1 YEAR
WARRANTY

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User's Guide

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MTC Series
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SECTION 1 INTRODUCTION

1.1 General Description

The OMEGA™ Multi-Pin Thermocouple Connectors provide a sturdy and efficient means of joining multi-wire thermocouple cables. They can be used with OMEGA™ Multipair Extension Cable for rapid, convenient connection and dismantling of apparatus without handling individual sensors.

The design utilizes a combination of resilient and rigid dielectric insulators to eliminate internal air voids and prevent the passage of air and moisture into or through the connector. Connectors can withstand ambient temperatures up to 392°F (200°C) contributing to an extended connector life.

The OMEGA Multi-Pin Thermocouple Connectors do not carry a MIL spec. number; however, they do meet the performance requirements of MIL-C 26500E and are intermateable with MIL-C 26500 connectors.

1.2 Features

- Thermocouple alloy pins and sockets
- Air and moisture resistant connection
- Rated to 392°F (200°C)
- Removable crimp contacts
- Accepts 20-24 gage wire
- Aluminum shells
- Black anodized finish
- Threaded coupling

SECTION 2 UNPACKING

Remove the Packing List and verify that all equipment has been received. If there are any questions about the shipment, please call OMEGA™ Customer Service Department.

Upon receipt of shipment, inspect the container and equipment for any signs of damage. Take particular note of any evidence of rough handling in transit. Immediately report any damage to the shipping agent.

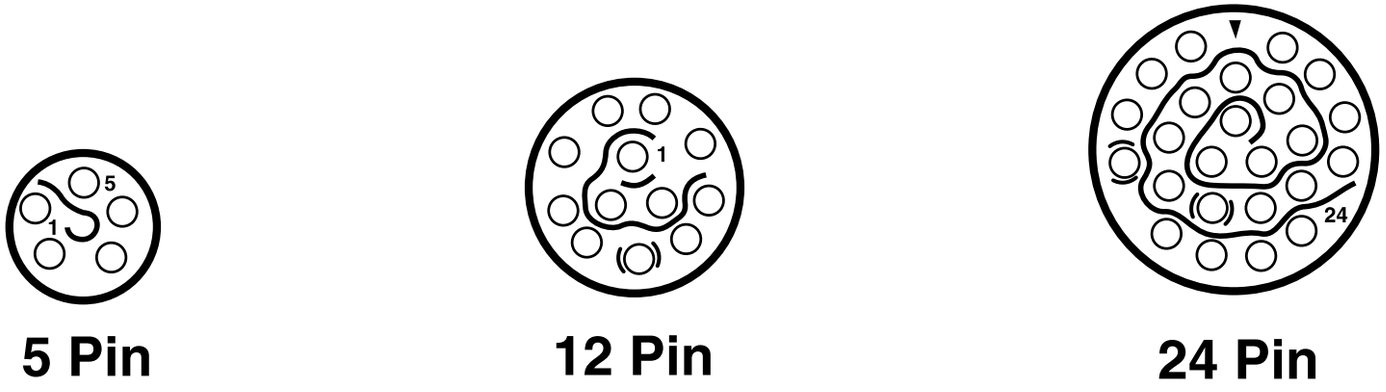
NOTE

The carrier will not honor any claims unless all ship ing material is saved far their examination. After examining and removing contents, save packing material and carton in the event reshipment is necessary

