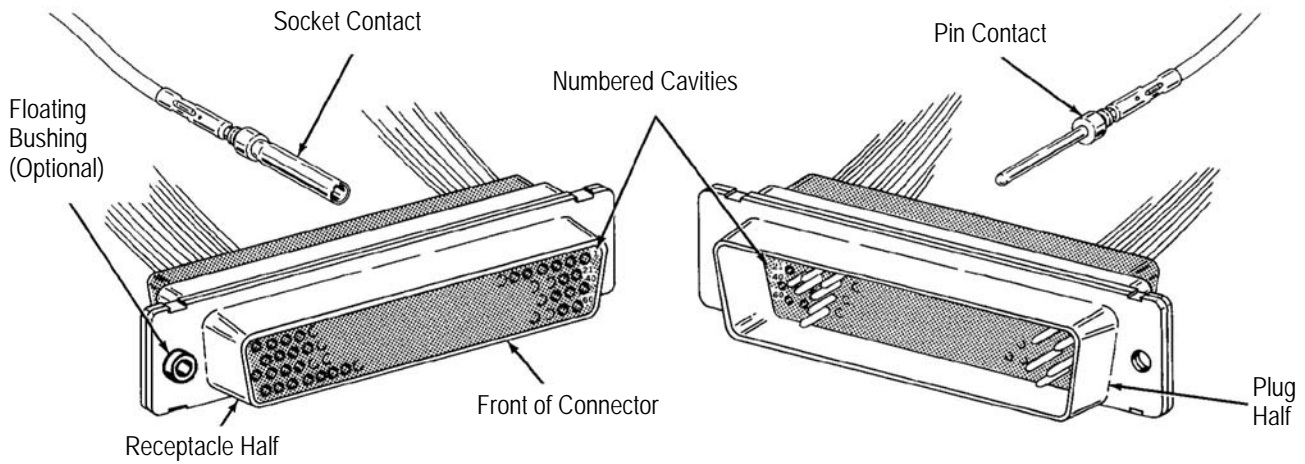




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2201864-3





| CONN POS 15-44 | TYPE OF CONN | W/O BUSHINGS | | WITH BUSHINGS | | CONN POS 62-104 | TYPE OF CONN | W/O BUSHINGS | | WITH BUSHINGS | |
|----------------|--------------|--------------|-----------|---------------|-----------|-----------------|--------------|--------------|-----------|---------------|-----------|
| | | TE P/N † | MIL P/N ‡ | TE P/N † | MIL P/N ‡ | | | TE P/N † | MIL P/N ‡ | TE P/N † | MIL P/N ‡ |
| 15 | Rcpt | 204500-1 | 2-286 | 204524-1 | 2-297 | 62 | Rcpt | 204506-1 | 2-289 | 204530-1 | 2-300 |
| | | 204512-2 | 2-11 | 204536-2 | 2-28 | | | 204518-2 | 2-14 | 204542-2 | 2-31 |
| | | 204512-3 | 2-17 | --- | --- | | | 204518-3 | 2-20 | --- | --- |
| | Plug | 204501-1 | 4-264 | 204525-1 | --- | | Plug | 204507-1 | 4-267 | 204531-1 | --- |
| | | 204513-2 | 4-11 | 204537-2 | --- | | | 204519-2 | 4-14 | 204543-2 | --- |
| | | 204513-3 | 4-17 | --- | --- | | | 204519-3 | 4-20 | --- | --- |
| 26 | Rcpt | 204502-1 | 2-287 | 204526-1 | 2-298 | 78 | Rcpt | 204508-1 | 2-290 | 204532-1 | 2-301 |
| | | 204514-2 | 2-12 | 204538-2 | 2-29 | | | 204520-2 | 2-15 | 204544-2 | 2-32 |
| | | 204514-3 | 2-18 | --- | --- | | | 204520-3 | 2-21 | --- | --- |
| | Plug | 204503-1 | 4-265 | 204527-1 | --- | | Plug | 204509-1 | 4-268 | 204533-1 | --- |
| | | 204503-2 | 4-12 | 204539-2 | --- | | | 204521-2 | 4-15 | 204545-2 | --- |
| | | 204515-3 | 4-18 | --- | --- | | | 204521-3 | 4-21 | --- | --- |
| 44 | Rcpt | 204504-1 | 2-288 | 204528-1 | 2-299 | 104 | Rcpt | 204510-1 | 2-291 | 204534-1 | 2-302 |
| | | 204516-2 | 2-13 | 204540-2 | 2-30 | | | 204522-2 | 2-16 | 204546-2 | 2-33 |
| | | 204516-3 | 2-19 | --- | --- | | | 204522-3 | 2-22 | --- | --- |
| | Plug | 204505-1 | 4-266 | 204529-1 | --- | | Plug | 204511-1 | 4-269 | 204535-1 | --- |
| | | 204517-2 | 4-13 | 204541-2 | --- | | | 204523-2 | 4-16 | 204547-2 | --- |
| | | 204517-3 | 4-19 | --- | --- | | | 204523-3 | 4-22 | --- | --- |

