

### 1. INTRODUCTION

This specification covers the requirements for application of 2Pin&3Pin Miniature waterproof connectors (Plug & Receptacle) for use on lighting field.

When corresponding with TE Connectivity Personnel, use the terminology provided in this specification to facilitate your inquiries for information. Basic terms and features of this product are provided in Figure 1.

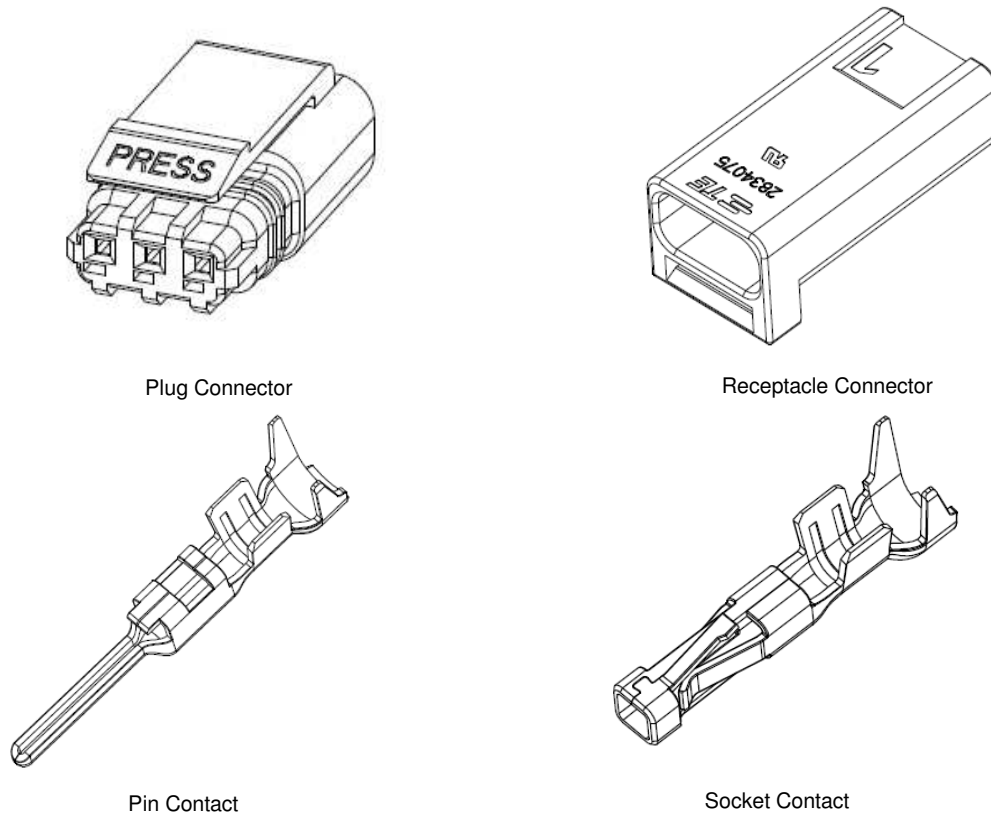


Figure 1

### 2. REFERENCE MATERIAL

#### 2.1. Revision Summary

Revision A – Initial release; Revision B – Revise for detail cable bending requirement

Revision C – Add Hand tool PN.

#### 2.2. Customer Assistance

Reference Product Base Part Numbers 2834067/2834068/2834074/2834075 are representative of the Miniature waterproof connector. Use of these numbers will identify the product line and expedite your inquiries through a service network established to help you obtain product information. Such information can be obtained through a local TE Connectivity Representative.

#### 2.3. Drawings

Customer Drawings for specific products are available from the responsible TE Connectivity Engineering department via the service network. The information contained in the Customer Drawings takes priority if there is a conflict with this specification or with any other technical documentation supplied by TE Connectivity.

## 2.4. Instructional Material

Instruction Sheets (408-series) provide product assembly instructions or tooling setup and operation procedures and Customer Manuals (409-series) provide machine setup and operating procedures. Documents available that pertain to this product are:

- 408-3295 Preparing Reel of Contacts for Applicator Tooling
- 408-7424 Checking Terminal Crimp Height or Gaging Die Closure
- 408-10389 Ocean Side-Feed Applicators
- 408-8059 General Preventive Maintenance for Applicators
- 408-8547 CERTI-CRIMP\* II Straight Action Hand Tools
- 408-9816 Handling of Reeled Products
- 409-5128 AMP-O-LECTRIC\* Model "K" Terminating Machines 565435-5 (Obsolete)
- 409-5842 AMP-O-LECTRIC Model "G" Terminating Machines 354500-[ ]
- 409-5852 AMPOMATOR\* CLS III-G Lead-Making Machines 122500-[ ] (Obsolete)
- 409-5866 AMPOMATOR CLS IV Lead-Making Machines 217500-[ ]
- 409-5878 AMPOMATOR CLS IV+ Lead-Making Machines 356500-[ ] (Obsolete)
- 409-10016 Entry Level Terminator (ELT) Machines 1338600-[ ]
- 409-10027 Stripping Modules 1490500 and 1490502
- 409-10029 Stripping Modules 1490501 and 1490503

## 2.5. Specifications

Product Specification 108-137093 provides expected product performance and test information.