SECTION 3 OPERATION

3.1 Multi-Pin Connector Bodies

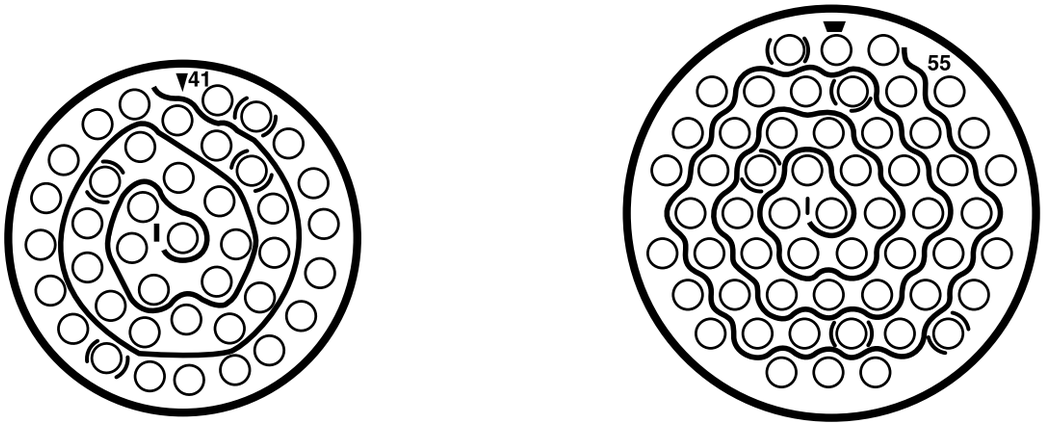
The contact cavities in the connectors are identified with a spiral guide line indicating cavity sequence (see Figure 3-1). The first and last cavities are numbered and every tenth cavity is bracketed. The number of available cavities are 5, 12, 24, 41, and 55.



5 Pin

12 Pin

24 Pin



41 Pin

55 Pin

Figure 3-1. Cavity Sequence

The multi-pin connector bodies come in three styles (plus backshell cable clamps), MC-male cord, FC-female cord, and FF-female flanged.

A. MC-Male Cord (see Figure 3-2)
   In-line cord connectors with threaded couplings. MC style uses thermocouple alloy pins.

B. Style FC-Female Cord (see Figure 3-3)
   In-line cord connectors with threaded couplings. FC style uses thermocouple alloy sockets.

C. Style FF-Female Flanged (see Figure 3-4)
   Rugged flanged body for bulkhead and chassis mounting. It is a flange mounted receptacle with threaded coupling. FF style uses thermocouple alloy sockets.

D. Backshell Cable Clamp
   Backshell cable clamps provide effective support for the cable at the male or female connector and prevent twisting and pulling.

3.2 Thermocouple Contacts

The thermocouple contacts must be installed into the multi-pin connector bodies by the user. Styles FC and FF use the thermocouple alloy sockets; Style MC uses the thermocouple alloy pins. Pins and sockets must be matched to thermocouple alloys.

The push-in crimp style contacts are machined from thermocouple alloy materials and color coded for easy identification. Gold plated copper (uncompensated) pins and sockets are available for use

Connector Body	Shell Size	Number of Cavities	"M" Backshell Clamp Thread	"S" Coupling Nut Dia.	"T" Shell Skirt Dia.	"V" Shell Internal Dia.
MTC-5-MC	10	5	9/16-24 UNEF	0.906	0.526	0.444
MTC-12-MC	12	12	3/4-20 UNEF	1.078	0.696	0.614
MTC-24-MC	16	24	15/16-20 UNEF	1.266	0.892	0.810
MTC-41-MC	20	41	1 3/16-18 UNEF	1.510	1.123	1.041
MTC-55-MC	22	55	1 5/16-18 UNEF	1.625	1.248	1.166

