

Amphenol MIL-DTL-26482 Series II MB (Matrix®)



HIGH-PERFORMANCE MINIATURE CONNECTOR PERFECT FOR AEROSPACE APPLICATIONS

Amphenol's Matrix® MIL-DTL-26482 series II miniature cylindrical connectors have a quick-mating, three-point bayonet coupling system. Given their small size and high-quality contact retention and seal, the MB series is excellent for high-reliability applications in the harshest conditions, including the aerospace industry.

- Space-rated Class G outgassing available in 48 hours
- Mates with all MIL-DTL-26482 series I connectors

APPLICATIONS

- Commercial and military aircraft
- High-temperature industrial equipment
- Instrumentation
- Avionics

FEATURES

HIGH-QUALITY CONTACT SYSTEM

Amphenol's MB connector series uses industry-standard M39029 crimp-style contacts and a field-proven contact retention clip that locks the contact into place while allowing easy insertion and removal with simple, low-cost plastic tools.

WIDE RANGE OF CABLE ACCESSORIES, INCLUDING MILITARY-STANDARD

Unlike MIL-DTL-26482 series I style connectors, MIL-DTL-26482 Series II style are supplied without rear accessories but with military-standard rear threads. This permits a choice from one of the broadest array of endbells, including M85049-standard endbells, and from low-cost, simple cable tie versions to fully environmentally-sealed EMI-shielded endbells.

BROAD OPERATING TEMPERATURES

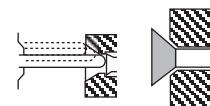
MBs use high-quality silicone for the peripheral, interfacial and wire seals. This, along with the stable hard dielectric insert material that houses the contact retention clip, provide operating temperatures from -85°F to +392°F (-65°C to +200°C).

REAR CONTACT INSERTION AND RELEASE SYSTEM

Used properly, the insertion and extraction tools never touch, come in contact with or damage the interfacial seals, eliminating a common problem with front-release contact systems.

CORK-IN-A-BOTTLE INTERFACIAL SEAL SYSTEM

Socket inserts have hard, dielectric, funnel-shaped contact lead-ins that not only assist in aligning the contacts when mating, but provide compression of the raised individual contact seals on the high-quality silicone interfacial seals of the pin insert.



TECHNICAL
SPECIFICATIONS

MATERIALS & FINISHES

Shell	High-grade aluminum alloy per QQ-A-367, QQ-A-591 or QQ-A-225; stainless steel 303 grade (AMS 5640)
Jam Nut	Aluminum alloy per QQ-A-225
Coupling Nut	High-grade aluminum alloy per QQ-A-591; stainless steel 303 grade (AMS 5640)
Plating	Electroless nickel per MIL-C-26074 class 3; 4 grade B, or olive drab chromate over cadmium over nickel per QQ-P-416 black-anodized non-conductive, black zinc conductive
Bayonet Pins	Passivated stainless steel per QQ-S-763
Contacts	Copper alloy
Plating	Gold-plated per MIL-G-45204 50 microinches
Insulator	Rigid-plastic dielectric
Grommet & Seals	Silicone-based elastomer

ELECTRICAL DATA

Working & Test Voltage

SERVICE RATING	WORKING		TEST	
	At Sea Level VAC RMS	70,000 feet ALTITUDE VAC RMS	At Sea Level VAC RMS	70,000 feet ALTITUDE VAC RMS
I	600	300	1,500	375
II	1,000	450	2,300	500

Current Rating	WIRE SIZE AWG	CONTACT SIZE	MAX. CURRENT FOR TEST IN AMPS	POTENTIAL DROP MILLIVOLT AT 77°F, (25°C)
	24	20	3	<45
	20	20	7.5	<55
	20	16	7.5	<45
	16	16	13	<50
	14	12	17	<45
	12	12	23	<50

Wire Range Sizes 24 – 12 AWG

Insulation Resistance 5,000 megohms minimum at 77°F (25°C)
500 megohms minimum at 392°F (200°C) Class L and
347°F (175°C) Class W

MECHANICAL

Operating Temperature Electroless nickel and olive drab chromate over cadmium over nickel
-85°F up to +392°F (-65°C up to +200°C)

Wire Sealing Range

CONTACT SIZE	WIRE SEALING RANGE MIN. INCH (MM)	WIRE SEALING RANGE MAX. INCH (MM)
20	.040 (1.02)	.083 (2.11)
16	.053 (1.35)	.103 (2.62)
12	.097 (2.46)	.158 (4.01)

CONTACT SIZE	WIRE SIZE AWG	STRIP LENGTH INCH (MM)
20	20-24	.188 (4.76)
16	16-20	.281 (7.14)
12	12-14	.281 (7.14)