## 3. REQUIREMENTS

### 3.1. Safety:

**DO NOT** stack product shipping containers so high that the containers buckle or deform.

### 3.2. Limitations:

The connectors are designed to operate in a temperature range of  $-40^{\circ}\text{C}$  to  $105^{\circ}\text{C}$ .

### 3.3. Material

Contact is made of copper alloy; Housing is made from UL 94V-0 rated thermal plastic.

### 3.4. Storage

#### A. Ultraviolet Light

Prolonged exposure to ultraviolet light may deteriorate the chemical composition used in the connector material.

#### B. Shelf Life

The contacts and connectors should remain in the shipping containers until ready for use to prevent deformation to components. The components should be used on a first in, first out basis to avoid storage contamination that could adversely affect performance.

#### C. Chemical Exposure

**DO NOT** store the contacts or connectors near any chemical listed below as they may cause stress corrosion cracking in the components.

Alkalies	Ammonia	Citrates	Phosphates Citrates	Sulfur Compounds
Amines	Carbonates	Nitrites	Sulfur Nitrites	Tartrates

**3.5. Wire Selection and Preparation**

The contacts accept stranded wire sizes 22 through 20 AWG (UL Style 1007) and 18AWG (UL style 1061) with an insulation diameter range of 1.6 to 2.0. Proper strip length is necessary to properly insert the wire into the contact. The strip length of the wire is given in Figure 2.

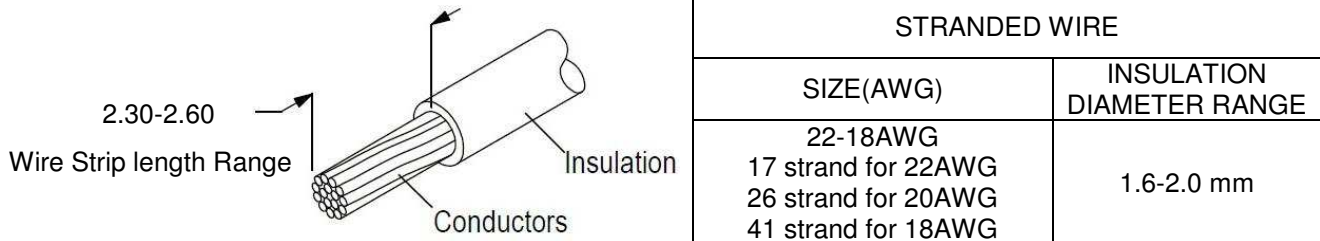


Figure 2

**3.6. Contact Crimp Requirements**



**NOTE**

Lubrication is required when crimping these contacts. It is recommended using Hydraulic Oil 22014 or Stoner Terminal Lubricant E807PT.



**CAUTION**

Wire insulation must NOT be cut or broken during the crimping operation. Reasonable care should be taken to prepare undamaged wire terminations.

The contact must be crimped to the wire according to instructions packaged with the application tooling.

**A. Cutoff Tab and Burr**

Cutoff tabs are the remaining portion of the carrier strip after the contact is cut from the strip. The following dimensional requirements will ensure proper application for these contacts. Refer to Figure 3.

- The cutoff tab must not extend beyond the insulation barrel more than the limit given.
- The burr resulting from the cutoff tab shearing must not exceed the dimension given.

**B. Locking Lance**

The locking lance must be free of damage.

**C. Retention Feature**

There must be no damage or distortion to the spring members of the receptacle contact or the tab end of the tab contact.

**D. Conductor Location**

The wire insulation and conductor must be visible within the transition area (between the contact insulation barrel and wire barrel). The insulation must not enter the wire barrel. The wire conductor ends must be flush with or extend slightly beyond the wire barrel to the limit provided in Figure 3.

**E. Wire Barrel Crimp**

The crimp applied to the wire barrel of the contact is the most compressed area and is most critical in ensuring optimum electrical and mechanical performance of the contact. The wire barrel must have the "F" crimp, where the tips of the wire barrel turn inward and capture the wire strands. The wire barrel crimp height

and width must be within the dimensions provided in Figure 3.

**F. Insulation Barrel Crimp**

The insulation barrel crimp supports the wire insulation. The insulation barrel must be crimped so that the tips of the insulation barrel wrap around and capture the wire insulation. The insulation barrel crimp width is given in Figure 3.

**G. Effective Crimp Length**

Effective crimp length is defined as that portion of the wire barrel, excluding bellmouths, fully formed by the application tooling. For optimum crimp effectiveness, the crimp must be within the limits given in Figure 3.

