volts rms applied while immersed in salt water after 3 pressure cycles. Pressure is reduced to 1 in. Hg. (75,000 ft. altitude) for 30 min. and returned to atmospheric pressure.

Corrosion - No corrosion or base metal is exposed after 48-hr. exposure to salt spray, per MIL-STD-202, Method 101, Condition B. Connectors are checked at room temperature after rinsing with tap water and oven drying.

Fluid Immersion - After 20-hour immersion of unmated connectors in MIL-H-5606 hydraulic fluid or in MIL-L-9236 lubrication oil, 1 hour free-air exposure, and mating by hand, connectors perform satisfactorily.

Ozone Exposure - No deterioration occurs to unmated connector after 2-hr. exposure to room temperature air with ozone concentration of .010/.015% by volume.

Maintenance Aging - There is no damage to contacts or connectors after 10 removals and insertions of the contacts.

Contact Retention - Contact locking mechanism withstands the following minimum axial forces:

CONTACT SIZE	20	16	12
FORCE (LBS.)	20	25	30

Axial displacement does not exceed .012 in. when pressure is applied from face side.

Contact Insertion and Removal Force - Under 8 lb. maximum, except for last 10% of the contacts installed which do not exceed 15-lb. maximum. Individual removal forces do not exceed 10-lb. maximum.

Coupling Durability - Connectors are coupled and uncoupled 200 times for type T and 500 times for type B without deterioration.

Coupling Forces - Torques or axial forces required to couple and uncouple mating plugs and receptacles remain consistently less than the following maximum values:

SHELL SIZE	8	10	12	14	16	18	20	22	24
TORQUE (IN. LB.)	8	10	14	17	23	26	31	38	46

Insert Retention - No insert dislocation occurs when plugs and receptacles are subjected to axial loads of 75 lbs. in either direction for 5 secs. For hermetics, 5000 psi for 5 secs per MIL-C-38300.

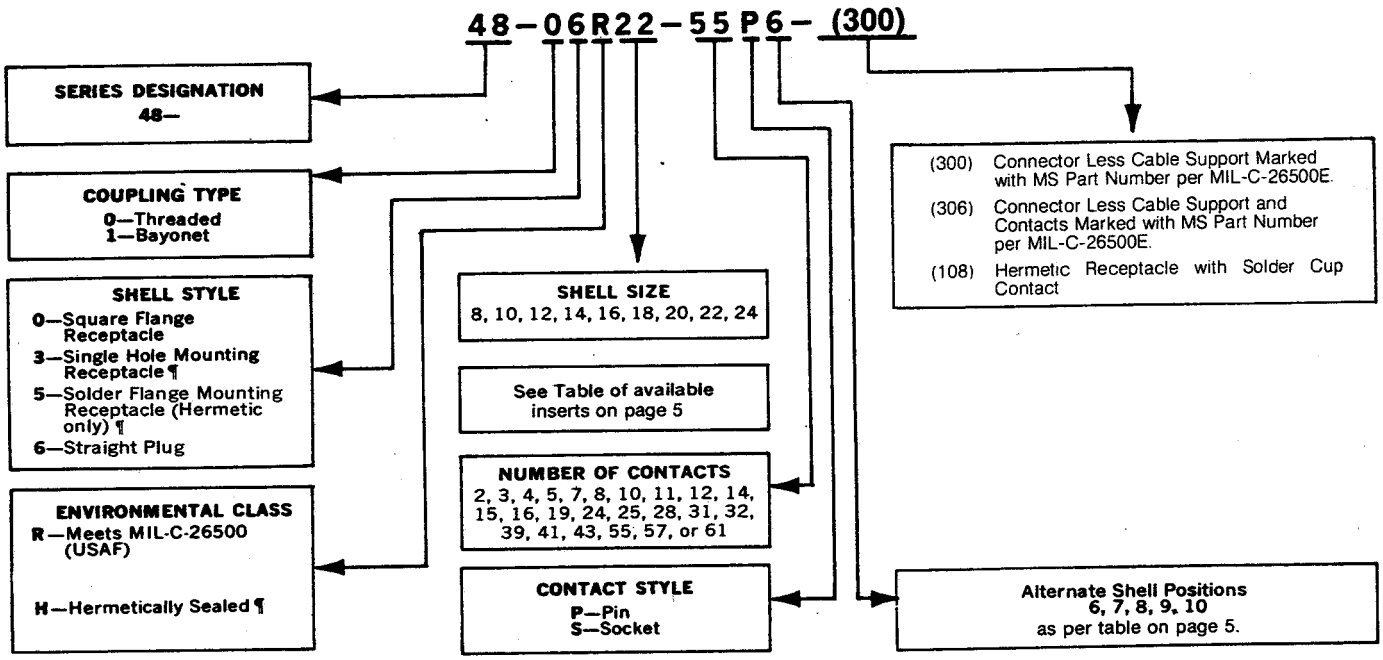
Magnetic Permeability - Permeability of assembled Class R connectors is less than 2.0 mu.

Contact Resistance - Class R contacts meet MIL-C-26636 requirements at 25°C and 200°C. Class H contacts mated with Class R plug did not exceed Class R contact resistance by average of 700%.

part number information

48 series

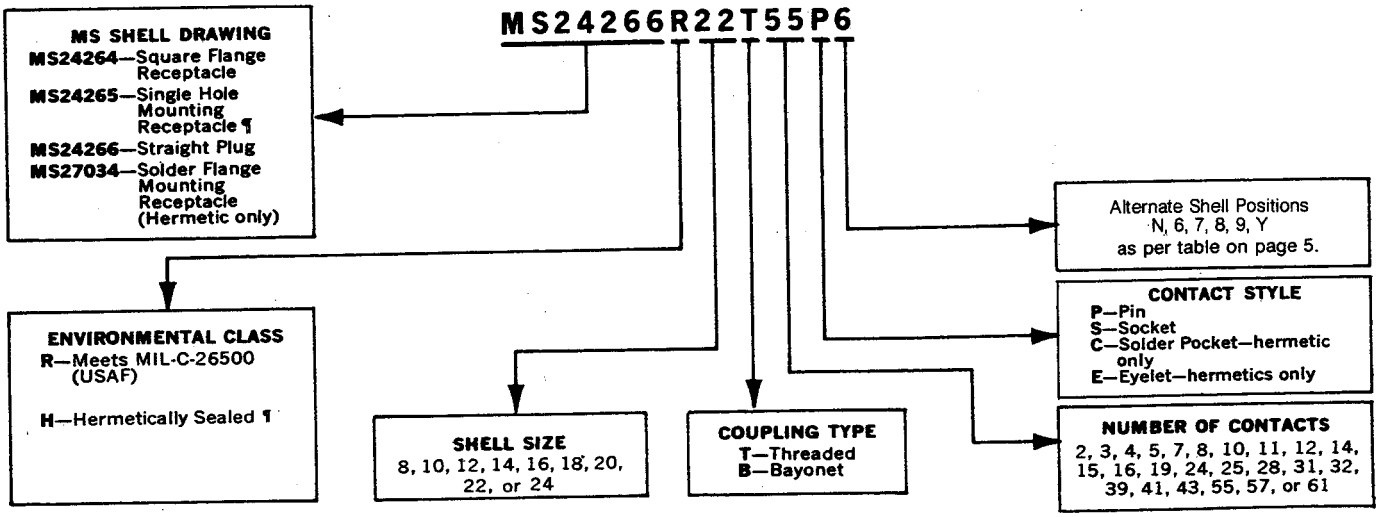
To get the specific 48 Series connector you want, put together the part number as per the following typical example. (Only the inserts shown on page 5 are available.)