Mating Life	500 cycles minimum, 250 cycles minimum for shielded plug								
Salt Spray	Class L, 48 hours unmated; Class W, 500 hours mated; 452 hours mated per MIL-STD-1344 Method, 1001 per MIL-DTL-26482 black zinc, 500 hours								
Heat	All platings and materials, +392°F (+200°C); for 1000 hours to MIL-STD-1344 Method 1005.1								
Chemical Resistance	Tested unmated according to MIL-DTL-26482 4.6.28 for hydraulic fluid, lubricating oil, deicing fluids, jet fuels, solvents and coolants								
Vibration	10 to 2000Hz (20g's) 10 microseconds maximum discontinuity. To MIL-STD-1344 Method 2005 per MIL-DTL-26482								
Shock	150g's 6ms duration, three major axes. 10 microsecond maximum discontinuity								
Contact Type	Crimp, coax, twinax, printed circuit board, and fiber optic								
Number of Circuits	3 to 61								
Contact Insertion & Extraction	Insertion from rear of connector with simple plastic or high-quality metal hand-tool. Extraction from rear with plastic or high-quality metal hand-tools								
Contact Retention	Per MIL-STD-1344A Method 2007 per MIL-DTL-26482 <table border="1" data-bbox="727 1003 1188 1129"> <thead> <tr> <th>CONTACT SIZE</th> <th>AXIAL LOAD POUNDS MIN.</th> </tr> </thead> <tbody> <tr> <td>20</td> <td>20</td> </tr> <tr> <td>16</td> <td>25</td> </tr> <tr> <td>12</td> <td>30</td> </tr> </tbody> </table>	CONTACT SIZE	AXIAL LOAD POUNDS MIN.	20	20	16	25	12	30
CONTACT SIZE	AXIAL LOAD POUNDS MIN.								
20	20								
16	25								
12	30								
Polarization	Five-keyway, three-point bayonet with optional rotational polarization. ↔ See page 173.								
Approvals	MIL-DTL-26482								

Excerpt from MIL-DTL-26482H

3.7.4 **JAN and J marking.** The United States Government has adopted and is exercising legitimate control over the certification marks "JAN" and "J", respectively, to indicate that items so marked or identified are manufactured to, and meet all the requirements of specifications. Accordingly, items acquired to, and meeting all of the criteria specified herein and in applicable specifications shall bear the certification mark "JAN" except that items too small to bear the certification mark "JAN" shall bear the letter "J". The "JAN" or "J" shall be placed immediately before the PIN except that if such location would place a hardship on the manufacturer in connection with such marking, the "JAN" or "J" may be located on the first line above or below the PIN. Items furnished under contracts or orders which either permit or require deviation from the conditions or requirements specified herein or in applicable specifications shall not bear "JAN" or "J". In the event an item fails to meet the requirements of this specification and the applicable specification sheets, the manufacturer shall remove completely the military PIN and the "JAN" or the "J" from the sample tested and also from all items represented by the sample. The "JAN" or "J" certification mark shall not be used on products acquired to contractor drawings or specification. The United States Government has obtained Certificate of Registration Number 504,860 for the certification mark "JAN" and Registration Number 1,586,261 for the certification mark "J".

PIN = Part Identification Number

CREATE YOUR PART NUMBER USING THESE SIX STEPS

1	2	3	4	5	6
MS3470^o	L^o	24-61	P	W	-LC

SHELL STYLE FINISH LAYOUT CONTACT ROTATION MODIFIER
 (military part number example)

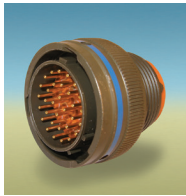
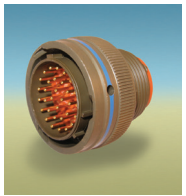
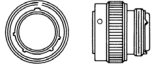
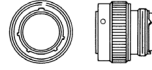
1	2	3	4	5	6
MB10*	B*	24-61	P	W	-A15

SHELL STYLE FINISH LAYOUT CONTACT ROTATION MODIFIER
 (commercial part number example)

STEP 1: SELECT SHELL STYLE, PLUG OR RECEPTACLE

Mates with


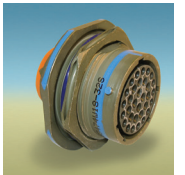
PLUGS

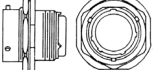
MS3476 (MB16)
Standard Plug +

RECEPTACLES







MS3470 (MB10)
Narrow Flange Receptacle +

MS3471 (MB13)
Cable Receptacle

MS3472 (MB11)
Wide Flange Receptacle

MS3474 (MB14)
Jam Nut Receptacle +

+ Most popular

STEP 2: SELECT FINISH

- L^o (R)*** = Electroless Nickel (RoHS)
- W^o** = Olive Drab Chromate over Cadmium over Nickel 500 Hour Salt Spray
- G*** = Stainless Steel 303 grade (AMS 5640)
- A^o** = Black Anodized
- B*** = Conductive Black Alloy (RoHS with A15 mod code)

* Commercial
^o Military
 ** Green Zinc & Durmalon platings are available, please contact us for details.

NEED HELP? Our engineers will help you find the most cost-effective solution for your application. Contact us via our online technical request form at www.peigenesis.com/technical-support

STEP 3: SELECT LAYOUT

Listed by shell size. For listing by number of contacts, ⇨ see page 174.

LAYOUT NUMBER	SERVICE RATING	TOTAL NUMBER OF CONTACTS	20	16	12	ROTATIONS			
						W	X	Y	Z
8-33	I	3	3			90	-	-	-
8-98	I	3	3			-	-	-	-
10-6	I	6	6			90	-	-	-
12-3	II	3		3		-	-	180	-
12-8	I	8	8			90	112	203	292
12-10	I	10	10			60	155	270	295
14-4	I	4			4	45	-	-	-
14-5	II	5		5		40	92	184	273
14-9S	I	9	5		4	15	90	180	270
14-12	I	12	8	4		43	90	-	-
14-15	I	15	14	1		17	110	155	234
14-18	I	18	18			15	90	180	270
14-19	I	19	19			30	165	315	-
16-8	II	8		8		54	152	180	331
16-23S	I	23	22	1		158	270	-	-
16-26	I	26	26			60	-	275	338
18-8	I	8			8	180	-	-	-
18-11S	II	11		11		62	119	241	340
18-30S	I	30	29	1		180	193	285	350
18-32	I	32	32			85	138	222	265
20-16	II	16		16		238	318	333	347
20-24S	I	24	24			70	145	215	290
20-39	I	39	37	2		63	144	252	333
20-41	I	41	41			45	126	225	-
22-12S	I	12			12	-	-	-	-
22-19S	I	19			19	15	90	225	308
22-21	II	21		21		16	135	175	349
22-32S	I	32	32			72	145	215	288
22-41	I	41	27	14		39	135	264	-
22-55	I	55	55			30	142	226	314
22-95S	I	32	26		6	26	180	266	-
24-19S	II	19			19	30	165	315	-
24-31	I	31		31		90	225	255	-
24-61	I	61	61			90	180	270	324

Arrangements designated with an **S** are tooled in socket only.