**H. Wire Barrel Seam**

The seam between the two sides of the wire barrel must be completely closed and there must be no evidence of wire strands or loose wire strands visible in the seam.

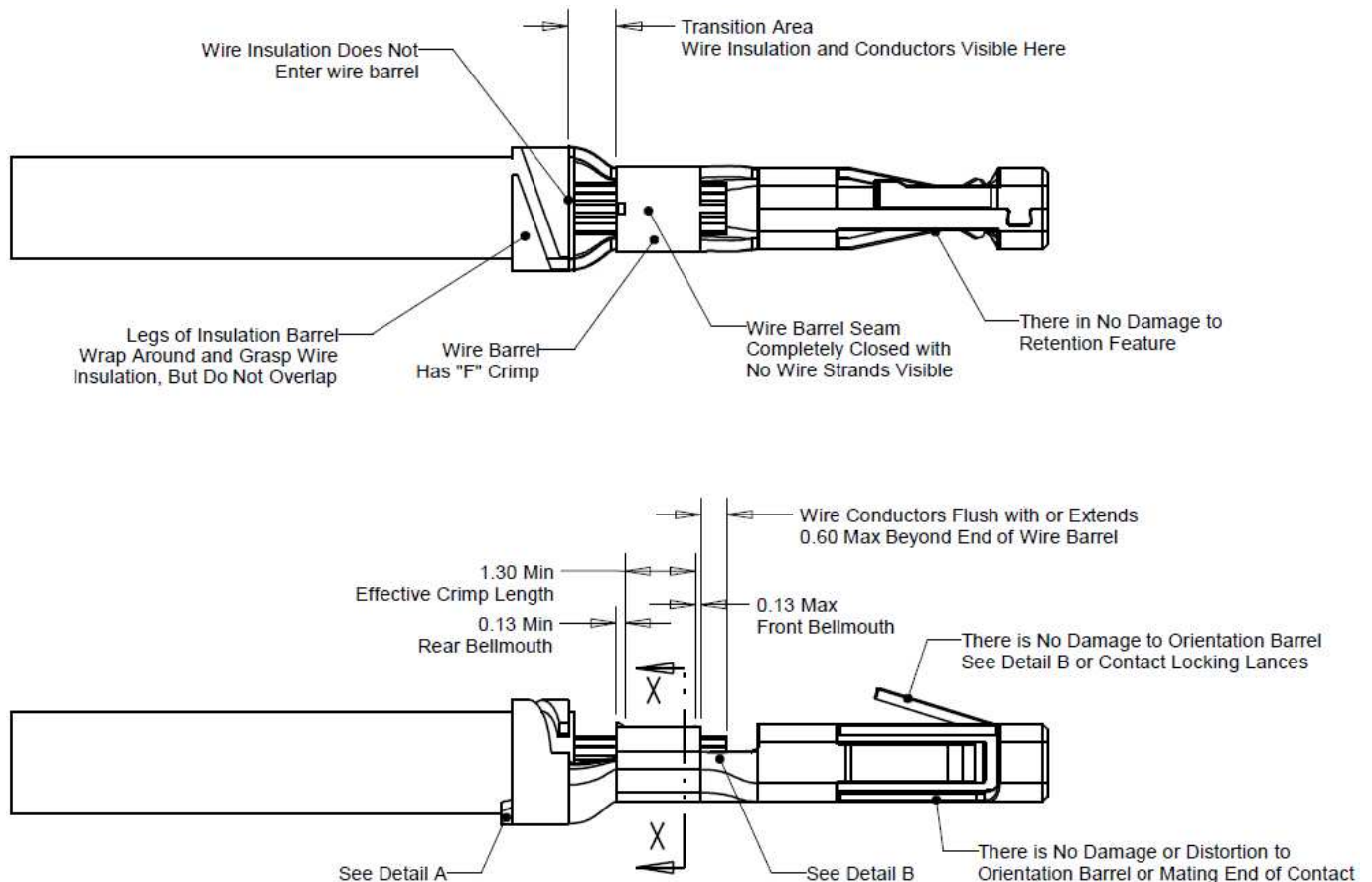
**I. Insulation Barrel Seam**

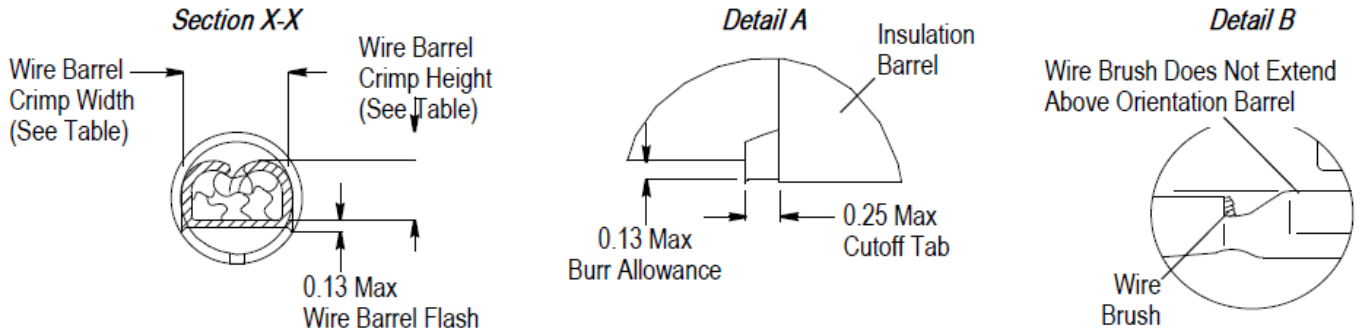
The two legs of the insulation barrel must completely grasp the wire insulation, but not overlap on top of one another.

**J. Bellmouths**

The front and rear bellmouths caused by extrusion of the contact material during crimping must be within the limits given in Figure 3.

Note: Receptacle contact shown; same requirements apply to the tab contact





Note: The developed crimp configurations result from using the specific tooling described in Section 5, TOOLING.

WIRE SIZE(AWG)	CONTACT			
	WIRE BARREL CRIMP		INSULATION BARREL CRIMP	
	APPLICATOR		APPLICATOR	
	HEIGHT ±0.05	WIDTH (REF)	HEIGHT (REF)	WIDTH (REF)
22	0.76	1.40	1.82	2.03
20	0.87	1.40	2.05	2.03
18	1.05	1.40	2.26	2.03

Figure 3

**K. Wire Barrel Flash**

Wire barrel flash is the formation that may appear on both sides of the wire barrel as the result of crimping. It must not exceed the dimension provided in Figure 3.

**L. Orientation Barrel**

There must be no damage or distortion to the orientation barrel of the contact.

**M. Straightness**

The force applied during crimping may cause some bending between the wire barrel and the mating portion of the contact. Such deformation is acceptable within the following limits given in Figure 4.

- Up-and-Down: The crimped portion, including cutoff tab and burr, must not be bent beyond the limits given.