¶Hermetics are available in receptacle shell style "X3" (MS24265) and "X5" (MS27034).

military standard

You can use MS as well as Amphenol North America Division part numbers in ordering 48 Series connectors. The MS part numbers for MIL-C-26500 E Revision connectors are worked out on the basis shown in the table below.



¶Hermetics are available in receptacle shell style (MS24265) and (MS27034).

Part numbers, both Amphenol and Military Standard, for the contacts and assembly tools are listed on page 13.

Inserts Available (showing front face of socket insert)

Shell Size—8 MS-27561

2 #20 contacts
Insert 8-2

3 #20 contacts
Insert 8-3

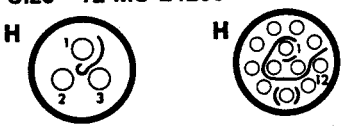
Shell Size—10 MS-24260

2 #20 contacts
Insert 10-2

2 #16 contacts
Insert 10-20

5 #20 contacts
Insert 10-5

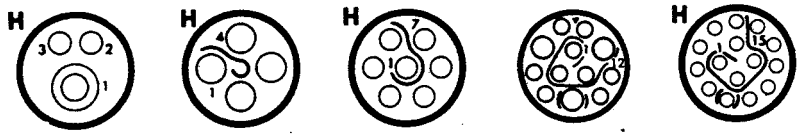
Shell Size—12 MS-24260



3 #16 contacts
Insert 12-3

12 #20 contacts
Insert 12-12

Shell Size—14 MS-24260



2 #16 contacts
1 #2 shielded contact
Insert 14-3

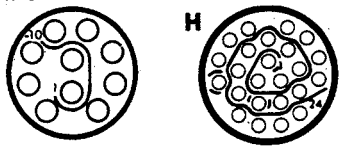
4 #12 contacts
Insert 14-4†

7 #16 contacts
Insert 14-7

9 #20 contacts
3 #16 contacts
Insert 14-12

15 #20 contacts
Insert 14-15

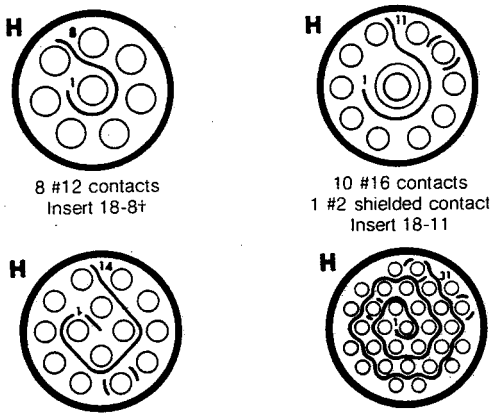
Shell Size—16 MS-24261



10 #16 contacts
Insert 16-10

24 #20 contacts
Insert 16-24

Shell Size—18 MS-24262



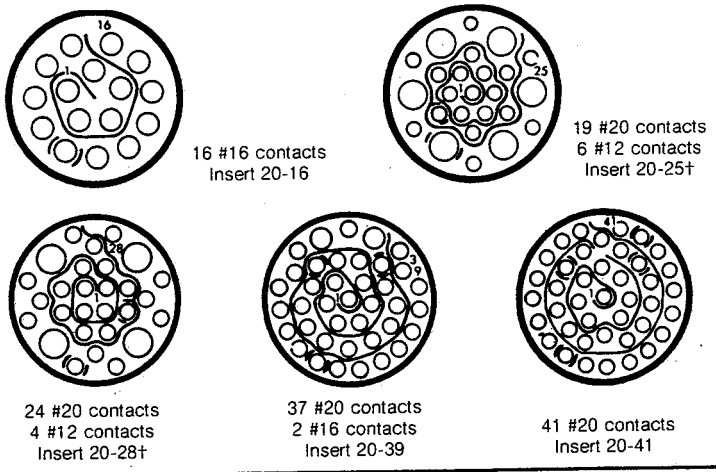
8 #12 contacts
Insert 18-8†

10 #16 contacts
1 #2 shielded contact
Insert 18-11

14 #16 contacts
Insert 18-14

31 #20 contacts
Insert 18-31

Shell Size—20 MS-27561



16 #16 contacts
Insert 20-16

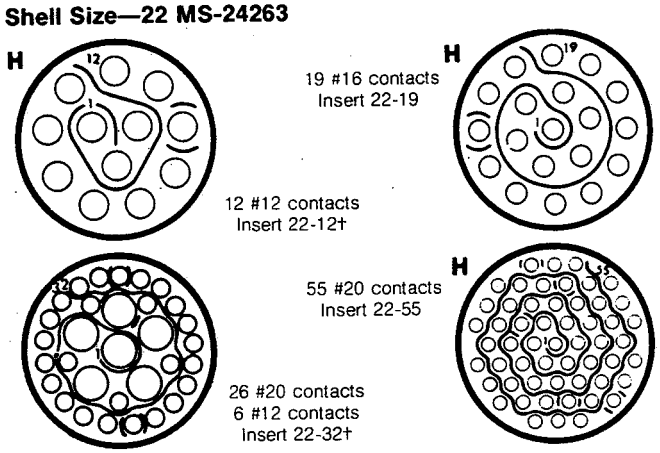
19 #20 contacts
6 #12 contacts
Insert 20-25†

24 #20 contacts
4 #12 contacts
Insert 20-28†

37 #20 contacts
2 #16 contacts
Insert 20-39

41 #20 contacts
Insert 20-41

Shell Size—22 MS-24263



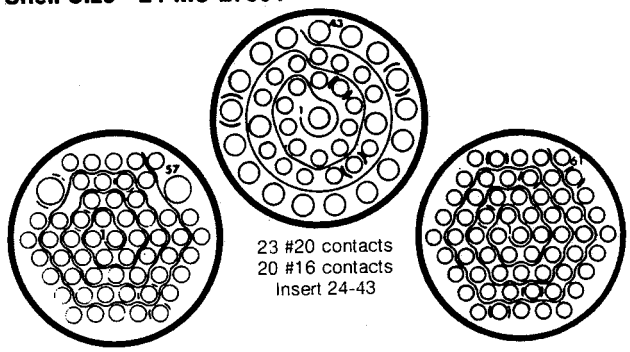
19 #16 contacts
Insert 22-19

12 #12 contacts
Insert 22-12†

55 #20 contacts
Insert 22-55

26 #20 contacts
6 #12 contacts
Insert 22-32†

Shell Size—24 MS-27561



2 #12 contacts
55 #20 contacts
Insert 24-57†

23 #20 contacts
20 #16 contacts
Insert 24-43

61 #20 contacts
Insert 24-61

†#1 shielded contact is interchangeable with #12 power contact

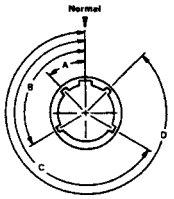
Only inserts marked H are currently available in hermetics. Consult factory on others.

alternate shell positions

For connectors Size 8 and 10					Size 12, 14, 16, 18, 20, 22, and 24			
Position	**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*	25°	115°	220°	270°	98°	152°	268°	338°

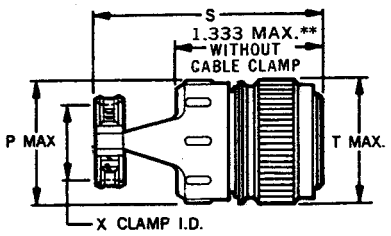
Alternate shell position
Front face of receptacle shown

Note: Alternate position Y incorporates special shell polarizing key and keyways. All inserts remain in the normal position.