STEP 4: SELECT CONTACT

P = Pin
S = Socket
A = Less Pin Contacts
B = Less Socket Contact

The "A" and "B" designators are used for contacts other than power (PCB, coax, thermocouple, or fibre optic contacts)

STEP 5: SELECT ROTATION

⇨ See chart above (Omit for normal)

W, X, Y, Z

STEP 6: SELECT MODIFIER

For other commercial modifications, i.e., less tools, with PC contact or with endbell, please contact us. (Omit for standard contacts)

A15* = for use with B class for conductive black alloy finish
LC = for use with standard contacts, but supplied without contacts, seal plugs or tools (PO must state "Less Contacts")

NOTE: LC is not marked on part

* Commercial and not available as a shielded plug

LAYOUTS BY NUMBER OF CONTACTS

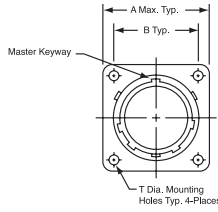
○ 20 ● 16 ◐ 12

Drawing not to scale; mating-face view of pin insert shown (socket view is opposite)

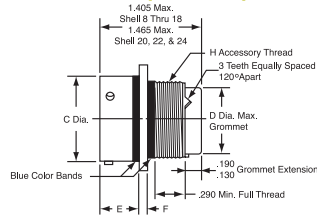
CONTACTS	3	4	5	6	8	9				
SHELL SIZE/LAYOUT # OF CONTACTS SERVICE RATING	8-33 3-#20 I	8-98 3-#20 I	12-3 3-#16 II	14-4 4-#12 I	14-5 5-#16 II	10-6 6-#20 I	12-8 8-#20 I	16-8 8-#16 II	18-8 8-#12 I	14-9S 5-#20, 4-#12 I
CONTACTS	10	11	12	15	16	18				
SHELL SIZE/LAYOUT # OF CONTACTS SERVICE RATING	12-10 10-#20 I	18-11S 11-#16 II	14-12 8-#20, 4-#16 I	22-12S 12-#12 I	14-15 14-#20, 1-#16 I	20-16 16-#16 II	14-18 18-#20 I			
CONTACTS	19	21	23	24						
SHELL SIZE/LAYOUT # OF CONTACTS SERVICE RATING	14-19 19-#20 I	22-19S 19-#12 I	24-19S 19-#12 II	22-21 21-#16 II	16-23S 22-#20, 1-#16 I	20-24S 24-#20 I				
CONTACTS	26	30	31	32						
SHELL SIZE/LAYOUT # OF CONTACTS SERVICE RATING	16-26 26-#20 I	18-30S 29-#20, 1-#16 I	24-31 31-#16 I	18-32 32-#20 I	22-32S 32-#20 I	22-95S 26-#20, 6-#12 I				
CONTACTS	39	41	55	61						
SHELL SIZE/LAYOUT # OF CONTACTS SERVICE RATING	20-39 37-#20, 2-#16 I	20-41 41-#20 I	22-41 27-#20, 14-#16 I	22-55 55-#20 I	24-61 61-#20 I					

S = Arrangements are tooled in socket only.

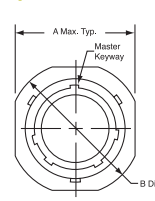
RECEPTACLES



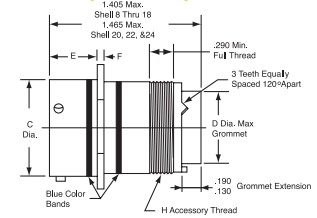
MB10 (MS3470)



MB11 (MS3472)



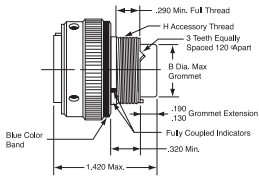
MB13 (MS3471)