- Side-to-Side: The crimped portion must not be bent from one side to the other beyond the limits given.

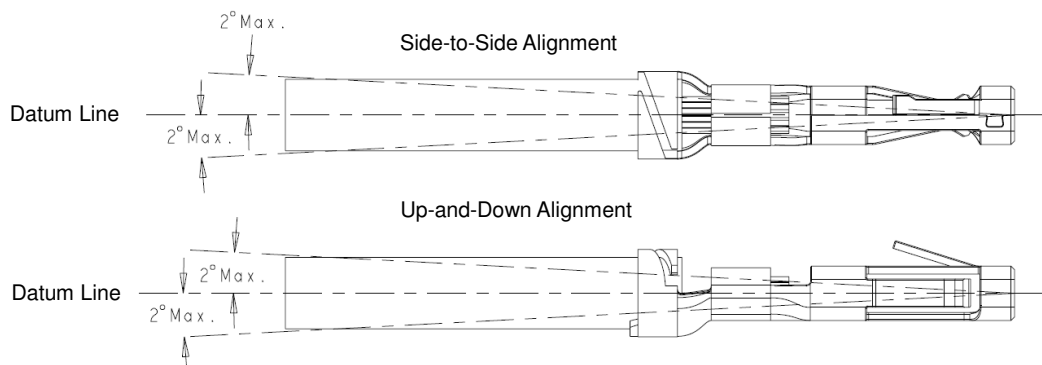


Figure 4

### 3.7. Contact Insertion

**IMPORTANT:** The interface seal must not be touched when handling the housing or during contact insertion.

**CAUTION**



Care must be taken to keep the interface seals clean and protected from damage. The interface seal must not be touched or contact equipment or packaging material, such as cardboard or paper; otherwise, the necessary surface lubricant will wipe off of the interface seal. A damaged or dry interface seal will cause the connector to not function properly.

**CAUTION**



Pin contacts are for use with receptacle housings only. Pin contacts must not be inserted into plug housings. Receptacle contacts are for use with plug housings only. Receptacle contacts must not be inserted into receptacle housings. Contacts should not be extracted from the housing. Extraction may damage the contact, wire seal, or housing.

The contact orientation barrel must be aligned with the contact cavity orientation feature located at the back (mating face) of the plug housing or receptacle housing. The contact should be properly oriented before attempting to insert it into the contact cavity of the housing. In order to prevent damage to the wire seal, the contact must be inserted slowly and straight (not turned) as it passes through the seal and into the housing. When the contact is fully inserted, the contact locking lances will engage the housing contact retention shoulder. After insertion, the wire should be pulled back lightly to ensure that the contact is fully seated. Refer to Figure 5.