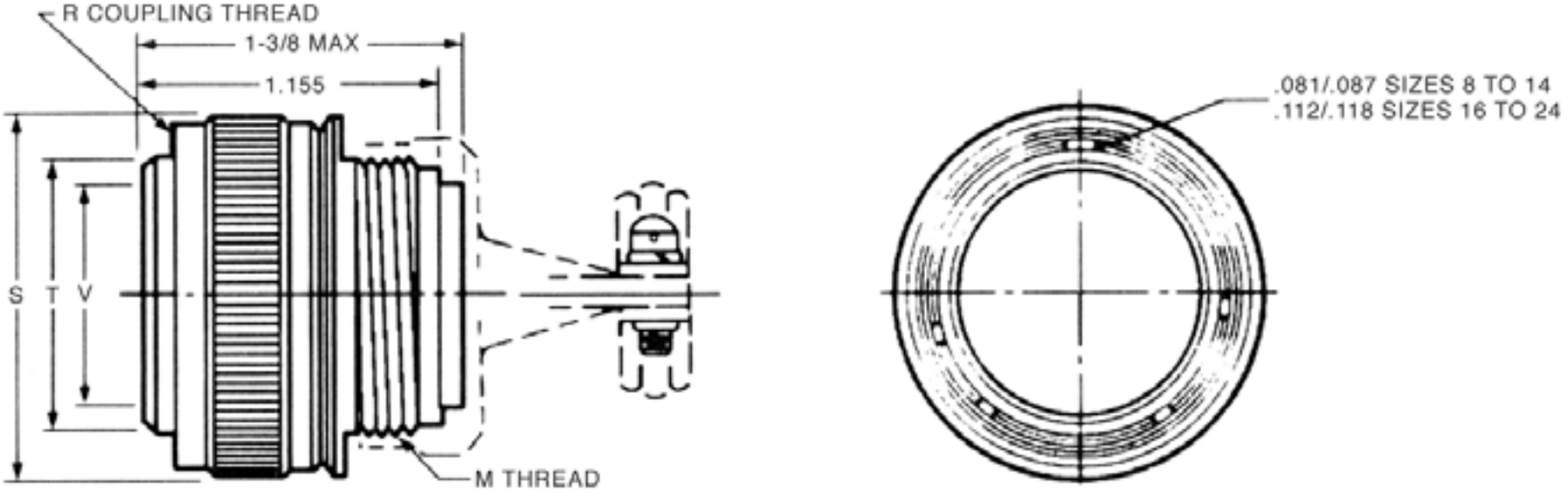


Figure 3-2. MC Style Connector

Connector Body	Shell Size	Number of Cavities	"M" Backshell Clamp Thread	"R" Coupling Thread	"S" Flange Width	"T" Locknut Flats	"Y" Mounting Hole Dia.	"Z" Mounting Hole Flat
MTC-5-FC	10	5	9/16-24 UNEF	11/16-24	1.104	15/16	0.760	0.730
MTC-12-FC	12	12	3/4-20 UNEF	7/8-24	1.291	1 1/8	0.947	0.917
MTC-24-FC	16	24	15/16-20 UNEF	1 1/16-18	1.516	1 5/16	1.135	1.105
MTC-41-FC	20	41	1 3/16-18 UNEF	1 5/16-18	1.860	1 9/16	1.385	1.350
MTC-55-FC	22	55	1 5/16-18 UNEF	1 7/16-18	1.954	1 11/16	1.510	1.475