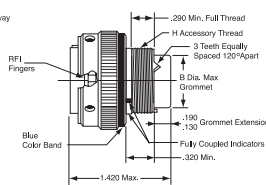
SHELL SIZE	A MAX		B ± .005 (± .127)		B DIA. ± .020 (± .508)	C DIAMETER ± .003 (± .076)	D DIAMETER MAX	E MAX/MIN		F ± .016 (± .406)	H THREAD CLASS 2A	T ± .005 (± .127)	
	MS3470/ MB10 MS3471/ MB13	MS3472/ MB11	MS3470/ MB10	MS3472/ MB11	MS3471/ MB13			MS3470/ MB10 MS3471/ MB13	MS3472/ MB11			MS3470/ MB10	MS3472/ MB11
8	0.828 (21.0)	1.065 (27.1)	0.594 (15.1)	0.734 (18.6)	0.938 (23.8)	0.471 (12.0)	0.305 (7.7)	.462/.431 (11.7/10.9)	.493/.462 (12.5/11.7)	0.062 (1.6)	.5000-20 UNF	0.120 (3.0)	0.150 (3.8)
	0.954 (24.2)	1.141 (29.0)	0.719 (18.3)	0.812 (20.6)	1.062 (27.0)	0.588 (14.9)	0.405 (10.3)	.462/.431 (11.7/10.9)	.493/.462 (12.5/11.7)	0.062 (1.6)	.6250-24 UNEF	0.120 (3.0)	0.150 (3.8)
10	1.047 (26.6)	1.266 (32.2)	0.812 (20.6)	0.938 (23.8)	1.156 (29.4)	0.748 (19.0)	0.531 (13.5)	.462/.431 (11.7/10.9)	.493/.462 (12.5/11.7)	0.062 (1.6)	.7500-20 UNF	0.120 (3.0)	0.150 (3.8)
	1.141 (29.0)	1.360 (34.5)	0.906 (23.0)	1.031 (26.2)	1.250 (31.8)	0.873 (22.2)	0.665 (16.9)	.462/.431 (11.7/10.9)	.493/.462 (12.5/11.7)	0.062 (1.6)	.8750-20 UNF	0.120 (3.0)	0.150 (3.8)
12	1.234 (31.3)	1.453 (36.9)	0.969 (24.6)	1.125 (28.6)	1.344 (34.1)	0.998 (25.3)	0.790 (20.1)	.462/.431 (11.7/10.9)	.493/.462 (12.5/11.7)	0.062 (1.6)	1.0000-20 UNF	0.120 (3.0)	0.150 (3.8)
	1.328 (33.7)	1.532 (38.9)	1.062 (27.0)	1.203 (30.6)	1.438 (36.5)	1.123 (28.5)	0.869 (22.1)	.462/.431 (11.7/10.9)	.493/.462 (12.5/11.7)	0.062 (1.6)	1.0625-18 UNF	0.120 (3.0)	0.150 (3.8)
14	1.453 (36.9)	1.688 (42.9)	1.156 (29.4)	1.297 (32.9)	1.562 (39.7)	1.248 (31.7)	0.994 (25.2)	.587/.556 (14.9/14.1)	.587/.556 (14.9/14.1)	0.094 (2.4)	1.1875-18 UNF	0.120 (3.0)	0.150 (3.8)
	1.578 (40.1)	1.766 (44.9)	1.250 (31.8)	1.375 (34.9)	1.688 (42.9)	1.373 (34.9)	1.119 (28.4)	.587/.556 (14.9/14.1)	.587/.556 (14.9/14.1)	0.094 (2.4)	1.3125-18 UNF	0.120 (3.0)	0.150 (3.8)
16	1.703 (43.3)	1.891 (48.0)	1.375 (34.9)	1.500 (38.1)	1.812 (46.0)	1.498 (38.0)	1.244 (31.6)	.620/.589 (15.7/15.0)	.620/.589 (15.7/15.0)	0.094 (2.4)	1.4375-18 UNF	0.147 (3.7)	0.150 (3.8)
	1.828 (46.4)	2.016 (51.4)	1.462 (37.1)	1.597 (40.4)	1.912 (48.8)	1.619 (41.3)	1.369 (34.8)	.620/.589 (15.7/15.0)	.620/.589 (15.7/15.0)	0.094 (2.4)	1.5625-18 UNF	0.147 (3.7)	0.150 (3.8)

PLUGS

MB16 (MS3476)



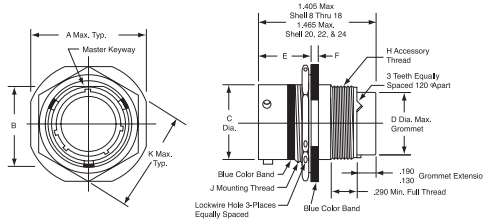
MB18 (MS3475)



SHELL SIZE	A DIAMETER MAX.	B DIAMETER MAX.	H THREAD CLASS 2A
8	0.782 (19.9)	0.305 (7.7)	.5000-20 UNF
10	0.926 (23.5)	0.405 (10.3)	.6250-24 UNEF
12	1.043 (26.5)	0.531 (13.5)	.7500-20 UNF
14	1.183 (30.0)	0.665 (16.9)	.8750-20 UNF
16	1.305 (33.1)	0.790 (20.1)	1.0000-20 UNF
18	1.391 (35.3)	0.869 (22.1)	1.0625-18 UNF
20	1.530 (38.9)	0.994 (25.2)	1.1875-18 UNF
22	1.656 (42.1)	1.119 (28.4)	1.3125-18 UNF
24	1.777 (45.1)	1.244 (31.6)	1.4375-18 UNF

JAM NUT RECEPTACLE

MB14 (MS3474)