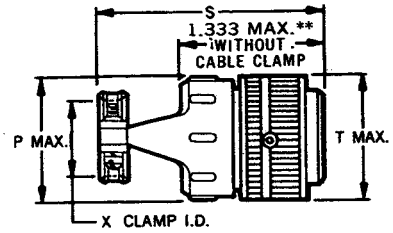


*Position Y not available in size 8 connector.

plugs



THREADED PLUG
48-06RXX-XXX
MS24266RXXT-XXX



BAYONET PLUG
48-16RXX-XXX
MS24266RXXB-XXX

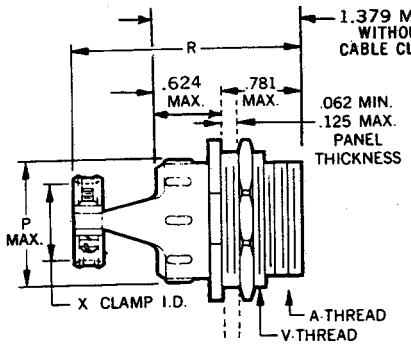
dimensions

Shell Size	P. Max.		Thread T Max. Bayonet				X		S Max.	
	Inch	MM	Inch	MM	Inch	MM	Inch ±.015	MM ±.33	Inch	MM
8	.582	14.78	.708	17.98	.766	19.46	.180	4.57	1.832	46.53
10	.731	18.57	.836	21.23	.906	23.01	.270	6.86	1.832	46.53
12	.919	23.34	1.025	26.04	1.078	27.38	.400	10.16	1.832	46.53
14	.981	24.92	1.125	28.58	1.141	28.98	.460	11.68	2.067	52.50
16	1.106	28.09	1.250	31.75	1.266	32.16	.610	15.49	2.067	52.50
18	1.231	31.27	1.375	34.93	1.375	34.93	.690	17.53	2.067	52.50
20	1.356	34.44	1.510	38.35	1.510	38.35	.830	21.08	2.067	52.50
22	1.481	37.62	1.625	41.28	1.625	41.28	.940	23.88	2.067	52.50
24	1.606	40.79	1.760	44.70	1.760	44.70	1.040	26.42	2.067	52.50

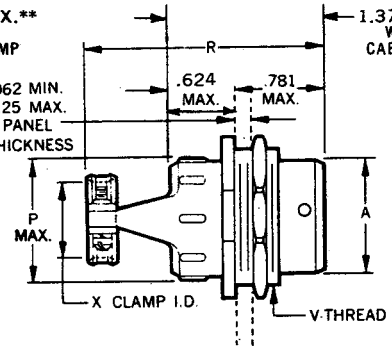
metric equivalent chart

Inch	MM	Inch	MM	Inch	MM	Inch	MM	Inch	MM
.062	1.57	.132	3.35	.620	15.75	1.333	33.86	2.357	34.47
.067	1.70	.145	3.68	.624	15.85	1.607	40.82	3.683	93.55
.116	2.95	.149	3.78	.728	18.49	1.621	41.17		
.122	3.10	.152	3.86	.750	19.05	2.211	56.16		
.125	3.18	.159	4.04	.781	19.84	2.343	59.51		

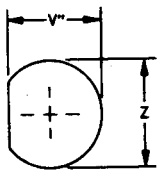
receptacles
single hole mounting



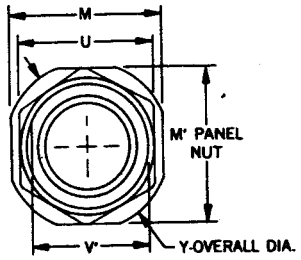
THREADED RECEPTACLE
48-OORXX-XXX
MS24264RXXT-XXX



BAYONET RECEPTACLE
48-10RXX-XXX
MS24264RXXB-XXX



PANEL CUT-OUT



FLANGE AND NUT

BOTH THREADED AND BAYONET RECEPTACLES

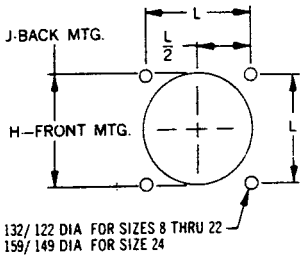
Shell Size	A Thread —	A +.000 -.005 Inch	A +.000 -.13 MM	M Max. Inch	M Max. MM	M' Max. Inch	M' Max. MM	P Max.* Inch	P Max.* MM	U Max. Inch	U Max. MM	V Thd	V' Inch ±.003	V' MM ±.077	V" Inch ±.005	V" MM ±.13	X Inch ±.015	X MM ±.38	Y Max. Inch	Y Max. MM	Z Inch ±.005	Z MM ±.13	R Max. Inch	R Max. MM
8	9/16-24	.536	13.61	.984	24.99	.938	23.83	.582	14.78	.828	21.03	5/8-20	.593	15.06	.605	15.37	.180	4.57	1.068	27.13	.635	16.13	1.890	48.01
10	11/16-24	.659	16.74	1.109	28.17	1.082	27.48	.731	18.57	.953	24.21	3/4-20	.718	18.24	.730	18.54	.270	6.86	1.192	30.28	.760	19.30	1.890	48.01
12	7/8-20	.829	21.06	1.296	32.92	1.299	32.99	.919	23.34	1.140	28.96	15/16-20	.905	22.99	.917	23.29	.400	10.16	1.380	35.05	.947	24.05	1.890	48.01
14	15/16-20	.898	22.81	1.396	35.46	1.371	34.82	.981	24.92	1.250	31.75	1-20	.968	24.59	.980	24.89	.460	11.68	1.505	38.23	1.010	25.65	2.125	53.98
16	1 1/16-18	1.025	26.04	1.521	38.63	1.515	38.48	1.106	28.09	1.329	33.76	1 1/8-20	1.093	27.76	1.105	28.07	.610	15.49	1.630	41.40	1.135	28.83	2.125	53.98
18	1 3/16-18	1.131	28.73	1.646	41.81	1.660	42.16	1.231	31.27	1.455	36.96	1 1/4-20	1.217	30.91	1.225	31.12	.690	17.53	1.740	44.20	1.260	32.00	2.125	53.98
20	1 5/16-18	1.256	31.90	1.771	44.98	1.770	44.96	1.356	34.44	1.642	41.71	1 3/8-18	1.342	34.09	1.350	34.29	.830	21.08	1.860	47.24	1.385	35.18	2.125	53.98
22	1 7/16-18	1.381	35.08	1.959	49.76	1.948	49.48	1.481	31.62	1.750	43.31	1 1/2-20	1.467	37.26	1.475	37.47	.940	23.88	2.040	51.82	1.510	38.35	2.125	53.98
24	1 9/16-18	1.506	38.25	2.084	52.93	2.084	52.93	1.606	40.79	1.892	48.06	1 5/8-18	1.591	40.44	1.600	40.64	1.040	26.42	2.160	54.86	1.635	41.53	2.125	53.98