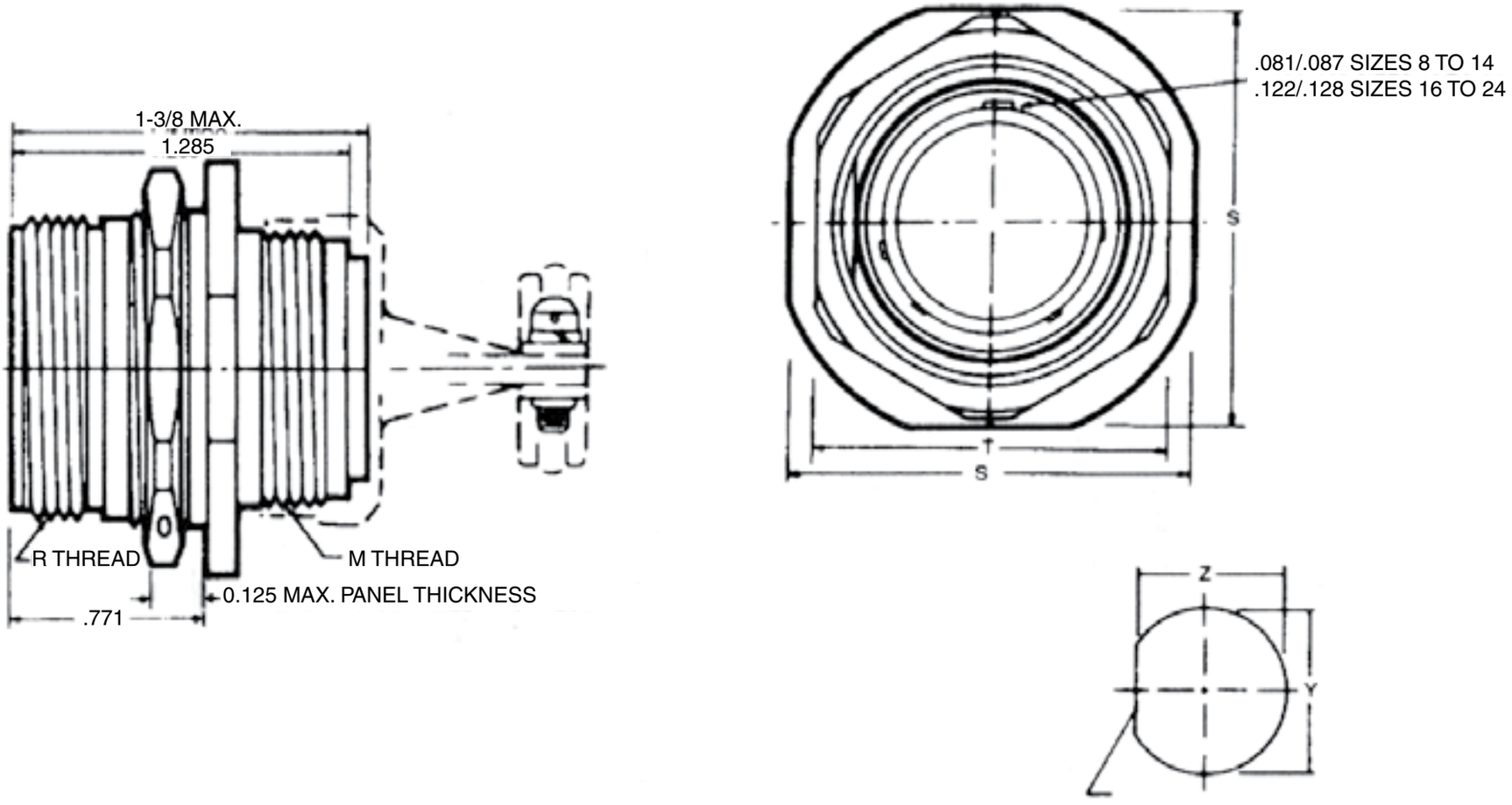


Figure 3-3. FC Style Connector

Connector Body	Shell Size	Number of Cavities	"M" Backshell Clamp Thread	"R" Coupling Thread	"S" Flange Width	"T" Mounting Hole Centers	"Y" Back Mounting Hole	"Z" Front Mounting Hole
MTC-5-FC	10	5	9/16-24 UNEF	11/16-24	.937	0.719	0.748	0.572
MTC-12-FC	12	12	3/4-20 UNEF	7/8-24	1.031	0.812	0.913	0.760
MTC-24-FC	16	24	15/16-20 UNEF	1 1/16-18	1.250	0.969	1.107	0.948
MTC-41-FC	20	41	1 3/16-18 UNEF	1 5/16-18	1.437	1.156	1.325	1.197
MTC-55-FF	22	55	1 5/16-18 UNEF	1 7/16	1.562	1.250	1.452	1.322