SHELL SIZE	A MAX	B ± .005 (± 0.127)	C DIAMETER ± .003 (± 0.076)	D DIAMETER MAX	E MAX/MIN	F MAX/MIN	H THREAD CLASS 2A	K MAX	J MOUNTING THREAD CLASS 2A
8	0.954 (24.2)	0.525 (13.3)	0.471 (12.0)	0.305 (7.7)	.707/.658 (17.9/16.7)	.113/.086 (2.8/2.1)	.5000-20 UNF	0.767 (19.5)	.5625-24 UNF
10	1.078 (27.4)	0.650 (16.5)	0.588 (14.9)	0.405 (10.3)	.707/.658 (17.9/16.7)	.113/.086 (2.8/2.1)	.6250-24 UNEF	0.892 (22.7)	.6875-24 UNF
12	1.266 (32.2)	0.813 (20.7)	0.748 (19.0)	0.531 (13.5)	.707/.658 (17.9/16.7)	.113/.086 (2.8/2.1)	.7500-20 UNF	1.079 (27.4)	.8750-20 UNF
14	1.391 (35.3)	0.937 (23.8)	0.873 (22.2)	0.665 (16.9)	.707/.658 (17.9/16.7)	.113/.086 (2.8/2.1)	.8750-20 UNF	1.205 (30.6)	1.0000-20 UNF
16	1.516 (38.5)	1.061 (26.9)	0.998 (25.3)	0.790 (20.1)	.707/.658 (17.9/16.7)	.113/.086 (2.8/2.1)	1.0000-20 UNF	1.329 (33.8)	1.1250-18 UNF
18	1.641 (41.7)	1.186 (30.1)	1.123 (28.5)	0.869 (22.1)	.707/.658 (17.9/16.7)	.113/.086 (2.8/2.1)	1.0625-18 UNF	1.455 (37.0)	1.2500-18 UNF
20	1.828 (46.4)	1.311 (33.3)	1.248 (31.7)	0.994 (25.2)	.772/.721 (19.6/18.3)	.148/.096 (3.7/2.4)	1.1875-18 UNF	1.579 (40.1)	1.3750-18 UNF
22	1.954 (49.6)	1.436 (36.5)	1.373 (34.9)	1.119 (28.4)	.772/.721 (19.6/18.3)	.148/.096 (3.7/2.4)	1.3125-18 UNF	1.705 (43.3)	1.5000-18 UNF
24	2.078 (52.8)	1.561 (39.6)	1.498 (38.0)	1.244 (31.6)	.772/.721 (19.6/18.3)	.148/.096 (3.7/2.4)	1.4375-18 UNF	1.829 (46.5)	1.6250-18 UNF

All dimensions in inches (millimeters in parenthesis)

CONTACTS

PINS

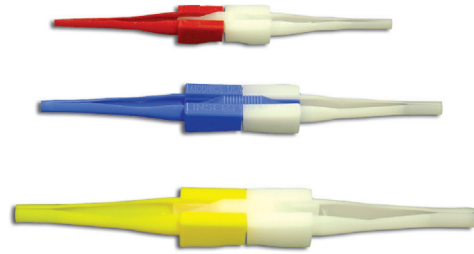
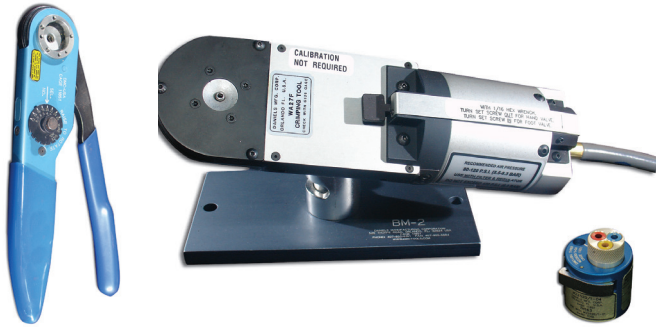
CONTACT SIZE	WIRE SIZE AWG	PIN CONTACT PART NUMBER	COLOR BANDS			WIRE STRIP LENGTHS	WIRE INSULATION RANGE		WIRE HOLE FILLER	COLOR
			1	2	3		MIN	MAX		
20	20, 22 & 24	M39029/4-110	Brown	Brown	Black	.1875 (4.77)	.040 (1.02)	.083 (2.11)	MS27488-20-2	Red
16	16, 18 & 20	M39029/4-111	Brown	Brown	Brown	.2812 (7.14)	.053 (1.35)	.103 (2.62)	MS27488-16-2	Blue
12	12 & 14	M39029/4-113	Brown	Brown	Orange	.2812 (7.14)	.097 (2.46)	.158 (4.01)	MS27488-12-2	Yellow
20 Alumel*	20, 22 & 24	M39029/9-134	Brown	Orange	Yellow	.1875 (4.77)	.040 (1.02)	.083 (2.11)	MS27488-20-2	Red
20 Chromel*	20, 22 & 24	M39029/9-135	Brown	Orange	Green	.1875 (4.77)	.040 (1.02)	.083 (2.11)	MS27488-20-2	Red
16 Fiber Optic*	-	MIL-T-29504/10	-	-	-	-	-	-	-	-
12 Coax*	-	Contact us	-	-	-	-	-	-	-	-

SOCKETS

CONTACT SIZE	WIRE SIZE AWG	PIN CONTACT PART NUMBER	COLOR BANDS			WIRE STRIP LENGTHS	WIRE INSULATION RANGE		WIRE HOLE FILLER	COLOR
			1	2	3		MIN	MAX		
20	20, 22 & 24	M39029/5-115	Brown	Brown	Green	.1875 (4.77)	.040 (1.02)	.083 (2.11)	MS27488-20-2	Red
16	16, 18 & 20	M39029/5-116	Brown	Brown	Blue	.2812 (7.14)	.053 (1.35)	.103 (2.62)	MS27488-16-2	Blue
12	12 & 14	M39029/5-118	Brown	Brown	Grey	.2812 (7.14)	.097 (2.46)	.158 (4.01)	MS27488-12-2	Yellow
20 Alumel*	20, 22 & 24	M39029/10-140	Brown	Yellow	Black	.1875 (4.77)	.040 (1.02)	.083 (2.11)	MS27488-20-2	Red
20 Chromel*	20, 22 & 24	M39029/10-141	Brown	Yellow	Brown	.1875 (4.77)	.040 (1.02)	.083 (2.11)	MS27488-20-2	Red
16 Fiber Optic*	-	MIL-T-29504/11	-	-	-	-	-	-	-	-
12 Coax*	-	Contact us	-	-	-	-	-	-	-	-

All dimensions in inches (millimeters in parenthesis) * Special – contact us for information.