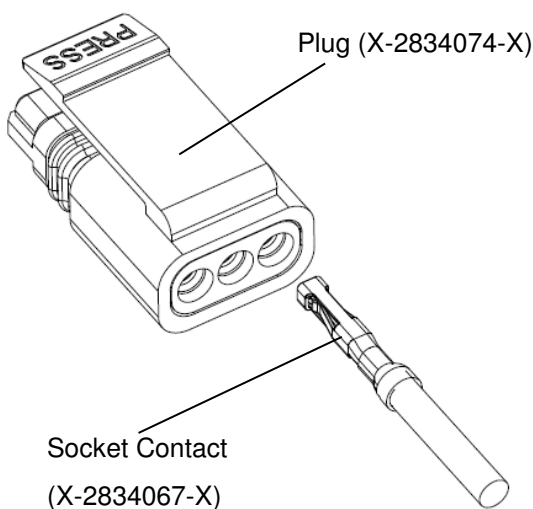
**NOTE**



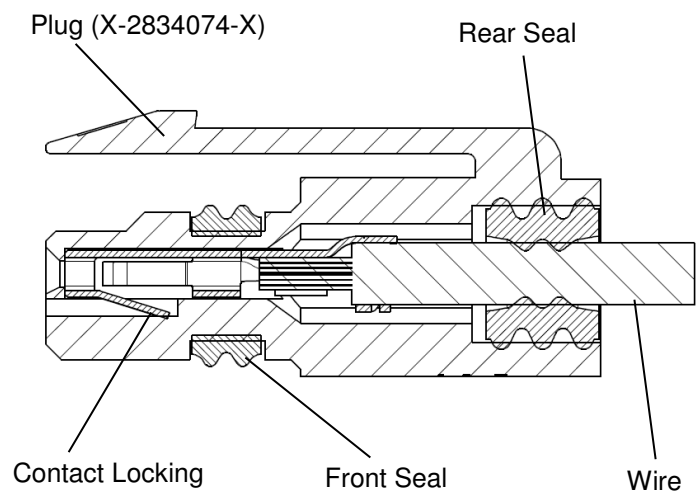
An insertion tool is not required to insert contacts into the plug housing or receptacle housing.

Turn off power before installing the contacts. After fully insertion, the crimping contact side with cable is for ONE TIME USE ONLY, DO NOT REMOVE AND REPLACE CRIMP WIRES.

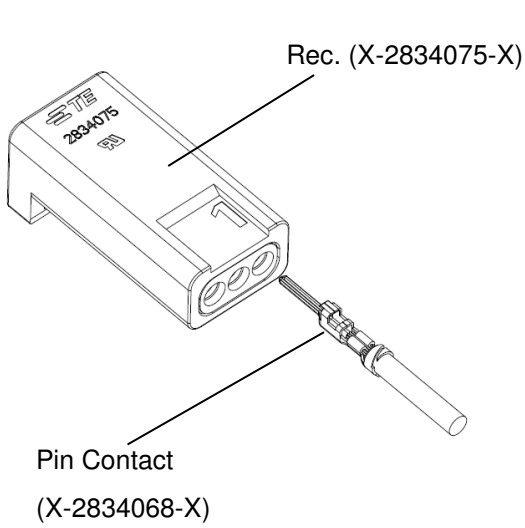
Aligning Socket Contact with Receptacle Housing



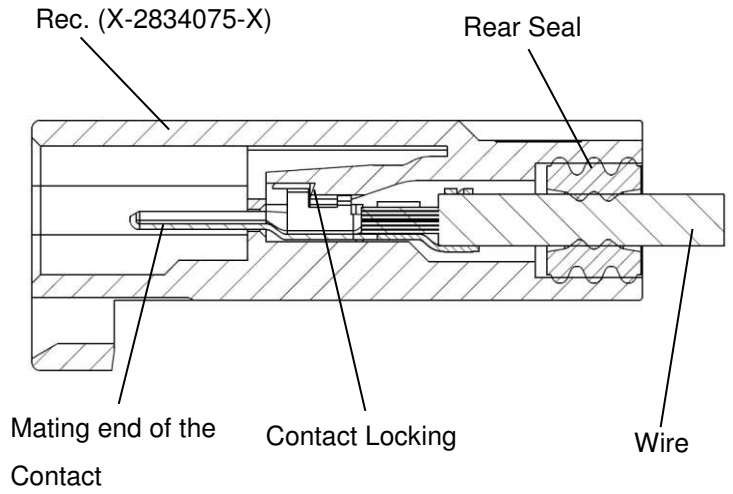
Aligning Socket Contact with Receptacle Housing