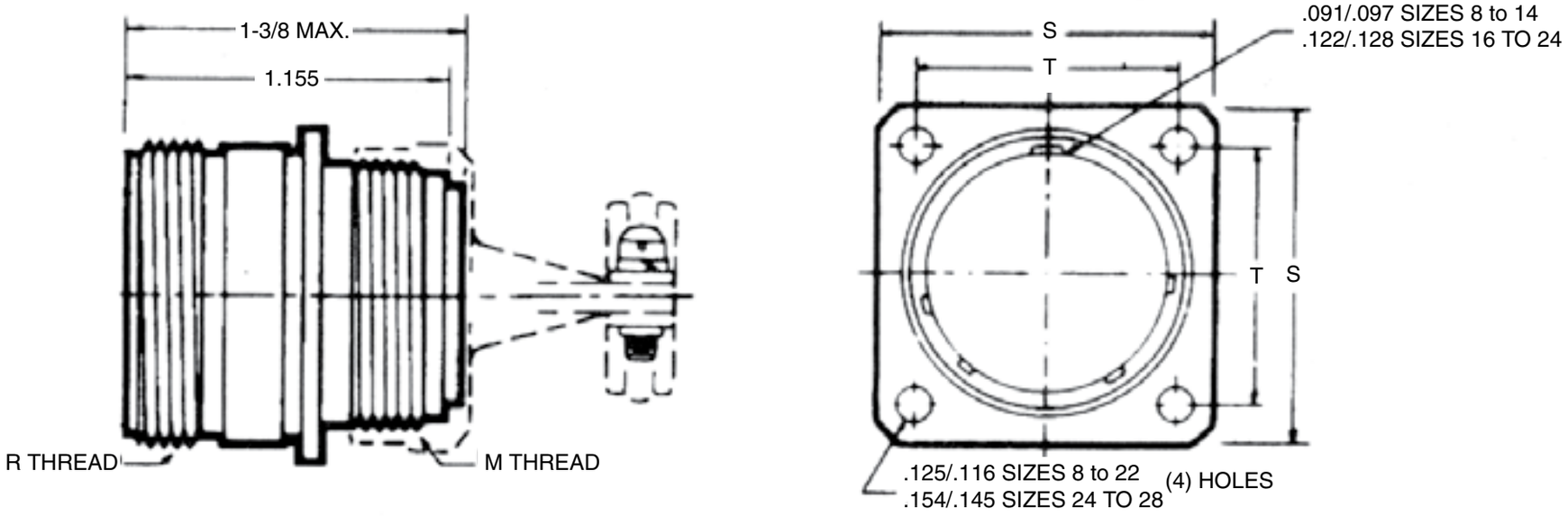


Figure 3-4. FF Style Connector

3.3 Backshell Clamps

(See Figure 3-5, Page 9).

3.4 Installing The Thermocouple Contacts

3.4.1 Contact Termination

Contacts are crimp terminated onto the wire outside the connector assembly. A specially designed MS standard crimping tool (OMEGA™ MTC-CT) must be used to properly crimp wires to the pins or sockets.

1. Strip the wire (20 to 24 gage) .170″ to .201″; avoid nicking the wires or damaging the insulation as it is a functional part of the sealing system.
2. Insert the stripped wire into the contact pocket until it is visible through the inspection hole (see Figure 3-6).
3. Fully seat contact in crimp tool positioner.
4. Crimp in one full stroke. (Ratchet action ensures a complete crimp every time.)
5. Inspect crimp for wire visibility through inspection hole.

Backshelf Clamp	Max Dia. B	Length	Max Dia. D	Dia. E
MTC-5-SHL	3/4	2	1	3/8
MTC-12-SHL	1	2	1 1/8	1/2
MTC-24-SHL	1 1/8	2 1/2	1 1/2	5/8
MTC-41-SHL	1 3/8	2 1/2	1 1/2	5/8
MTC-55-SHL	1 1/2	3	1 5/8	7/8
MTC-5-SHL-A	3/4	2	3/4	1/8
MTC-12-SHL-A	1	2	7/8	3/16
MTC-24-SHL-A	1 1/8	2 1/2	1	5/16
MTC-41-SHL-A	1 3/8	2 1/2	1 1/8	7/16
MTC-55-SHL-A	1 1/2	3	1 1/8	1/2