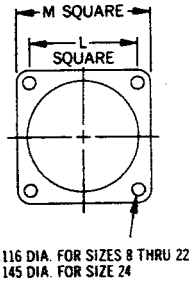
RECOMMENDED MINIMUM TORQUE FOR JAM NUT

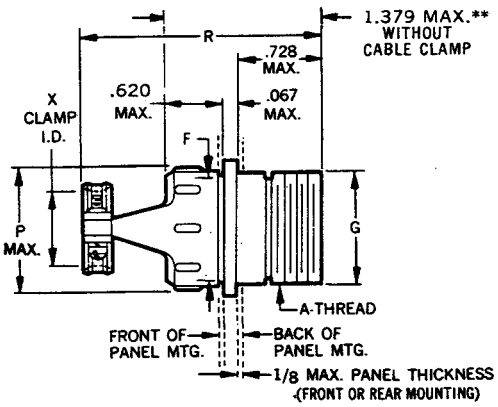
Shell Size	8	10	12	14	16	18	20	22	24
Torque (Inch/lbs.)	33	36	60	65	73	82	106	123	133

receptacles square flange

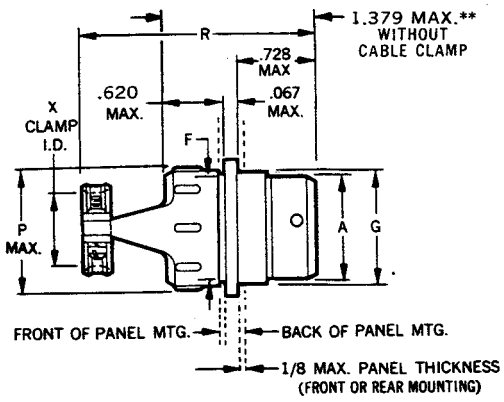
PANEL CUT-OUT DIMENSIONS FOR BOTH THREADED AND BAYONET RECEPTACLES







THREADED RECEPTACLE
48-00RXX-XXX
MS24264RXXT-XXX

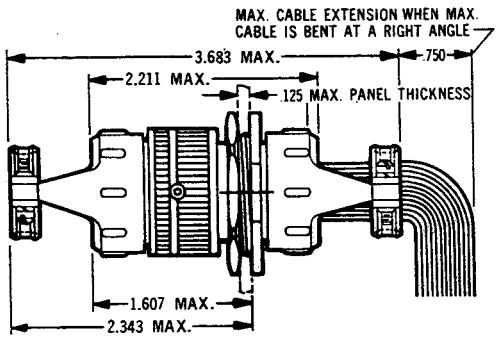


BAYONET RECEPTACLE
48-10RXX-XXX
MS24264RXXB-XXX

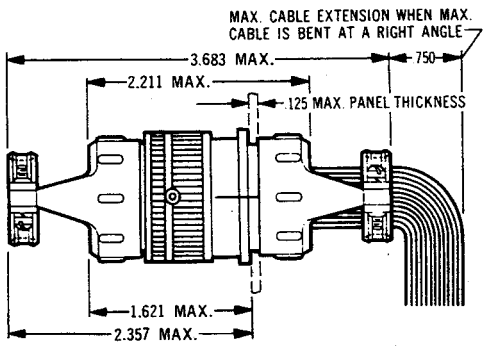
dimensions

Shell Size	A thread	A		F Max.		G Max.		H Min.		J Min.		L		M		P Max.		X		R Max.	
		+.000 Inch -.005	+.000 MM -.13	Inch	MM	Inch	MM	Inch	MM	Inch	MM	Inch ±.005	MM ±.13	Inch ±.005	MM ±.13	Inch	MM	Inch ±.015	MM ±.35	Inch	MM
8	9/16-24	.536	13.61	.437	11.10	.561	14.25	.447	11.35	.620	15.75	.594	15.09	.812	20.62	.582	14.78	.180	4.57	1.890	48.01
10	11/16-24	.659	16.74	.562	14.27	.696	17.68	.572	14.53	.748	19.00	.719	18.26	.937	23.80	.731	18.57	.270	6.86	1.890	48.01
12	7/8-20	.829	21.06	.750	19.05	22.23	22.23	.760	19.30	.913	23.19	.812	20.62	1.031	26.19	.919	23.34	.400	10.16	1.890	48.01
14	15/16-20	.898	22.81	.812	20.62	.935	23.75	.822	20.88	.980	24.89	.906	23.01	1.125	28.58	.981	24.92	.460	11.68	2.125	53.98
16	1 1/16-18	1.025	26.04	.938	23.83	1.062	26.97	.948	24.08	1.107	28.12	.969	24.61	1.250	31.75	1.106	28.09	.610	15.49	2.125	53.98
18	1 3/16-18	1.131	28.73	1.062	26.97	1.187	30.15	1.072	27.23	1.209	30.71	1.062	26.97	1.343	34.11	1.231	31.27	.690	17.53	2.125	53.98
20	1 5/16-18	1.256	31.90	1.182	30.02	1.312	33.32	1.192	30.28	1.337	33.96	1.156	29.36	1.437	36.50	1.356	34.44	.830	21.08	2.125	53.98
22	1 7/16-18	1.381	35.08	1.312	33.32	1.437	36.50	1.322	33.58	1.452	36.88	1.250	31.75	1.562	39.67	1.481	37.62	.940	23.88	2.125	53.98
24	1 9/16-18	1.506	38.25	1.432	36.37	1.562	39.67	1.442	36.63	1.577	40.06	1.375	34.93	1.703	43.26	1.606	40.79	1.606	26.42	2.125	53.98

mated pair dimensions threaded or bayonet coupling

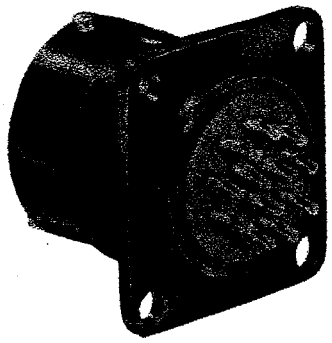


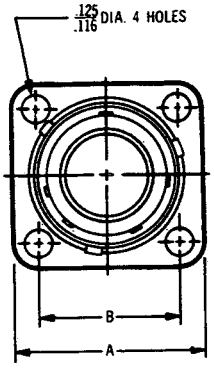
SINGLE HOLE MOUNTING RECEPTACLE AND STRAIGHT PLUG

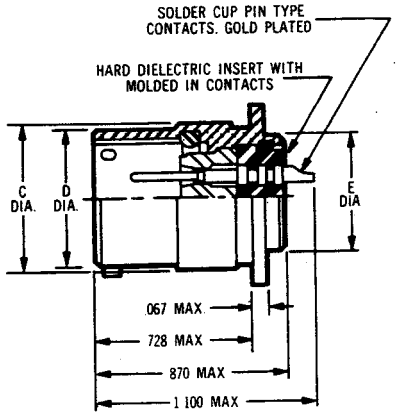


SQUARE FLANGE RECEPTACLE AND STRAIGHT PLUG

receptacle short skirt







Shorter, lighter, and more economical—that's how the short skirt receptacles compare with the standard receptacles in the 48 Series. 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 48 Series connectors. The short skirt receptacles come in two versions: with standard flange and with reduced flange. Both versions are 1.100" (27.94) long, or .275" (6.99) shorter than the standard. They have bayonet coupling and mate with standard 48 Series plugs. The hard dielectric inserts, with resilient face seal and molded-in, gold plated solder cup pin contacts, are available in the arrangements shown.

dimensions with reduced flange

Insert Arrangement	A Max.		B		C Max.		D		E Max.	
	Inch	MM	Inch ±-.005	MM ±.13	Inch	MM	+.00 Inch -.005	+.00 MM -.13	Inch	MM
10-5	.870	22.10	.647	16.43	.696	17.68	.659	16.74	.562	14.27
12-3 and 12-12	.996	25.30	.773	19.63	.875	22.23	.829	21.06	.750	19.05

