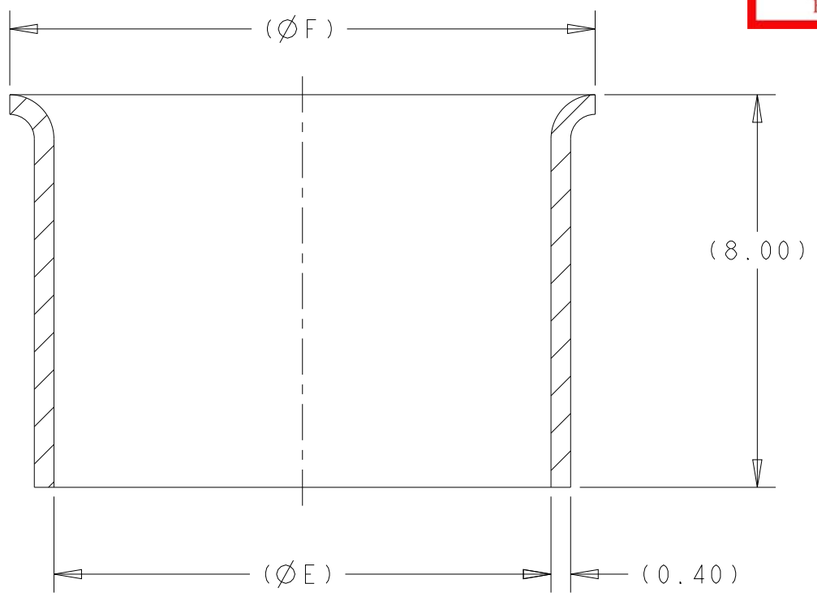
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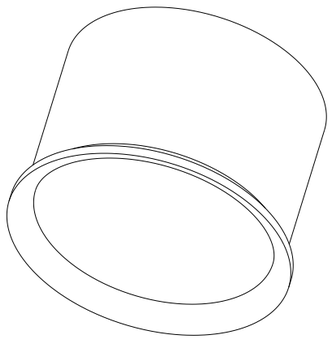
勝特力電材超市-龍山店 886-3-5773766
勝特力電材超市-光復店 886-3-5729570
胜特力电子(上海) 86-21-34970699
胜特力电子(深圳) 86-755-83298787
http://www.100y.com.tw

REVISIONS

P	LTR	DESCRIPTION	DATE	DWN	APVD
	A1	ECO-10-022743	05NOV2010	DR	DR
	A2	ECO-11-024207	02DEC2011	DR	DR
	A3	ECO-13-012771	08AUG2013	DR	DR
	A4	ECR-22-148725	11AUG2022	SM	SS



SECTION A-A



SCALE 4:1

1. MATERIAL 1:
   TYPE: COPPER ALLOY
2. MATERIAL 2:
   TYPE: ALTERNATE COPPER ALLOY, NO ANNEALING
3. FINISH:
   UNDERPLATE TYPE: NICKEL
   TOP PLATE TYPE: TIN
4. FINISH: BARE
5. PARTS MUST BE FREE OF EXCESSIVE BURRS, CRACKS, OR OTHER VISUAL IMPERFECTIONS THAT MAY AFFECT FIT FORM OR FUNCTION

2	4	13.93	12.13	1.26g	A	1-1587724-3
1	3	13.93	12.13	1.26g	A	1587724-3
2	4	12.93	11.13	1.15g	A	1-1587724-2
1	3	12.93	11.13	1.15g	A	1587724-2
2	4	11.93	10.13	1.00g	A	1-1587724-1
1	3	11.93	10.13	1.00g	A	1587724-1
MATERIAL	FINISH	F	E	WEIGHT	REV	PART NO

THIS DRAWING IS A CONTROLLED DOCUMENT.

DIMENSIONS: mm

TOLERANCES UNLESS OTHERWISE SPECIFIED:
0 PLC ±
1 PLC ±0.15
2 PLC ±0.10
3 PLC ±
4 PLC ±
ANGLES ±1°

MATERIAL: SEE TABLE

FINISH: SEE TABLE

DWN D SIMPSON 02JUN2008
CHK A TYLER 02JUN2008
APVD J. BOLEWITZ 02JUN2008
PRODUCT SPEC
APPLICATION SPEC
WEIGHT SEE TABLE

TE Connectivity

NAME
OUTER FERRULE
HVA280 MULTI-CORE
-

SIZE	CAGE CODE	DRAWING NO	RESTRICTED TO
A3	00779	C-1587724	-

CUSTOMER DRAWING | SCALE 8:1 | SHEET 1 OF 1 | REV A4

NOTE

All numerical values are in metric units [with U.S. customary units in brackets]. Dimensions are in millimeters. Unless otherwise specified, dimensions have a tolerance of ±0.13 and angles have a tolerance of ±2°. Figures and illustrations are for identification only and are not drawn to scale.

DANGER
HIGH-VOLTAGE - MORTAL DANGER

- *This connector is intended for use in high-voltage applications. Special care must be applied to ensure that the connector functions as intended.*
- *If you suspect that the connector has been modified, damaged, contaminated, or otherwise compromised, please discontinue its use immediately.*
- *This connector should only be serviced by a trained and qualified technician.*

1. INTRODUCTION

This specification covers the requirements for application of the Sealed Three-Position AMP+ HVA280-3pxm High-Voltage Plug Connector. This AMP+ HVA280 system is designed for a metric wire size range of 2.5 mm^2 to 4 mm^2. The connector incorporates conductive EMI shields to prevent excess emissions in the application.