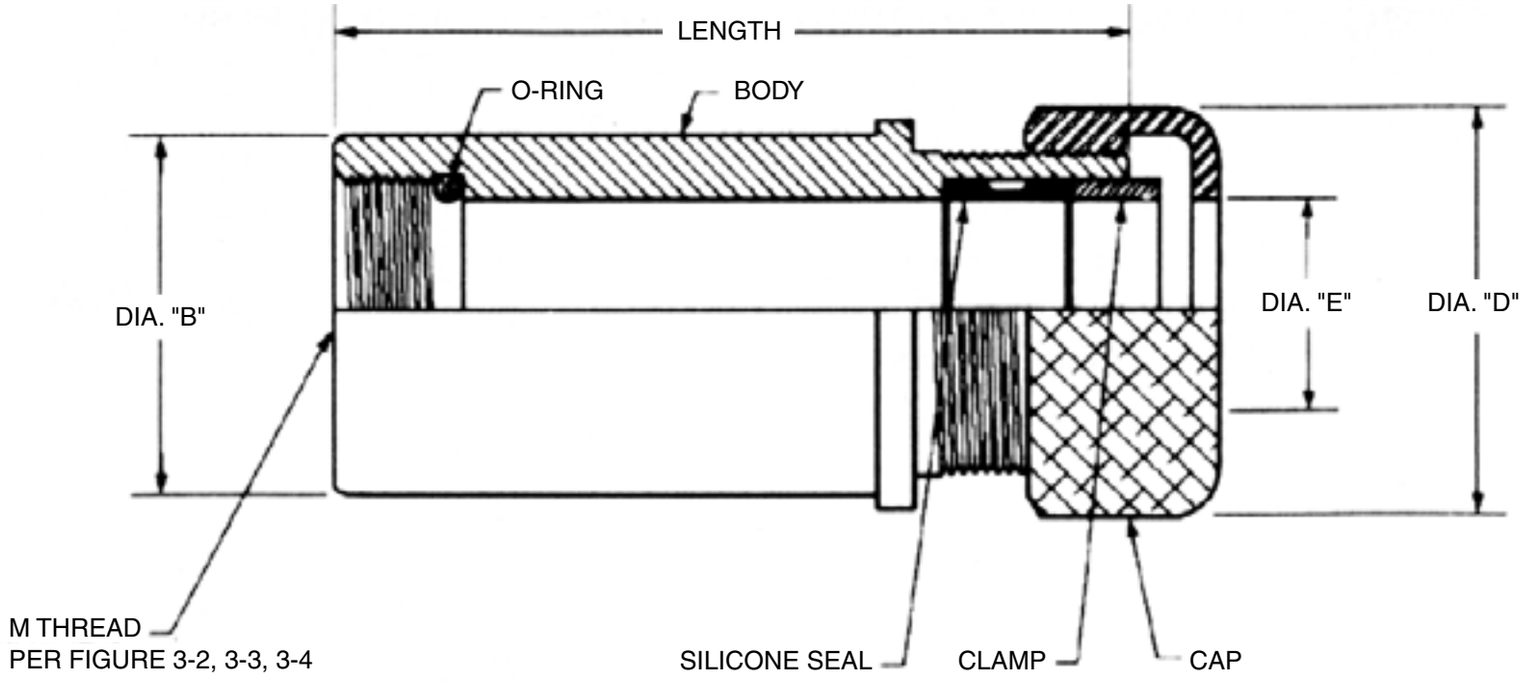


Figure 3-5. Backshell Clamps

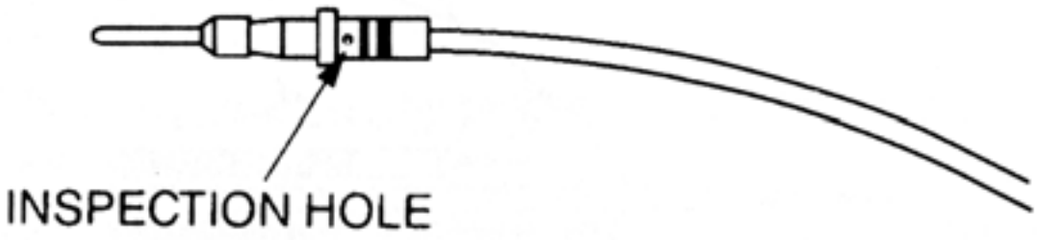


Figure 3-6. Inserting the Stripped Wire into the Contact

3.4.2 Contact Insertion into the Connector

Once the contacts are property crimped onto the wire, they are inserted into the appropriate cavity of the connector by means of an insertion tool (OMEGA's MTC-IT). Assembly of the contacts into the connector must be made with reasonable care to avoid damage to the insulation.

1. Lubricate the wire cavities in the back face of insert (on the connectors) with a very thin film of silicone oil, or equal, before inserting contacts.

2. Locate contact in insertion tool as shown in Figure 3-7.

3. Align contact with the hole in the rear face of the insert (see Figure 3-8). The alignment of the insertion tool with contact must be coaxial with the axis of the connector. When the contact has entered the rear seal portion of the insert, maintain alignment of contact and tool parallel to and in line with the hole. Insert the contact to full depth. User will hear contact click-in when seated fully in retention collet.