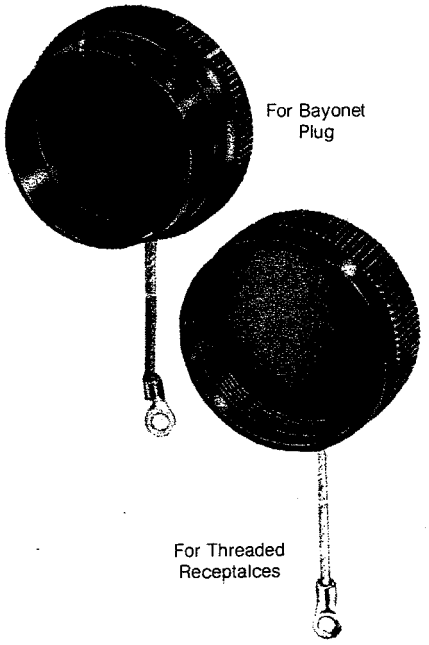
AMPHENOL Part No.	Insert Arrangement
Available with pin contacts only	
STANDARD FLANGE	
48-7115-xx	10-5
48-7116-xx	12-3
48-7117-xx	12-12
48-7118-xx	14-4
48-7119-xx	14-7
48-7120-xx	14-15
48-7121-xx	16-24
48-7122-xx	18-8
48-7123-xx	18-14

AMPHENOL Part No.	Insert Arrangement
48-7124-xx	18-31
48-7251-xx	20-25
48-7175-xx	20-28
48-7125-xx	22-12
48-7126-xx	22-19
48-7127-xx	22-55
REDUCED FLANGE	
48-7132-xx	10-5
48-7133-xx	12-3
48-7134-xx	12-12

-xx Alternate keying position—omit for normal position

accessories
caps and chains

Size	A Max. Dia.		B Chain Length		C Bayonet Cap and Chain				C-Coupling Thread Threaded Cap and Chain	
	Inch	MM	Inch ±.250	MM ±6.35	Plug Cap + .000 Inch -.005	+ .00 MM -.13	Receptacle Cap + .005 Inch -.000	+ .13 MM -.00	Plug UNEF-2A	Receptacle UNEF-2B
10	.906	23.01	3.00	76.20	.659	16.74	.662	16.81	$^{11}/_{16}$-24	$^{11}/_{16}$-24
12	1.078	27.38	3.00	76.20	.829	21.06	.832	21.13	$^{7}/_{8}$-20	$^{7}/_{8}$-20
14	1.141	28.98	5.00	127.00	.898	22.81	.901	22.89	$^{15}/_{16}$-20	$^{15}/_{16}$-20
16	1.266	32.16	5.00	127.00	1.025	26.06	1.028	26.11	$1^{1}/_{16}$-18	$1^{1}/_{16}$-18
18	1.375	34.93	5.00	127.00	1.131	28.73	1.134	28.80	$1^{3}/_{16}$-18	$1^{3}/_{16}$-18
20	1.510	38.35	5.00	127.00	1.256	31.90	1.263	32.08	$1^{5}/_{16}$-18	$1^{5}/_{16}$-18
22	1.625	41.28	5.00	127.00	1.381	35.08	1.384	35.15	$1^{7}/_{16}$-18	$1^{7}/_{16}$-18
24	1.760	44.70	5.00	127.00	1.506	38.25	1.511	38.38	$1^{9}/_{16}$-18	$1^{9}/_{16}$-18

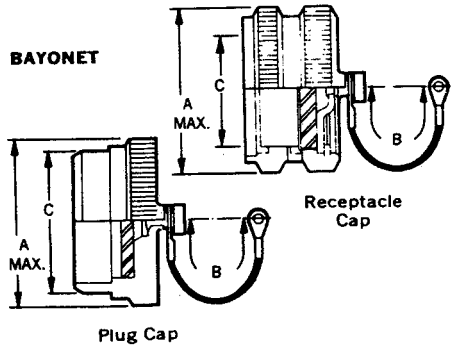


Protective metal caps provide an environmental seal for the connector face. They exclude dirt, dust, moisture, and other foreign materials from the face of unmated plugs and receptacles. The caps have a woven steel strap so they can be easily atached near their point of use.

ordering information

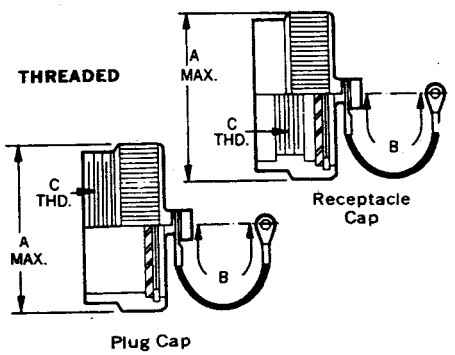
bayonet cap & chain part numbers

Size	Plug		Receptacle	
	Amphenol	MS	Amphenol	MS
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



threaded cap & chain part numbers

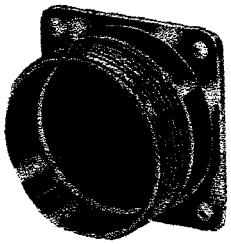
Size	Plug		Receptacle	
	Amphenol	MS	Amphenol	MS
10	48-2340-10	MS27292-1	48-2301-10	MS27294-1
12	48-2340-12	MS27292-2	48-2301-12	MS27294-2
14	48-2340-14	MS27292-3	48-2301-14	MS27294-3
16	48-2340-16	MS27292-4	48-2301-16	MS27294-4
18	48-2340-18	MS27292-5	48-2301-18	MS27294-5
20	48-2340-20	MS27292-8	48-2301-20	MS27294-8
22	48-2340-22	MS27292-6	48-2301-22	MS27294-6
24	48-2340-24	MS27292-9	48-2301-24	MS27294-9

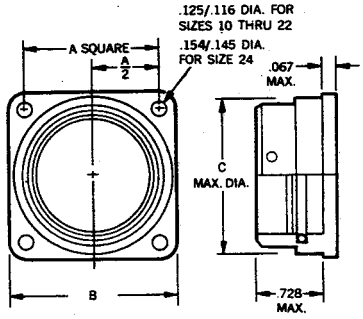


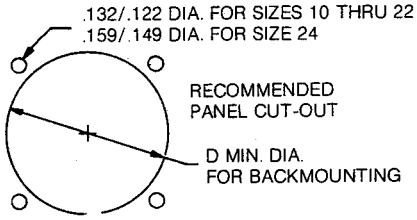
accessories

dummy receptacles

Dummy receptacles are used as an anchoring place for disconnected plugs. They 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.