Socket Contact Fully Inserted into Plug Housing

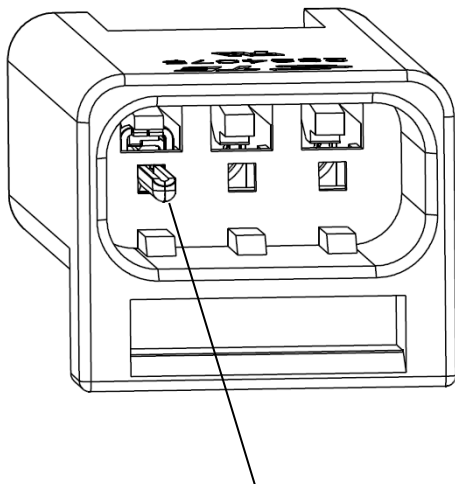


Aligning Pin Contact with Receptacle Housing



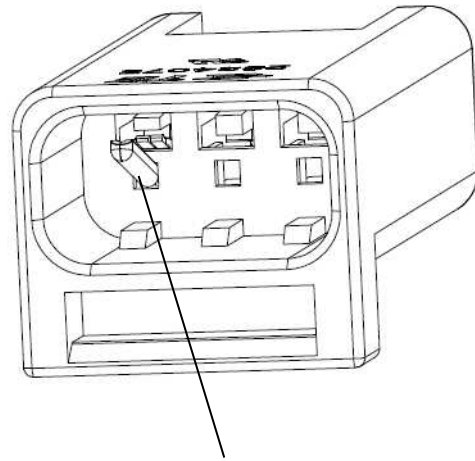
Pin Contact Fully Inserted into Plug Housing

Correct Installation of Pin contact



Mating End of Tab Contact Through Lower Opening

Incorrect Installation of Pin contact



Mating End of Tab Contact Through Upper Opening

Figure 5

### 3.8. Mating Connectors

The plug has an integral locking latch that should be fully seated and latched to the receptacle locking ledge after mating. The locking latch and locking ledge ensure positive mating of connectors. **DO NOT ALLOW REVERSING MATING(UP SIDE DOWN)**. Firstly align the polarized mating faces of the housings, and grasp the housings and push to mate with each other. **DO NOT** force the housings to mate. When fully mated, the housings must appear bottomed with each other and flush at the point of engagement. See Figure 6.

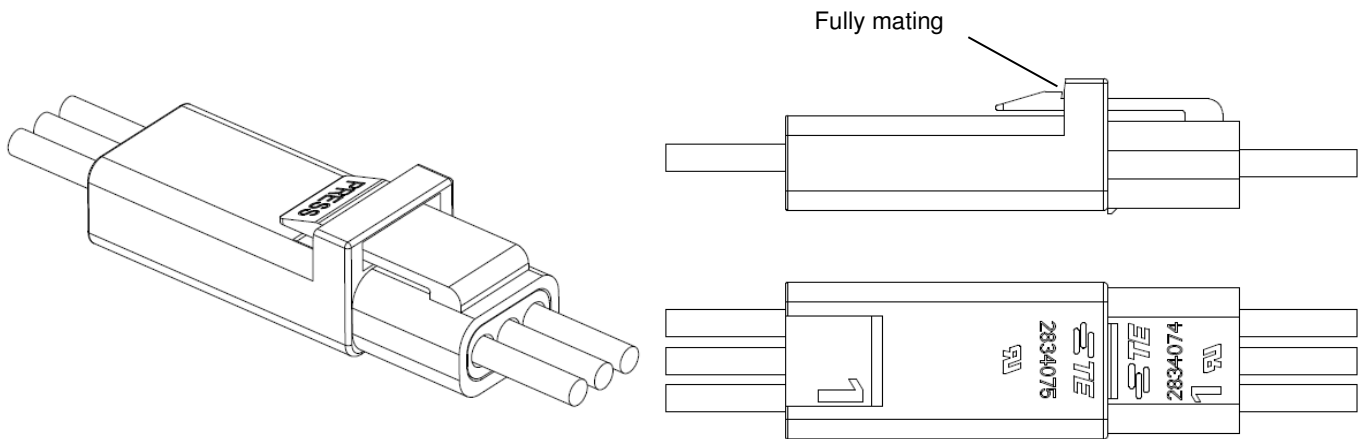


Figure 6 Mated status

### 3.9. Connector Unmating

To reduce risk of electrical shock, **DISCONNECT** the electrical supply before unmating the connectors.

To unmate the connectors, pushing the plug latch, grasp the connector at each end and pull apart the mated connectors. **DO NOT** pull on the wires when unmating the connectors. See Figure 7.