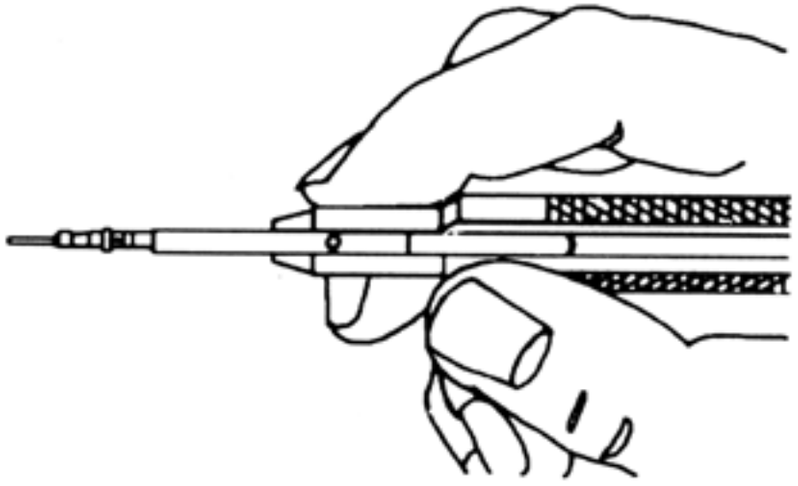


Figure 3-7. Locating Contact into Insertion Tool

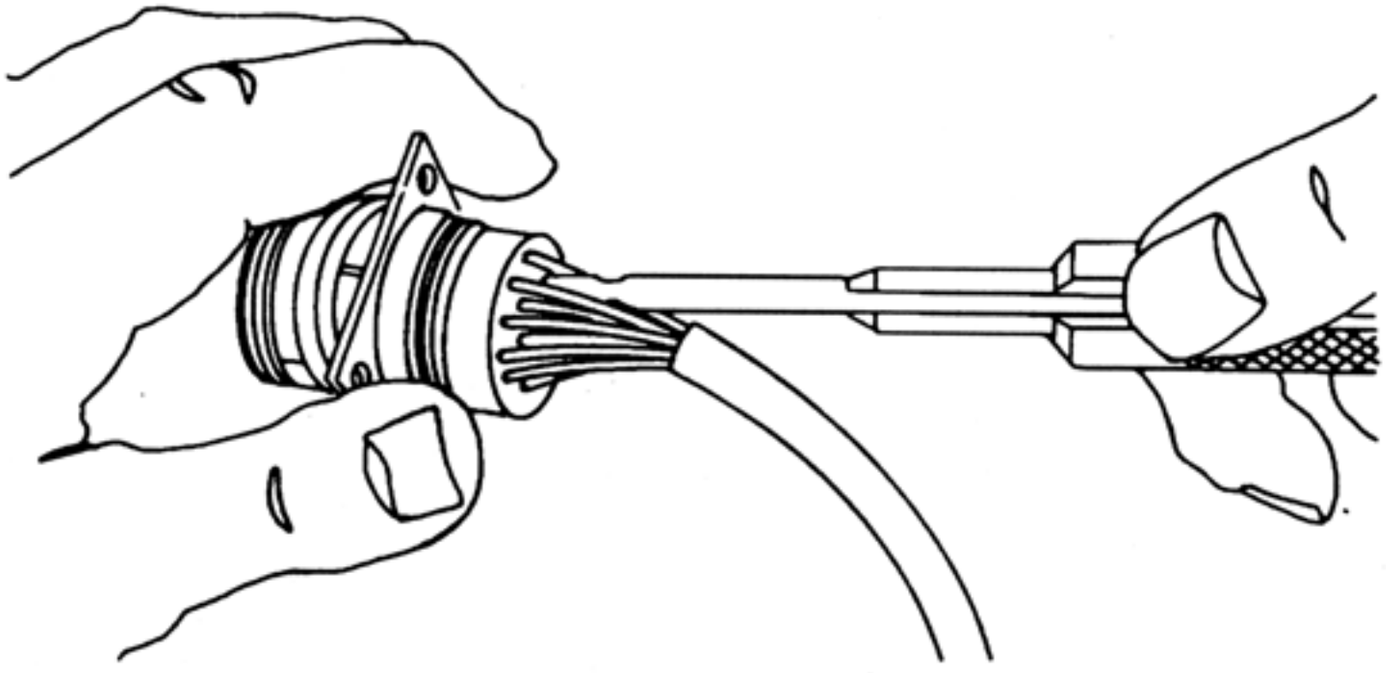


Figure 3-8. Aligning Contact

3.4.3 Contact Removal

A contact is removed from the connector insert with the extraction tool (OMEGA's MTC-RT).