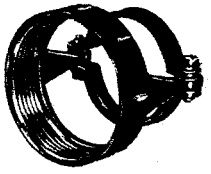
dimensions (same for bayonet and threaded receptacles)

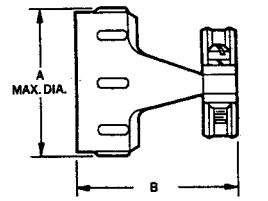
Size	Threaded Size UNEF-2A	A Square Inch ±.005	A Square MM ±.13	B MM ±.005	B MM ±.13	C Max. Dia. Inch	C Max. Dia. MM	D Min. Dia. Inch	D Min. Dia. MM
10	11/16-24	.719	18.26	.937	23.80	.696	17.68	.748	19.00
12	7/8-20	.812	20.62	1.031	26.19	.875	22.23	.913	23.19
14	15/16-20	.906	23.01	1.125	28.58	.935	23.75	.980	24.89
16	1 1/16-18	.969	24.61	1.250	31.75	1.062	26.97	1.107	28.12
18	1 3/16-18	1.062	26.97	1.343	34.11	1.187	30.15	1.209	30.71
20	1 5/16-18	1.156	29.36	1.437	36.50	1.312	33.32	1.337	33.96
22	1 3/16-18	1.250	31.75	1.562	39.67	1.437	36.50	1.452	36.88
24	1 9/16-18	1.375	34.93	1.703	43.26	1.562	39.67	1.577	40.06

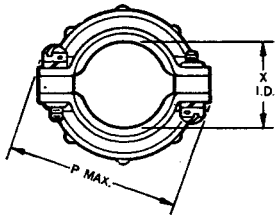
ordering information

Size	Bayonet Amphenol	Bayonet MS	Threaded Amphenol	Threaded MS
10	48-149-10000	MS27297-1	48-172-10000	MS27296-1
12	48-149-12000	MS27297-2	48-172-12000	MS27296-2
14	48-149-14000	MS27297-3	48-172-14000	MS27296-3
16	48-149-16000	MS27297-4	48-172-16000	MS27296-4
18	48-149-18000	MS27297-5	48-172-18000	MS27296-5
20	48-149-20000	MS27297-8	48-172-20000	MS27296-8
22	48-149-22000	MS27297-6	48-172-22000	MS27296-6
24	48-149-24000	MS27297-9	48-172-24000	MS27296-9

cable support assembly







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

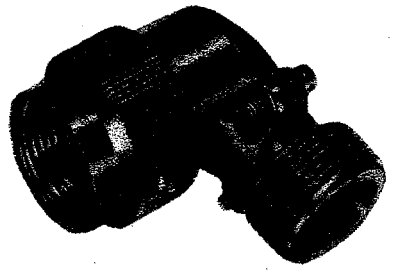
ordering information and dimensions (inches)

Size	Amphenol	MS	A Max. Dia. Inch	A Max. Dia. MM	B Inch ±.015	B MM ±.38	X I.D. Inch ±.38	X I.D. MM ±.015	Thread UNEF -2B	P Max. Inch	P Max. MM
8	48-2840	MS 27291-13	.582	14.78	.935	23.75	.180	4.57	7/16-28	.785	19.94
10	48-2341	MS 27291-1	.731	18.57	.935	23.75	.270	6.86	9/16-24	.914	23.22
12	48-2342	MS 27291-2	.919	23.34	.935	23.75	.400	10.16	3/4-20	1.026	26.06
14	48-2343	MS 27291-3	.981	24.92	1.170	29.72	.460	11.68	13/16-20	1.090	27.69
16	48-2344	MS 27291-4	1.106	28.09	1.170	29.72	.610	15.49	15/16-20	1.250	31.75
18	48-2345	MS 27291-5	1.231	31.27	1.170	29.72	.690	17.53	1 1/16-18	1.358	34.49
20	48-2643	MS 27291-14	1.356	34.44	1.170	29.72	.830	21.08	1 3/16-18	1.496	38.00
22	48-2346	MS 27291-6	1.481	37.62	1.170	29.72	.940	23.88	1 5/16-18	1.604	40.74
24	48-2644	MS 27291-15	1.606	40.79	1.170	29.72	1.040	26.42	1 7/16-18	1.740	44.20

right angle supports and adapters

Conduit adapters and cable support clamps allow right angle turns with added protection for the cable or wiring.

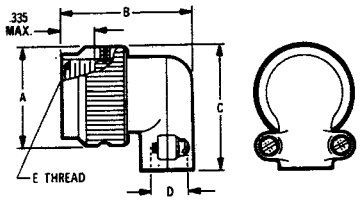
Closed back cable support clamps have a removable cover; open back cable support clamps have to protect the wires at the right angle bend.



ordering information and dimensions

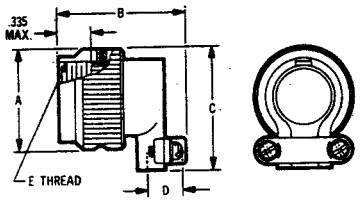
Size	Part Number		A Dia. Max.		B Max.		C Max.		D Max.		E Thread UNEF-2B
	Amphenol	MS	Inch	MM	Inch	MM	Inch	MM	Inch	MM	
8	48-2222-08100	MS27558-1	.672	17.07	1.200	30.48	.938	23.83	.245	6.22	7/16-28
10	48-2222-10100	MS27558-2	.797	20.24	1.320	33.53	1.049	26.64	.370	9.40	9/16-24
12	48-2222-12100	MS27558-3	1.016	25.81	1.320	33.53	1.248	31.70	.370	9.40	3/4-20
14	48-2222-14100	MS27558-4	1.110	28.19	1.487	37.77	1.330	33.78	.520	13.21	13/16-20
16	48-2222-16100	MS27558-5	1.234	31.34	1.470	37.34	1.447	36.75	.520	13.21	15/16-20
18	48-2222-18100	MS27558-6	1.360	34.54	1.588	40.34	1.577	40.06	.645	16.38	1 1/16-18
20	48-2222-20100	MS27558-7	1.485	37.72	1.759	44.68	1.698	43.13	.780	19.81	1 5/16-18
22	48-2222-22100	MS27558-8	1.610	40.89	1.759	44.68	1.820	46.23	.780	19.81	1 7/16-18
24	48-2222-24100	MS27558-9	1.735	44.07	2.027	51.49	1.945	49.40	1.065	27.05	1 7/16-18

closed right angle cable support



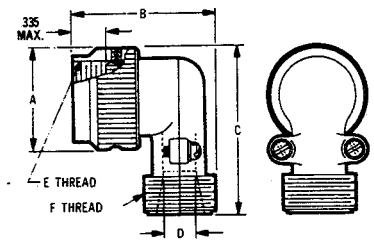
Size	Part Number		A Dia. Max.		B Max.		C Max.		D Max.		E Thread UNEF-2B
	Amphenol	MS	Inch	MM	Inch	MM	Inch	MM	Inch	MM	
8	48-2222-08200	MS27559-1	.672	17.07	1.173	29.79	.938	23.83	.201	5.11	7/16-18
10	48-2222-10200	MS27559-2	.797	20.24	1.293	32.84	1.049	26.64	.328	8.33	9/16-24
12	48-2222-12200	MS27559-3	1.016	25.81	1.293	32.84	1.248	31.70	.328	8.33	3/4-20
14	48-2222-14200	MS27559-4	1.110	28.19	1.460	37.08	1.330	33.78	.452	11.48	13/16-20
16	48-2222-16200	MS27559-5	1.234	31.34	1.443	36.65	1.447	36.75	.508	12.90	15/16-20
18	48-2222-18200	MS27559-6	1.360	39.54	1.561	39.65	1.577	40.06	.571	14.50	1 1/16-18
20	48-2222-20200	MS27559-7	1.485	37.72	1.732	43.99	1.698	43.13	.748	19.00	1 3/16-18
22	40-2222-22200	MS27559-8	1.610	40.89	1.732	43.99	1.819	46.23	.748	19.00	1 5/16-18
24	48-2222-24200	MS27559-9	1.735	44.07	2.000	50.80	1.945	49.40	.996	25.30	1 7/16-18