† These part numbers include the various assemblies that are available. Ex: 15 position without bushings: 204500-1 = receptacle only; 204512-2 = receptacle with sockets; 204512-3 = receptacle with insertion/extraction tool and sockets.

‡ Suffix to M24308. Ex: 15 position receptacle only, without bushings. M24308/2-286

Figure 1

1. INTRODUCTION

This instruction sheet covers the AMPLIMITE High Density 22 (HD-22) Series 90 Connectors, applicable contacts, and assembly procedures.

Read these instructions, and those referenced for specific applications, before starting.



All dimensions are in metric units [with U.S. customary dimensions in brackets]. Figures and illustrations are for reference only and are not drawn to scale.

Reason for revision is given in Section 6, REVISION SUMMARY.

2. DESCRIPTION

These connectors have been designed in accordance with military specification MIL-C-24308. They have cadmium plated steel shells which feature a keystone design for polarization. Each shell houses a one-piece thermoplastic insert containing metal contact retention springs. Refer to the table in Figure 1 for the various connector assemblies that are available with or without floating bushings.

The connectors are designed for REAR insertion and extraction of size 22 screw machine contacts. The contact cavities are identified on the FRONT and BACK to provide circuit identification.

3. CRIMPING PROCEDURES

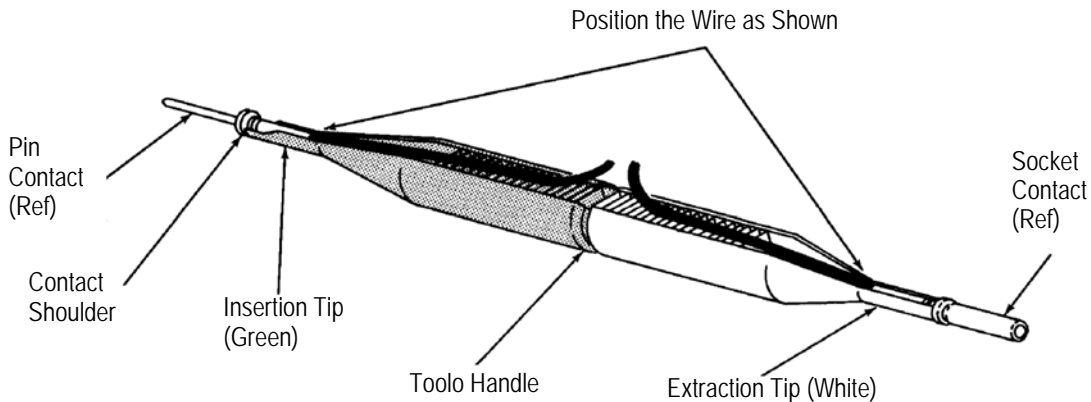
Refer to the table in Figure 2, and then select the wire (stranded only) of the specified size and insulation diameter. Strip the wire to the length indicated. Do NOT cut or nick the wire strands.

3.1. Hand Tool Application

The hand tool M22520/2-01, with applicable positioner, is recommended for crimping the loose piece contacts listed in the table in Figure 2. Note that the positioner is determined by the type of contact, and the selector setting is determined by the wire size being used. Refer to Instruction Sheet 408-7516 for addresses of the various tool manufacturers and a complete listing of tools, positioners, and turret heads for TE screw machine contacts.