1. Set the space sleeve in the proper position for removal of male or female contact.

2. Place tool over the contact and insert into the cavity (see Figure 3-9). The alignment of the removal tool with the contact must be coaxial with the axis of the connector.

3. Exert pressure axially to release retention collet. Spacer sleeve will shoulder at face of insulation when tool is inserted to proper depth.

4. Push extraction plunger to force the contact out of the rear of the insert.

5. Grasp contact or wire at the rear of the insert and pull to complete extraction.

6. Remove tool axially.

7. After using extraction tool the space sleeve should be set forward in last notch to protect the end of the plunger guide.

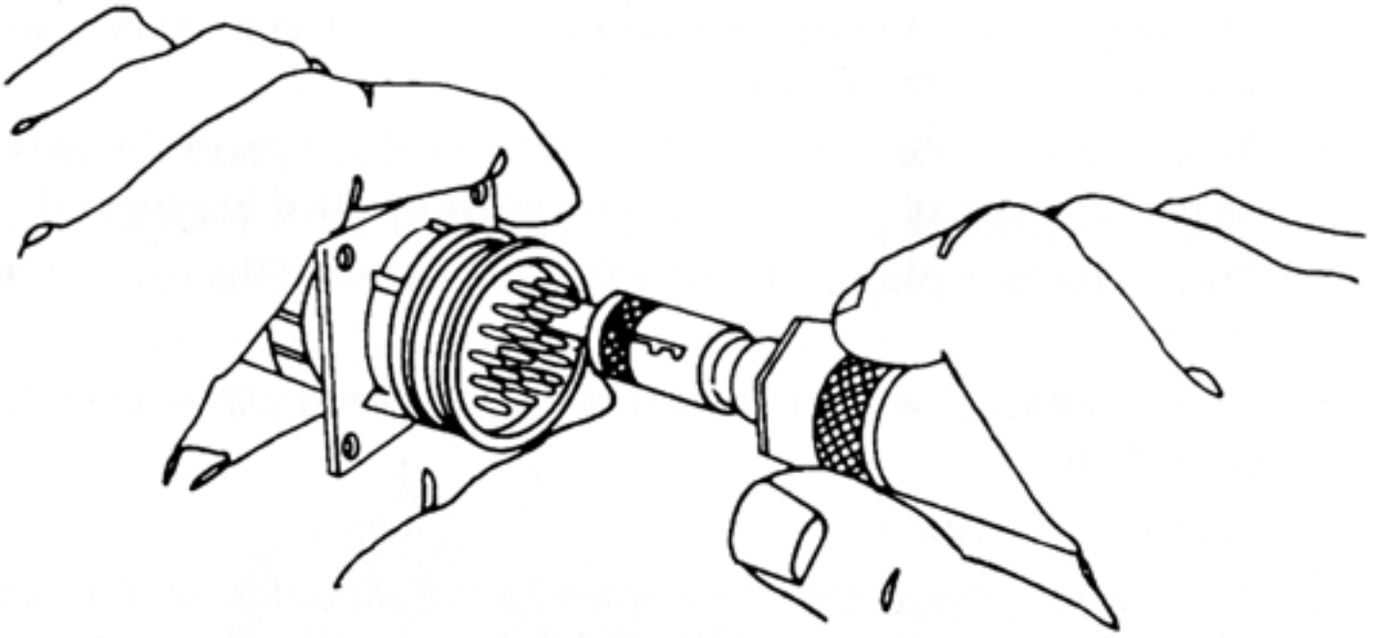


Figure 3-9. Alignment of Removal Tool

Notes

1 . MS standard assembly tools are required to properly crimp and assemble connectors.

2. Match pins and sockets to thermocouple alloys.
Example: A 12 cavity connector carries 6 thermocouple circuits (pairs) requiring 6 positive alloy pins or sockets, and 6 negative alloy pins or sockets per connector.

3. Order connectors in mating pairs. Style MC mates with Style FF.
Style MC mates with Style FC.

4. Backshell cable clamps are recommended with each cord style connector.

Notes

WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.

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RETURN REQUESTS/INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR <u>WARRANTY</u> RETURNS, please have the following information available BEFORE contacting OMEGA:

1. **Purchase Order number under which the product was PURCHASED,**
2. **Model and serial number of the product under warranty, and**
3. **Repair instructions and/or specific problems relative to the product.**

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