open right angle cable support



Part Number			A Dia. Max.		B Max.		C Max.		D Max.		E Thread UNEF-2B	F Thread UNEF-2A
	Amphenol	MS	Inch	MM	Inch	MM	Inch	MM	Inch	MM		
8	48-2222-08000	MS27557-1	672	17.07	1.300	33.02	1.403	35.64	.245	6.22	7/16-18	5/8-24
10	48-2222-10000	MS27557-2	797	20.24	1.420	36.07	1.514	38.46	.370	9.40	9/16-24	3/4-20
12	48-2222-12000	MS27557-3	1.016	25.81	1.420	36.07	1.713	43.51	.370	9.40	3/4-20	3/4-20
14	48-2222-14000	MS27557-4	1.110	28.19	1.575	40.01	1.795	45.59	.520	13.21	13/16-20	7/8-20
16	48-2222-16000	MS27557-5	1.234	31.34	1.558	39.57	1.912	48.56	.520	13.21	15/16-20	7/8-20
18	48-2222-18000	MS27557-6	1.360	39.54	1.675	42.55	2.042	51.87	.645	16.38	1 1/16-18	1-20
20	48-2222-20000	MS27557-7	1.485	37.72	1.863	47.32	2.163	54.94	.780	19.81	1 3/16-18	1 3/16-18
22	48-2222-22000	MS27557-8	1.610	40.89	1.863	47.32	2.285	58.04	.780	19.81	1 5/16-18	1 3/16-18
24	48-2222-24000	MS27557-9	1.735	44.07	2.118	53.80	2.410	61.21	1.065	27.05	1 7/16-18	1 7/16-18

right angle conduit adapter



Amphenol® miniature circular connectors

Poke-Home® contacts and tool applications

Contacts—When you order 48 Series connectors with contacts, the contact package contains enough contacts to complete the insert arrangement and have at least 2 spares left. The package also includes enough sealing plugs for at least 15% of the contacts in the insert, in any case a minimum of 3 sealing plugs. To provide proper sealing, insert unwired contacts and sealing plugs in all unused holes. (Use a #12 contact for a #1 shielded hole.) To order contacts and sealing plugs separately use the part numbers in the table below. Contacts may also be ordered in reels for use with automatic crimping tools.

Tools—Note that various tools are available for crimping, inserting, and removing each size contact. The MS 3191 tools are inactive for new procurement, but can be used if available.

Contact Size	Wire Size AWG	Max. Current Rating Amps.	AMPHENOL Part No. Pin	AMPHENOL Part No. Socket	MS Part No. Pin	MS Part No. Socket	Crimping Tool	Bushing (Positioner)	Crimp Jaw Setting Dia. (Insp.)	Insertion Tool	Removal Tool: Standard Connector	Removal Tool: Ultra-Mate® Connector
No. 20	24 22 20	3.0 5.0 7.5	48-1595-09	248-136-2001S-09	M39029/31-241	M39029/32-260	294-126 294-186 294-243 294-293 294-358 294-506 294-542	Included 294-1266 Turret Hd. Turret Hd. 294-444 Automatic 294-1889-01	031-041 .031-.041 .031-.041 ††	294-88 (MS24256A20) or 294-213	294-89 (MS24256R20)	294-203 (MS24256RH20)
No. 16	18 16	16 22	48-1825-09	248-136-1600S-09	M39029/31-229	M39029/32-248	294-126 294-243 294-293 294-358 294-506 294-542	Included Turret Hd. Turret Hd. 294-901 Automatic 294-1889-01	 .041-.053 .041-.053 ††	294-96 (MS24256A16)	294-97 (MS24256R16)	294-180 (MS24256RH16)
No. 12	14 12	32 41	48-1827-09	248-136-1200S-09	M39029/31-235	M39029/32-254	294-86 294-126 294-243 294-293 294-358 294-506 294-542	294-903 Included Turret Hd. Turret Hd. 294-903 Automatic 294-1889-01	.0625 .062-.072 .062-.072 ††	294-72 (MS24256A12)	294-73 (MS24256R12)	294-183 (MS24256RH12)
No. 1 (shielded)*	-- **** *****	3 1 1	48-1226-02 48-1226-54 48-1226-55	48-1227-02 48-1227-54 48-1227-55	MS27184-22P — —	MS27185-22S — —	357-100 294-289	294-1631	—	294-72† (MS24256A12)	294-73† (MS24256R12)	294-264
No. 2 (shielded)	***	7.5	48-2187-02	48-2188-02	MS27184-20P	MS27185-20S	294-289 294-358 357-100	294-1630 294-1015	—	294-128†	294-127†	294-184†

•294-542 Crimping tool complies with MIL-C-22520 specification.
††See data plate.
*Replaces No. 12 power contact.
**Accommodates cables RG174/U, RG179/U, RG-179B/U, RG179A/U, RG187/U, RG188/U and RG161/U as well as shielded wire. Can also accommodate Cable MIL-C-27500-22K1N6 (Extruded) or 22 AWG per MIL-C-7078 type II.
***Accommodates Cable MIL-C-27500-22K1N6, 20K1N6, 18K1N6 (Extruded) or 22, 20, 18 AWG, per MIL-C-7078 Type II.
****For use with RG195/U, RG180/U and RG180B/U.
*****Accommodates Cables RG178/U, RG178A/U, RG178B/U and RG196A/U.
†These tools are applicable to all #1 or #2 shielded contacts, respectively, not just contacts listed here.

NOTE: Complete information on crimping shielded contacts is given on pages 14-15.

grommet sealing plugs

Color Code	Size	AMPHENOL Part No.	MS Part Number
Yellow	12 & #1 Shielded	48-2221-12	MS27187-2
Blue	16	48-2221-16	MS27187-1
Red	20	48-2221-20	MS27186-1
White	#2 Shielded	48-1458-01	MS27187-4

reel contacts

	Amphenol Part No. 2000 contacts per reel (gold plated)
#20 Pin	48-1595-92000
#20 Socket	248-136-2001S-9200
#16 Pin	48-1825-92000
#16 Socket	248-136-1600S-9200
#12 Pin	48-1827-92000
#12 Socket	248-136-1200S-9200

Color Coding

PIN CONTACTS PER MIL-C-39029/31

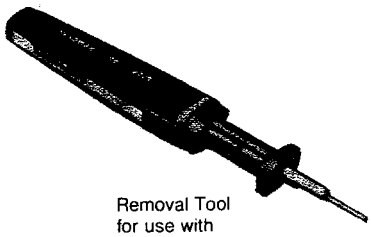
Contact Size	Military P/N	Color Code Bands 1	2	3	Amphenol Part Number	Replaces Military P/N	Crimp Tool Positioner Color Code	Wire Size	Insulation O.D.	Stripping Lengths
20	M39029/31-241	Red	Yellow	Brown	48-1595-09	MS 24254-20P	Red	20-22-24 AWG	(1.02) (2.29) .040/.090	(4.75) (5.94) .187/.234
16	M39029/31-229	Red	Red	White	48-1825-09	MS 24254-16P	Blue	18-16 AWG	(1.73) (3.30) .068/.130	(5.59) (6.60) .220/.260"
12	M39029/31-235	Red	Orange	Green	48-1827-09	MS 24254-12P	Yellow	17-12 AWG	(2.69) (4.32) .106/.170"	(5.59) (6.60) .220/.260"