3.2. Auto-Machine Applications

The AMP-TAPETRONIC Stripper/Crimper Machine 599406-7 is recommended for crimping the tape-mounted contacts listed in the table in Figure 2. Refer to Customer Manual 409-5253 packaged with the machine for the proper crimping procedures.



| WIRE SIZE, AWG | INSUL DIA | WIRE STRIP LENGTH | CONTACT NUMBER | | HAND TOOL M22520/2-01 | | | POWER UNIT† | INSERTION/EXTRACTION TOOL |
|----------------|------------------------|-------------------|------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------|---------------|----------|-------------|---------------------------|
| | | | LOOSE PIECE | TAPE MOUNTED | POSITIONER | WIRE SIZE AWG | SEL POSN | | |
| 28-22 | 1.37 [.054] Max. | 3.96 [.156] | SOCKET 204351-1 M39029/ 57-354 PIN 204370-2 M39029/ 58-360 | SOCKET 204351-2 PIN 204370-5 | SOCKET M22520/2-06 PIN M22520/2-09 | 28 | 1 | 599406-7 | 91067-1 M81969/1-04 |
| | | | | | | 26 | 2 | | |
| | | | | | | 24 | 3 | | |
| | | | | | | 22 | 4 | | |

† AMP-TAPETRONIC* Machine

Figure 2

4. INSERTION AND EXTRACTION PROCEDURES

Pin contacts must be inserted into the plug half and mating socket contacts must be inserted into the receptacle half of the connector. Notice that each row of cavities is numbered. Make certain the cavities of

the receptacle half are mirror image of the plug half before inserting the contacts. If all cavities are not used, the contacts should be distributed evenly throughout the connector.

The Insertion/Extraction Tool 91067-1 is recommended for inserting and extracting both pin and socket contacts. Refer to Instruction Sheet 408-7508 packaged with the tool for the specific procedures.

General Procedures:

4.1. Insertion

1. Position the wire of the contact in the green tip. Make certain the tool tip butts against the shoulder of the contact as shown in Figure 2.
2. Align the contact with the connector cavity and push it straight in until it bottoms in the cavity.
3. Remove the tool and pull back lightly on the wire to make sure the contact is locked in the cavity.

4.2. Extraction

1. Position the wire of the contact in the white tip as indicated in Figure 2.
2. Align the tool tip with the connector cavity and push it straight in until it bottoms in the cavity.

3. Press the wire against the tool handle and pull back to extract the contact. The contact will come out easily.

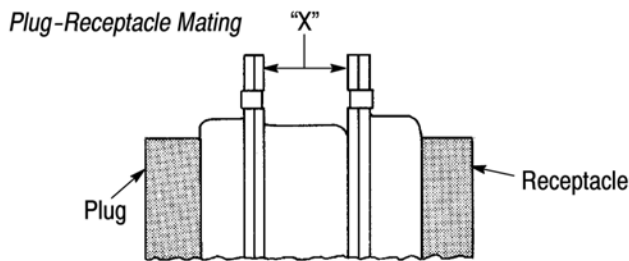
5. PANEL CUTOUT

These connectors are designed for rack and panel applications. TE recommends that you mount the plug half to the panel and install the receptacle half in the rack. Notice the clearance required to ensure fully mated connector halves. Refer to Figure 3.

Before making the panel cutout, determine the number of positions in the connector and whether the connector has floating bushings. Then, using the clearance dimensions provided in Figure 3, determine whether you are going to FRONT or BACK mount the connector. Now, make a cutout in the panel using the dimensions shown in the table in Figure 3. When mounting the connector to the FRONT of the panel, Tyco Electronics recommends that you remove the material indicated by the dotted lines in Figure 3.