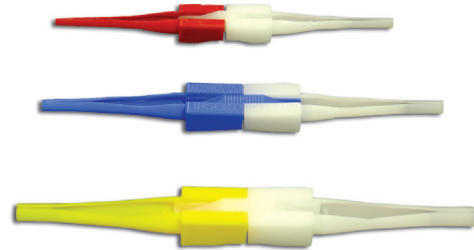
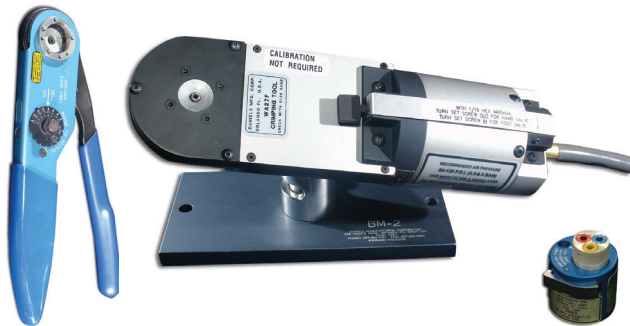
PINS



CONTACT SIZE	HAND-CRIMP TOOL	POWER-CRIMP TOOL	TURRET HEADS	USE LOCATOR COLOR	METAL		PLASTIC		
					INSERTION TOOL	EXTRACTION TOOL	INSERTION/ EXTRACTION TOOL	INSERTION TIP COLOR	EXTRACTION TIP COLOR
20	M22520/1-01	WA27FH	M22520/1-02	Red	DAK83-20B	DRK83-20B	M81969/14-11	Red	White
16	M22520/1-01	WA27FH	M22520/1-02	Blue	DAK83-16B	DRK83-16B	M81969/14-03	Blue	White
12	M22520/1-01	WA27FH	M22520/1-02	Yellow	DAK83-12B	DRK83-12B	M81969/14-04	Yellow	White
20 Alumel*	M22520/1-01	WA27FH	M22520/1-02	Red	DAK83-20B	DAK83-20B	M81969/14-11	Red	White
20 Chromel*	M22520/1-01	WA27FH	M22520/1-02	Red	DAK83-20B	DAK83-20B	M81969/14-11	Red	White
16 Fiber Optic*	-	-	-	-	-	-	-	-	-
12 Coax*	-	-	-	-	-	-	-	-	-

†† Contact us for more tool accessories.

SOCKETS

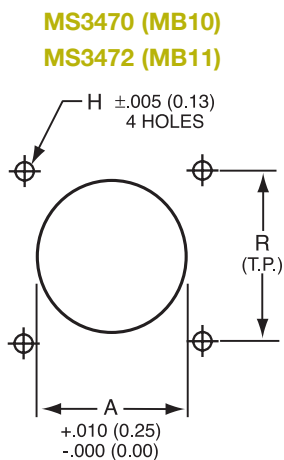


CONTACT SIZE	HAND-CRIMP TOOL	POWER-CRIMP TOOL	TURRET HEADS	USE LOCATOR COLOR	METAL		PLASTIC		
					INSERTION TOOL	EXTRACTION TOOL	INSERTION/ EXTRACTION TOOL	INSERTION TIP COLOR	EXTRACTION TIP COLOR
20	M22520/1-01	WA27FH	M22520/1-02	Red	DAK83-20B	DRK83-20B	M81969/14-11	Red	White
16	M22520/1-01	WA27FH	M22520/1-02	Blue	DAK83-16B	DRK83-16B	M81969/14-03	Blue	White
12	M22520/1-01	WA27FH	M22520/1-02	Yellow	DAK83-12B	DRK83-12B	M81969/14-04	Yellow	White
20 Alumel*	M22520/1-01	WA27FH	M22520/1-02	Red	DAK83-20B	DAK83-20B	M81969/14-11	Red	White
20 Chromel*	M22520/1-01	WA27FH	M22520/1-02	Red	DAK83-20B	DAK83-20B	M81969/14-11	Red	White
16 Fiber Optic*	-	-	-	-	-	-	-	-	-
12 Coax*	-	-	-	-	-	-	-	-	-

†† Contact us for more tool accessories.

All dimensions in inches (millimeters in parenthesis)

MB FLANGED PANEL CUTOUTS

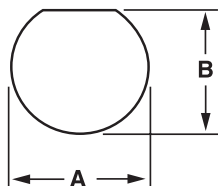


SHELL SIZE	MS3470/MB10 NARROW FLANGE				MS3472/MB11 WIDE FLANGE		
	A DIAMETER	R	SCREW H	SIZE	R	SCREW H	SIZE
8	.620 (15.7)	.594 (15.0)	.125 (3.1)	#4	.734 (18.6)	.155 (3.9)	#6
10	.740 (18.8)	.719 (18.2)	.125 (3.1)	#4	.812 (20.6)	.155 (3.97)	#6
12	.864 (21.9)	.812 (20.6)	.125 (3.1)	#4	.938 (23.9)	.155 (3.97)	#6
14	.990 (25.1)	.906 (23.0)	.125 (3.1)	#4	1.031 (26.1)	.155 (3.97)	#6
16	1.118 (28.4)	.969 (24.6)	.125 (3.1)	#4	1.125 (28.5)	.155 (3.97)	#6
18	1.240 (31.5)	1.062 (26.9)	.125 (3.1)	#4	1.203 (30.5)	.155 (3.97)	#6
20	1.366 (34.7)	1.156 (29.3)	.125 (3.1)	#4	1.297 (32.9)	.155 (3.97)	#6
22	1.490 (37.8)	1.250 (31.7)	.125 (3.1)	#4	1.375 (34.9)	.155 (3.97)	#6
24	1.616 (41.0)	1.375 (34.9)	.155 (3.9)	#6	1.500 (38.1)	.155 (3.97)	#6

→ See page 143 for MS3470/MB10 gaskets.
 → See page 490 for nut plates and seal screws.