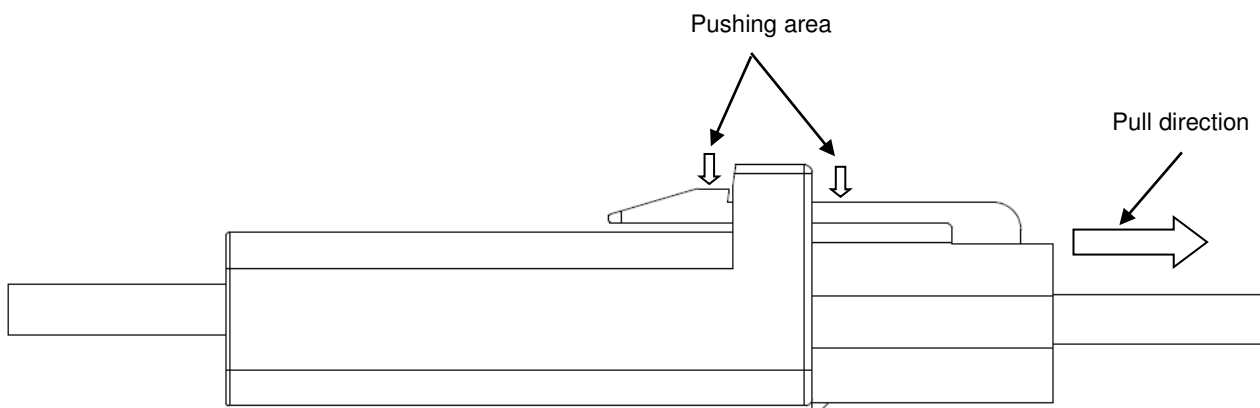


Figure 7



### 3.7. Replacement/Repair

The contacts and housings are not repairable. **DO NOT** use damaged or defective contacts or housings. **DO NOT** remove the wire and re-terminate contacts.

### 4. QUALIFICATION

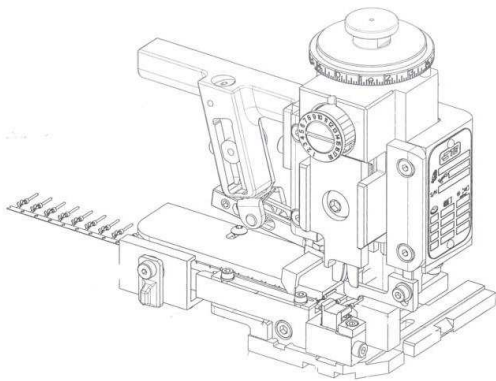
Connectors are Component Recognized by Underwriters Laboratories, Inc.  
UL1977 Approval: E28476.

### 5. TOOLING

Tooling part numbers and instructional material packaged with the tooling are given in Figure 8.

#### 5.1. Applicator and Hand tool

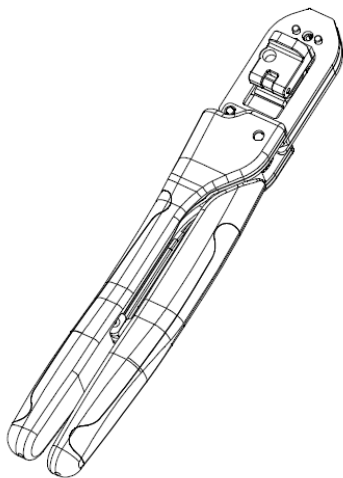
The applicators are designed to crimp strip-form contacts onto pre-stripped wire, and provide for high volume, heavy duty production requirements. These applicators can accept interchangeable crimping dies. The Hand tool are designed to crimp loose piece contacts for low volume requirements. See Figure 8.



WIRE SIZE(AWG)	APPLICATOR PN
22-18	*-2836413-*

\*-- Refer to Applicator Customer Drawing for applicable dash number.

Applicator



WIRE SIZE(AWG)	HAND TOOL PN
22-18	2305567-*

\*-- Refer to Hand tool Customer Drawing for applicable dash number.

Hand tool

Figure 8

**6. VISUAL AID**

The illustration below shows a typical application of Miniature waterproof connectors and contacts. This illustration should be used by production personnel to ensure a correctly applied product. Applications which DO NOT appear correct should be inspected using the information in the preceding pages of this specification and in the instructional material shipped with the product or tooling.