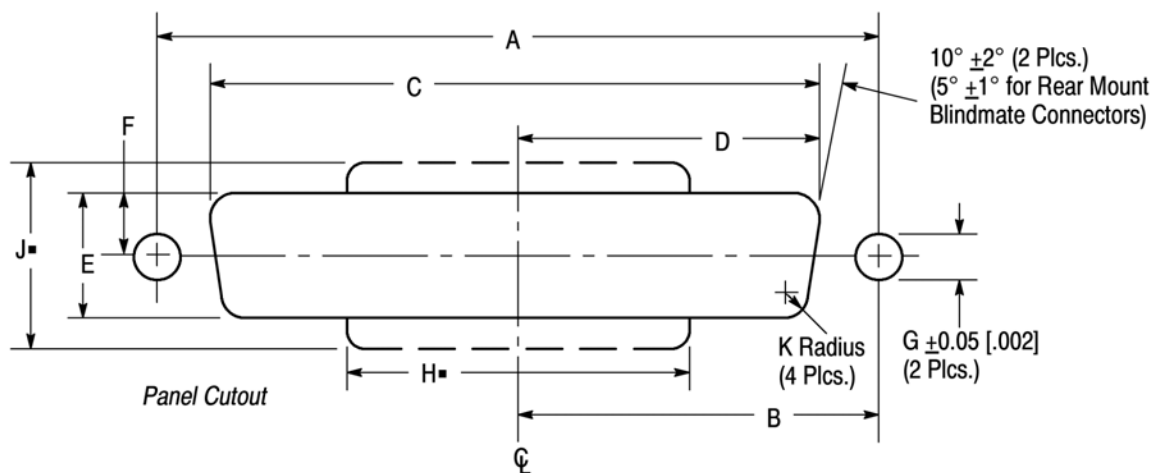
6. REVISION SUMMARY

Since the previous release of this document, the new company logo has been applied.



| SHELL SIZE | DIMENSION "X" |
|------------|-----------------------|
| 1, 2 | 6.35-7.11 [.250-.280] |
| 3, 4, 5, 6 | 6.12-6.88 [.241-.271] |

NOTE: The "X" dimension is necessary for full mating of connector halves. This dimension must be taken into consideration when determining the method of mounting, panel thickness, etc.



▪Panel cutout configuration with these dimensions provides clearance for mounting connectors with cable clamp assemblies.

NOTE: When front mounting a MIL-DTL-24308 connector utilizing the tab method of securing shell halves, it is recommended to utilize a 0.81 [.032] thick washer (not supplied) to prevent deformation of the connector flange.

Figure 3 (Cont'd)