JAM NUT PANEL CUTOUTS

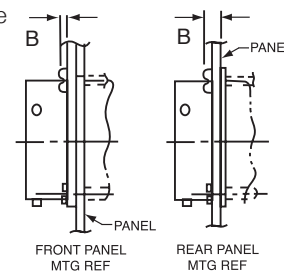
MS3474 (MB14)



SHELL SIZE	A DIAMETER ±.005 (±0.13)	B ±.005 (±0.13)
8	.572 (15.5)	.536 (13.6)
10	.697 (17.7)	.661 (16.7)
12	.895 (22.7)	.824 (20.9)
14	1.010 (25.6)	.948 (24.0)
16	1.135 (28.3)	1.072 (27.2)
18	1.260 (32.0)	1.197 (30.4)
20	1.385 (35.1)	1.322 (33.5)
22	1.510 (38.3)	1.447 (36.7)
24	1.635 (41.5)	1.572 (39.9)

PANEL THICKNESS

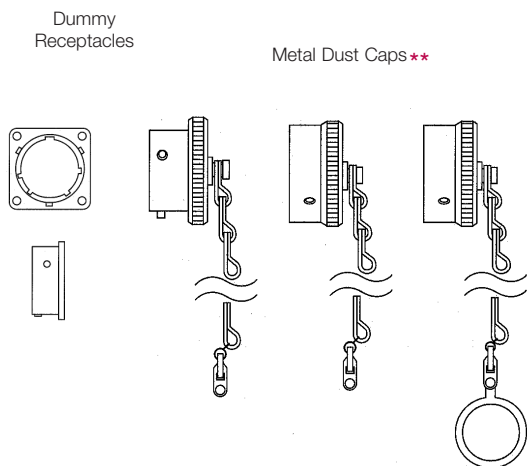
MS3470 (MB10) Narrow Flange
 MS3472 (MB11) Wide Flange



SHELL SIZE	NARROW FLANGE MS3470/MB10	WIDE FLANGE MS3472/MB11
	*B MAX	
8		
10	.087	.118
12	(2.2)	(3.0)
14		
16		
18		
20		
22	.212	.212
24	(5.3)	(5.3)

* (Screw head front-mount or panel thickness plus screw head rear-mount)

DUMMY RECEPTACLES & METAL DUST CAPS

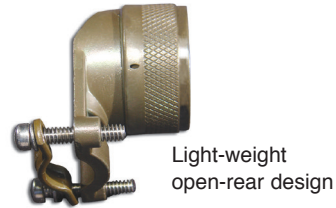


SHELL SIZE CHAIN	DUMMY RECEPTACLE	FOR PLUG	METAL DUST CAPS	
			FOR RECEPTACLE	
			FLANGED** WITH SASH CHAIN PART NUMBER	JAM NUT** WITH SASH AND RING
8	MS3115-8	MS3180-8CA	MS3181-8CA	MS3181-8NA
10	MS3115-10	MS3180-10CA	MS3181-10CA	MS3181-10NA
12	MS3115-12	MS3180-12CA	MS3181-12CA	MS3181-12NA
14	MS3115-14	MS3180-14CA	MS3181-14CA	MS3181-14NA
16	MS3115-16	MS3180-16CA	MS3181-16CA	MS3181-16NA
18	MS3115-18	MS3180-18CA	MS3181-18CA	MS3181-18NA
20	MS3115-20	MS3180-20CA	MS3181-20CA	MS3181-20NA
22	MS3115-22	MS3180-22CA	MS3181-22CA	MS3181-22NA
24	MS3115-24	MS3180-24CA	MS3181-24CA	MS3181-24NA

** Sash chain for mounting screw on flanged receptacles.
 Sash chain with ring for mounting to jam nut receptacle.
 Dust caps are anodized-plated.

All dimensions in inches (millimeters in parenthesis)

STANDARD CABLE CLAMPS



SHELL SIZE	STRAIGHT CLAMP		90°		CABLE ENTRY	
	LOW COST	SELF-LOCKING	LOW COST	SELF-LOCKING	MAX	MIN
8	M85049/52-1-8*	M85049/52S8*	M85049/51-1-8*	M85049/51S8*	.204 (5.18)	.125 (3.18)
10	M85049/52-1-10*	M85049/52S10*	M85049/51-1-10*	M85049/51S10*	.286 (7.26)	.187 (4.75)
12	M85049/52-1-12*	M85049/52S12*	M85049/51-1-12*	M85049/51S12*	.416 (10.57)	.291 (7.39)
14	M85049/52-1-14*	M85049/52S14*	M85049/51-1-14*	M85049/51S14*	.476 (12.09)	.351 (8.92)
16	M85049/52-1-16*	M85049/52S16*	M85049/51-1-16*	M85049/51S16*	.625 (15.88)	.501 (12.72)
18	M85049/52-1-18*	M85049/52S18*	M85049/51-1-18*	M85049/51S18*	.706 (17.93)	.518 (13.16)
20	M85049/52-1-20*	M85049/52S20*	M85049/51-1-20*	M85049/51S20*	.831 (21.11)	.581 (14.76)
22	M85049/52-1-22*	M85049/52S22*	M85049/51-1-22*	M85049/51S22*	.956 (24.28)	.644 (16.36)
24	M85049/52-1-24*	M85049/52S24*	M85049/51-1-24*	M85049/51S24*	1.081 (27.46)	.706 (17.93)