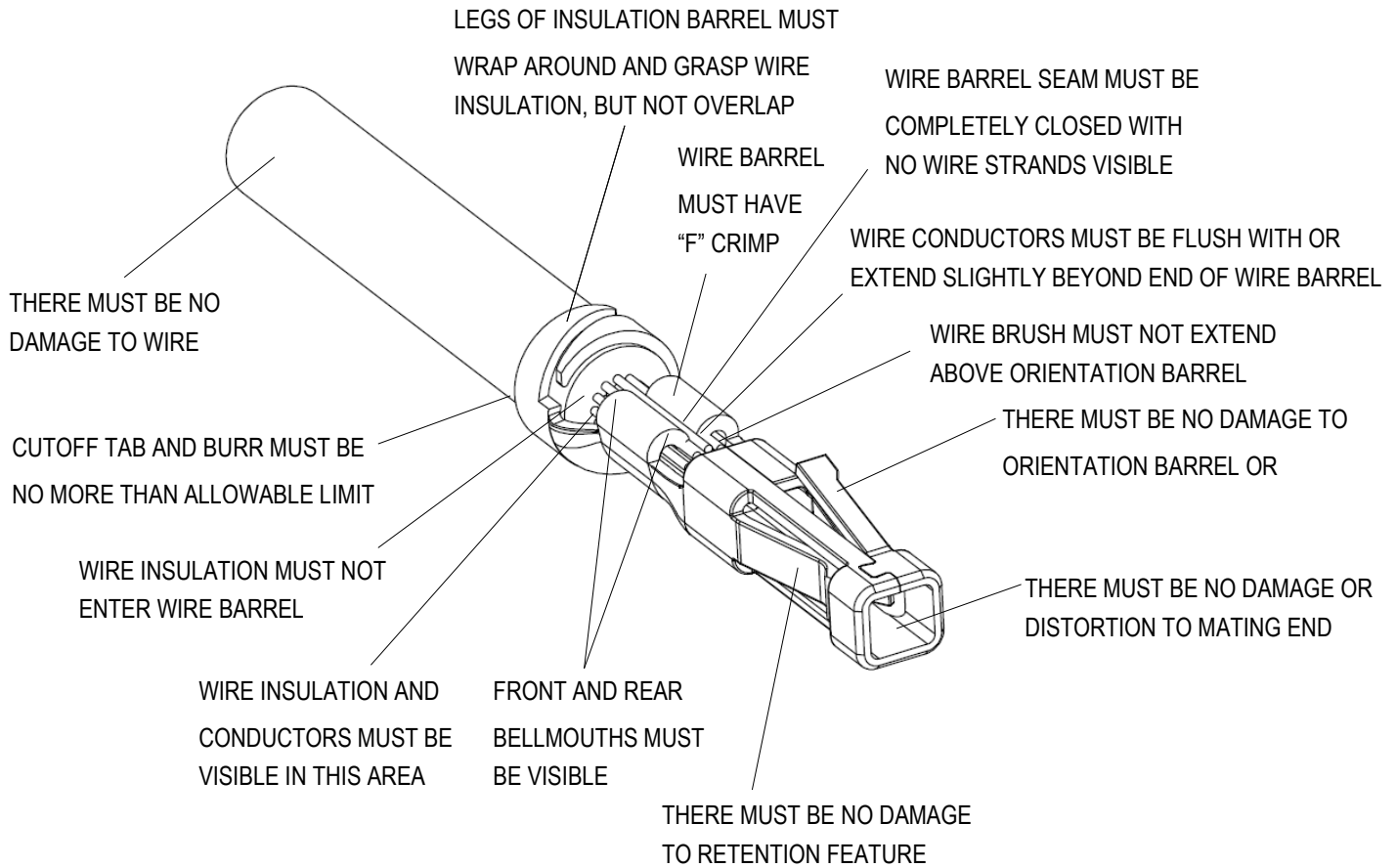


Figure 9

After mating for the application, please make sure keep at least 5mm straight line before bending the wires. Please review the following picture for detail (Figure 10).

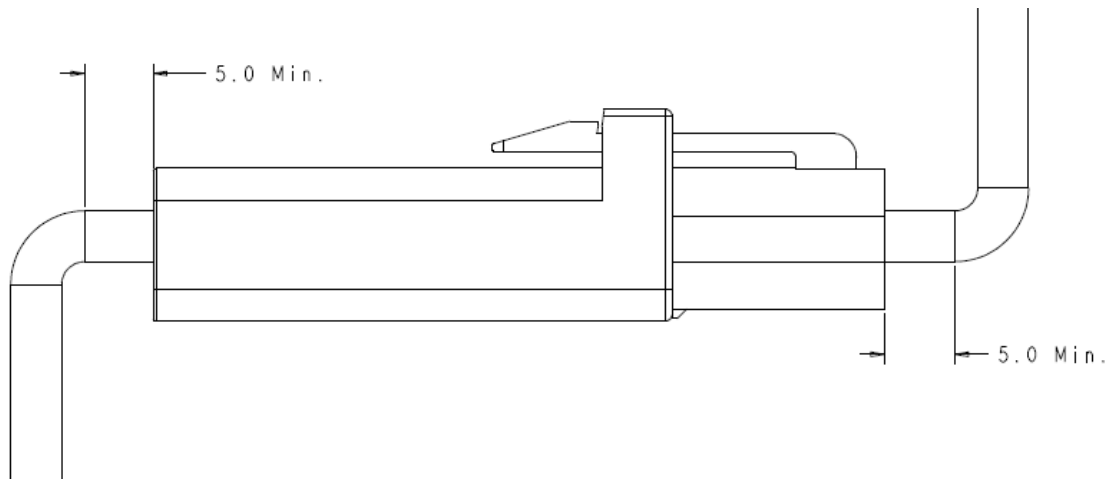


Figure 10