SOCKET CONTACTS PER MIL-C-39029/32

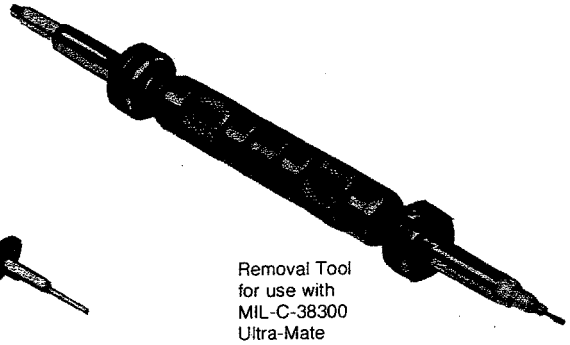
Contact Size	Military P/N	Color Code Bands 1	2	3	Amphenol Part Number	Replaces Military P/N	Crimp Tool Positioner Color Code	Wire Size	Insulation O.D.	Stripping Lengths
20	M39029/32-260	Red	Blue	Black	248-136-2001S-09	MS 24255-20S	Red	20-22-24 AWG	(1.02) (2.29) .040/.090"	(4.75) (5.94) .187/.234"
16	M39029/32-248	Red	Yellow	Gray	248-136-1600S-09	MS24255-16S	Blue	18-16 AWG	(1.73) (3.30) .068/.130"	(5.59) (6.60) .220/.260"
12	M39029/32-254	Red	Green	Yellow	248-136-1200S-09	MS25255-12S	Yellow	14-12 AWG	(2.69) (4.32) .106/.170"	(5.59) (6.60) .220/.260"

Poke-Home® contact insertion and removal tools

Insertion Tool
for use with
MIL-C-26500 &
MIL-C-38300
Connectors



Removal Tool
for use with
MIL-C-26500
Connectors



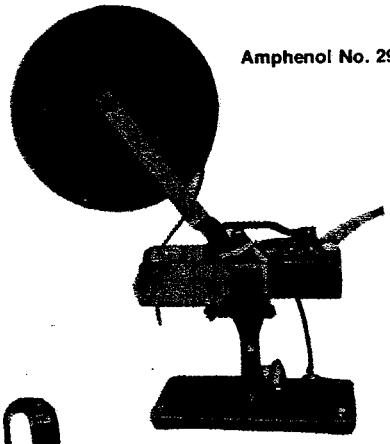
Removal Tool
for use with
MIL-C-38300
Ultra-Mate
Connectors

Insertion Tool Part No.			Removal Tool Part No.	
AMPHENOL	MS	Contact Size	AMPHENOL	MS
294-88	2456A20	#20	294-89	24256R20
294-96	24256A16	#16	294-97	24256R16
294-72	24256A12	#12, #1 Shielded	294-73	24256R12
294-128	—	#2 Shielded	294-127	

Ultra-Mate Contact Removal Tool

Contact Size	MS	AMPHENOL Part No.
#20	24256RH20	294-203
#16	24256RH16	294-180
#12	24256RH12	294-183
#1 Shielded	—	294-264
#2 Shielded	—	294-184

Poke-Home® contact crimping tools



Amphenol No. 294-506

Amphenol No. 357-100

Amphenol No. 294-528 (.160 Hex.) or No. 294-529 (.128 Hex.)

M22520/1-01 Amphenol No. 294-542

Amphenol No. 294-506
Pneumatically operated, bench mounted automatic-feed crimping tool.

Amphenol No. 357-100
Crimping tool for center contact of #1 shielded contact. Used with 294-1631 positioner. For #2 shielded contact use 294-1630 positioner.

Amphenol No. 294-528 (.160 Hex.) or No. 294-529 (.128 Hex.)
Full cycle crimping tools with hex dies for crimping outer ferrule of #1 and #2 shielded contacts.

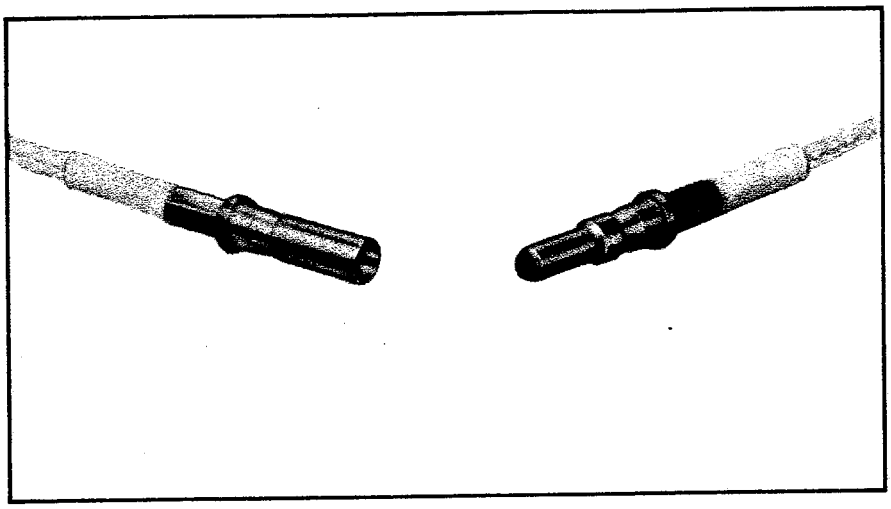
M22520/1-01 Amphenol No. 294-542
Adjustable crimping tool for pins and sockets with MS3190 crimp barrels. Use with M22520/1-02 turret head for following sizes.

Shielded Contacts—can be crimped with the following tools:

Center Contact	Tool#	Positioner #	Outer Ferrule •
#1 Shielded	294-268	294-1631	294-529
#2 Shielded	294-268	294-1630	294-528

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

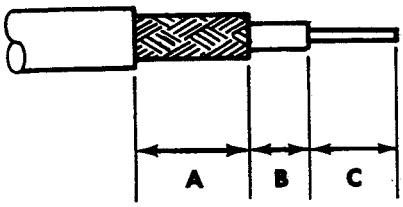
shielded contact assembly procedure



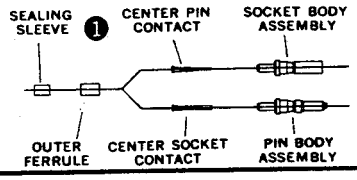
Shielded Contacts
After Crimping

cable stripping

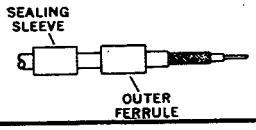
Strip cable jacket, braid, and dielectric to the dimensions shown in the table on page 15. Make all cuts square and sharp, being careful not to nick braid, dielectric, or center conductor when cutting. If conductor ends fray, twist them to their normal lay.



Exploded Views of Shielded Contact Types



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 ❷ and ❸; for ❸ slide spacer under wire braid.

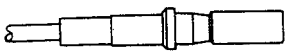


2 Insert stripped center conductor into contact until wire shows through inspection hole and dielectric (❶,❹, ❺) or spacer (❷, ❸) butts against contact. Fully seat contact in nest bushing of crimp tool and crimp in one full stroke. (Follow same crimping procedures except use nest bushing crimping tool from table on page 15.)

3 Slightly flare out ends of wire braid to facilitate insertion of inner ferrule of body assembly. (Do not comb braid.)

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.

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 on page 15. Then, for ❶, ❸ and ❺, slide sealing sleeve toward contact until sleeve touches outer ferrule.



6 Insert the assembled shielded contact into the connector in the same way as the standard Poke Home® contact, with applicable insertion tool (see page 13). This completes assembly for ❶, ❷, ❸, and ❺.

7 To complete assembly for ❹, push sealing boot into connector grommet until O-ring riser of boot snaps into place and seals the assembly.