* Select plating code to match connector plating
 N = Electroless nickel
 W = Olive drab chromate over cadmium over electroless nickel (500-hour salt spray)

	DESCRIPTION	PART NUMBER PREFIX	STRAIGHT	90°	45°
	Heat Shrink Boot Adapter ↔ See pages 491-492	M85049/60	X		
	Environmental	M85049/7		X	X
		M85049/9		X	
		M85049/11	X		
	EMI/RFI Non-Environmental	M85049/23			X
		M85049/24		X	
		M85049/25	X		
	EMI/RFI Environmental	M85049/6			X
		M85049/8		X	
		M85049/10	X		
	EMI/RFI Crimp Ring	M85049/26	X		
	EMI/RFI Banding	M85049/82	X		
		M85049/83			X
		M85049/84		X	
	Cable Tie	M85049/55		X	
		M85049/53	X		
		M85049/54			X
	Wire Seal	M85049/31	X		
	Compression Nuts "E"				

NOTE: If military-standard versions won't work for your applications, please contact us with your requirements.

All dimensions in inches (millimeters in parenthesis)

ASSEMBLY INSTRUCTIONS

WIRE STRIPPING AND CONTACT CRIMPING

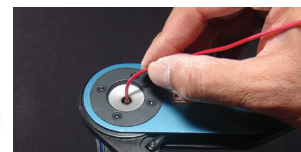


STEP 1: Strip wires. See above for correct strip length for contact. Insert wire into rear of contact. Wire insulation must push against rear of contact. Wire must be visible through inspection hole.



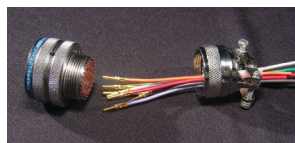
STEP 2: Use M22520/1-01 crimp tool with proper crimp locator M22520/1-02. → See pages 176-177 for additional tooling.

CONTACT SIZE	COLOR
20	Red
16	Blue
12	Yellow

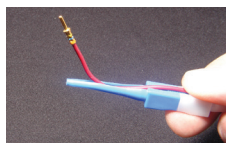


STEP 3: Insert contact and wire into tool jaws. To crimp, squeeze handles together fully until ratchet releases and allows handles to expand; otherwise, contact cannot be extracted from tool jaws. Maintain slight insertion pressure on wire while crimping contact to wire.*

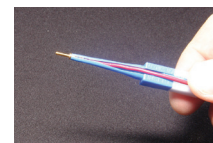
CONTACT INSERTION



STEP 1: Remove backshell and put wired contacts through cable clamp opening.



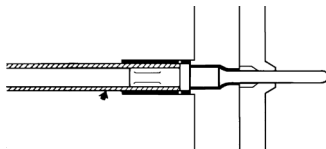
STEP 2: Use colored end of CIET tool for insertion. Place wire into tool at large opening. To facilitate contact insertion, a minimum six inches of free wire is recommended.



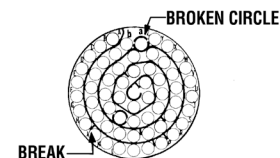
STEP 3: Slide tool on wire while holding thumb against wire at opening. Wire will slip into tool.



STEP 4: With tool pressed against shoulder of contact, starting at the center cavity, insert wired contact and tool into properly-identified cavity at rear of plug with firm, even pressure. Do not use excessive pressure.



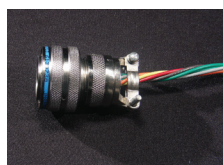
STEP 5: When contact bottoms, a slight click can be heard as tines of metal retaining clip snap into place behind contact shoulder.



STEP 6: Check face of plug or receptacle for proper contact installation. In socket inserts with a large number of contacts, cavities are identified in a spiral pattern. A projecting line from the spiral indicates omission of a letter; a broken circle around a cavity indicates transition between capitals, lower case and double letters.



STEP 7: Withdraw tool from rear of plug. To be sure that contact is locked, pull back lightly on wire. Then remove tool from wire and proceed with other contacts.



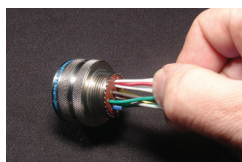
STEP 8: After all contacts are inserted, fill unwired cavities with sealing plugs (insert head first and leave end protruding for ease of removal), assemble backshell on rear of connector.



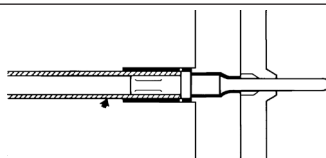
SEE PAGE 146 for endbell tightening tools.

* **IMPORTANT NOTE:** Microsection the contact to verify crimp quality.

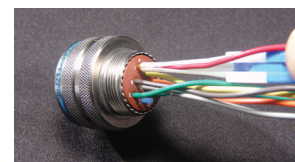
CONTACT EXTRACTION



STEP 1: Remove backshell and slide along wires to allow access. To extract a contact, use white end of CIET tool. Place wire into tool at large opening. Slide back tool on wire while holding thumb against wire at opening. Wire will slip into tool.



STEP 2: Push tool into rear of plug until it bottoms. At this point, tool releases tines on retaining clip so that contact can be extracted.



STEP 3: While maintaining slight insertion force on tool, firmly hold wire against serrated shoulder at center of tool and extract both wired contact and tool from plug.

NOTE: LJT series shown.