| SHELL SIZE (CONTACT POSITIONS) | MOUNTING METHOD | | DIMENSIONS | | | | | | | | | |
|--------------------------------------|---------------------------|----------------------------------------|------------------|------------------|------------------|------------------|-----------------|----------------|----------------|------------------|-----------------|----------------|
| | FRONT OR REAR PANEL | WITH OR WITHOUT FLOATING BUSHING | A | B | C | D | E | F | G | H* | J* | K |
| 1 (15) | FRONT | WITH | 24.99 [.984] | 12.5 [.492] | 23.01 [.906] | 11.51 [.453] | 13.84 [.545] | 6.93 [.273] | 2.24 [.088] | --- | --- | 2.11 [.083] |
| | | WITHOUT | | | 22.2 [.874] | 11.1 [.437] | 13.03 [.513] | 6.53 [.257] | 3.05 [.120] | --- | --- | |
| | REAR | WITH | | | 21.29 [.838] | 10.64 [.419] | 12.22 [.481] | 6.12 [.241] | 2.24 [.088] | 8.43 [.332] | 16.81 [.662] | 3.35 [.132] |
| | | WITHOUT | | | 20.47 [.806] | 10.24 [.403] | 11.4 [.449] | 5.72 [.225] | 3.05 [.120] | 7.62 [.300] | 16 [.630] | |
| 2 (26) | FRONT | WITH | 33.32 [1.312] | 16.66 [.656] | 31.34 [1.234] | 15.67 [.617] | 13.84 [.545] | 6.93 [.273] | 2.24 [.088] | --- | --- | 2.11 [.083] |
| | | WITHOUT | | | 30.53 [1.202] | 15.27 [.601] | 13.03 [.513] | 6.53 [.257] | 3.05 [.120] | --- | --- | |
| | REAR | WITH | | | 29.62 [1.166] | 14.81 [.583] | 12.22 [.481] | 6.12 [.241] | 2.24 [.088] | 6.64 [.665] | 16.81 [.662] | 3.35 [.132] |
| | | WITHOUT | | | 28.8 [1.134] | 14.4 [.567] | 11.4 [.449] | 5.72 [.225] | 3.05 [.120] | 15.82 [.623] | 16 [.630] | |
| 3 (44) | FRONT | WITH | 47.04 [1.852] | 23.52 [.926] | 45.09 [1.775] | 22.55 [.888] | 13.84 [.545] | 6.93 [.273] | 2.24 [.088] | --- | --- | 2.11 [.083] |
| | | WITHOUT | | | 44.27 [1.743] | 22.15 [.872] | 13.03 [.513] | 6.53 [.257] | 3.05 [.120] | --- | --- | |
| | REAR | WITH | | | 43.33 [1.706] | 21.67 [.853] | 12.22 [.481] | 6.12 [.241] | 2.24 [.088] | 30.04 [1.197] | 16.81 [.662] | 3.35 [.132] |
| | | WITHOUT | | | 42.52 [1.674] | 21.26 [.837] | 11.4 [.449] | 5.72 [.225] | 3.05 [.120] | 29.59 [1.165] | 16 [.630] | |
| 4 (62) | FRONT | WITH | 63.5 [2.500] | 31.75 [1.250] | 61.17 [2.423] | 30.78 [1.212] | 13.84 [.545] | 6.93 [.273] | 2.24 [.088] | --- | --- | 2.11 [.083] |
| | | WITHOUT | | | 60.73 [2.391] | 30.38 [1.196] | 13.03 [.513] | 6.53 [.257] | 3.05 [.120] | --- | --- | |
| | REAR | WITH | | | 59.79 [2.354] | 29.9 [1.777] | 12.22 [.481] | 6.12 [.241] | 2.24 [.088] | 46.86 [1.845] | 16.81 [.662] | 3.35 [.132] |
| | | WITHOUT | | | 59.08 [2.326] | 29.54 [1.163] | 11.4 [.449] | 5.72 [.225] | 3.05 [.120] | 46.05 [1.813] | 16 [.630] | |
| 5 (78) | FRONT | WITH | 61.11 [2.406] | 30.56 [1.203] | 59.16 [2.329] | 29.59 [1.165] | 16.64 [.655] | 8.33 [.328] | 2.24 [.088] | --- | --- | 2.11 [.083] |
| | | WITHOUT | | | 58.34 [2.297] | 29.18 [1.149] | 15.82 [.623] | 7.92 [.312] | 3.05 [.120] | --- | --- | |
| | REAR | WITH | | | 57.15 [2.250] | 28.58 [1.125] | 14.91 [.587] | 7.47 [.294] | 2.24 [.088] | 44.2 [1.740] | 19.61 [.772] | 3.35 [.132] |
| | | WITHOUT | | | 56.34 [2.218] | 28.17 [1.109] | 14.1 [.555] | 7.06 [.278] | 3.05 [.120] | 43.38 [1.708] | 18.8 [.740] | |
| 6 (104) | FRONT | WITH | 63.5 [2.500] | 31.75 [1.250] | 62.31 [2.453] | 31.17 [1.227] | 18.21 [.717] | 9.12 [.359] | 2.24 [.088] | --- | --- | 2.11 [.083] |
| | | WITHOUT | | | 61.49 [2.421] | 30.76 [1.211] | 17.4 [.685] | 8.71 [.343] | 3.05 [.120] | --- | --- | |
| | REAR | WITH | | | 60.66 [2.388] | 30.33 [1.194] | 16.61 [.654] | 8.31 [.327] | 2.24 [.088] | 47.64 [1.875] | 21.21 [.835] | 3.35 [.132] |
| | | WITHOUT | | | 59.84 [2.356] | 29.92 [1.179] | 5.8 [.622] | 7.9 [.311] | 3.05 [.120] | 46.81 [1.843] | 20.4 [.803] | |

Figure 3 (End)

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