This AMP+ HVA280 connector system is available in three different keying or polarizing configurations. Unmating of the connector system requires a flat-bladed screwdriver.

This AMP+ HVA280 connector system incorporates up to three 2.8 mm receptacle terminals in the plug connector which mate to up to three 2.8 mm blade terminals in the header assembly. Termination tooling is available for both types of contacts. The connector is molded in orange to denote a high voltage system.

CAUTION
These high-voltage connectors must NOT be mated with any other type of connector.

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.

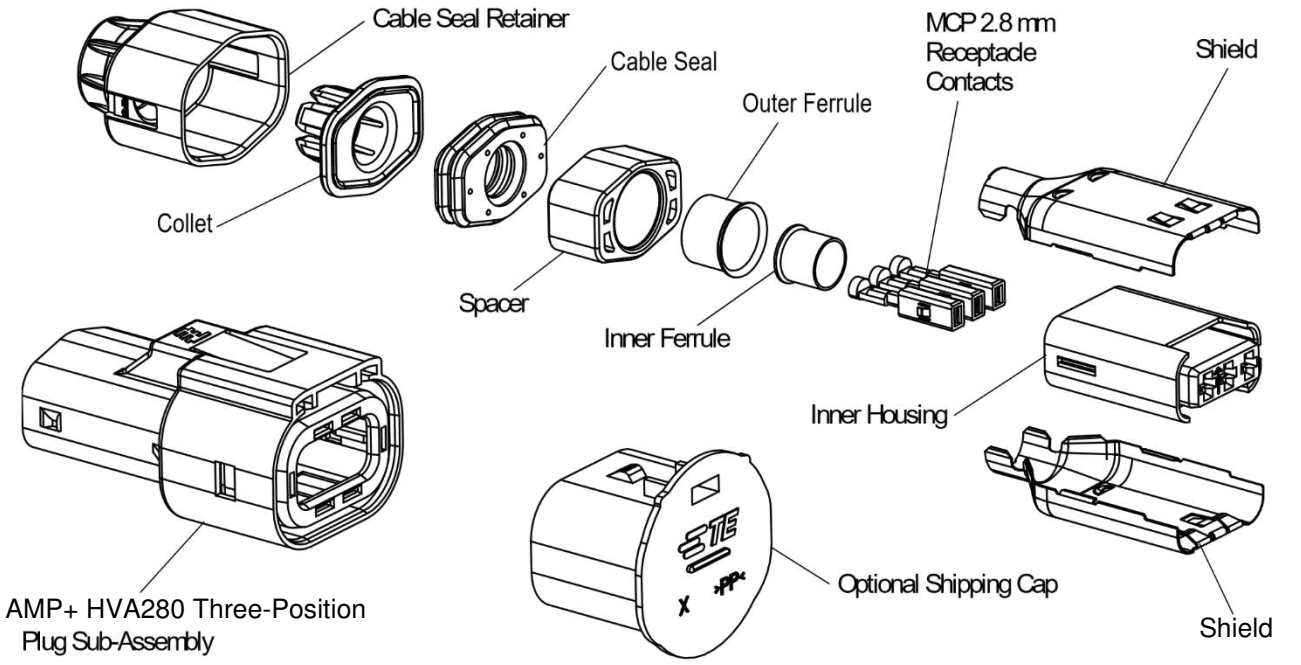


Figure 1

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2. REFERENCE MATERIAL

2.1. Revision Summary

Revisions to this application specification include:

- In section 2.2 & 2.3.B, added new reference drawing C-2359673
- In section 2.5, Added new supplier cable part number 84 132 059
- Added new supplier cable part number 84 132 059 in Figure 13.
- Added new supplier cable part number 84 132 059 in Figure 25.
- Added new column for 2393209-1 Die Set 2 under table in Figure 25.

2.2. Customer Assistance

Reference Part Number C-2103197 and C-2359673, Product Base Part Number 1587715, and Product Code K994 are representative of the Sealed Three-Position AMP+ HVA280-3pxm High-Voltage Plug Connector. Use of these numbers will identify the product line and help you to obtain product and tooling information. Such information can be obtained through a local TE Representative, by visiting our website at www.te.com, or by calling PRODUCT INFORMATION or the TOOLING ASSISTANCE CENTER at the numbers at the bottom of page 1.

2.3. Drawings

A. Customer Drawings

Customer Drawings for product part numbers are available from the service network. If there is a conflict between the information contained in the Customer Drawings and this specification or with any other technical documentation supplied, the Customer Drawing takes preference.

B. Reference Drawings

NOTE

Reference Drawing (C-2103197, C-2359673) is available for part number relationships only and is not a saleable item. Refer to this drawing only for compatible part numbers for customer inquiry. For more information on Reference Drawings, call PRODUCT INFORMATION at the number at the bottom of page 1.

2.4. Specifications

Product Specification 108-2395 provides product performance, tests, and quality requirements. Application Specification 114-18148-1 provides termination procedures and application requirements for the 1-968851-3 AMP MCP 2.8 receptacle terminals. Application Specification 114-18387 provides termination procedures and application requirements for the 1241390-3 AMP MCP 2.8K receptacle terminals.

2.5. Cable and Subcomponent Specification (Figure 2)

The following cable and subcomponent combinations have been validated by TE and should be used together to ensure optimum performance. Alternative cables may be used with the AMP+ HVA280-3pxm connector after ensuring performance through validation testing.

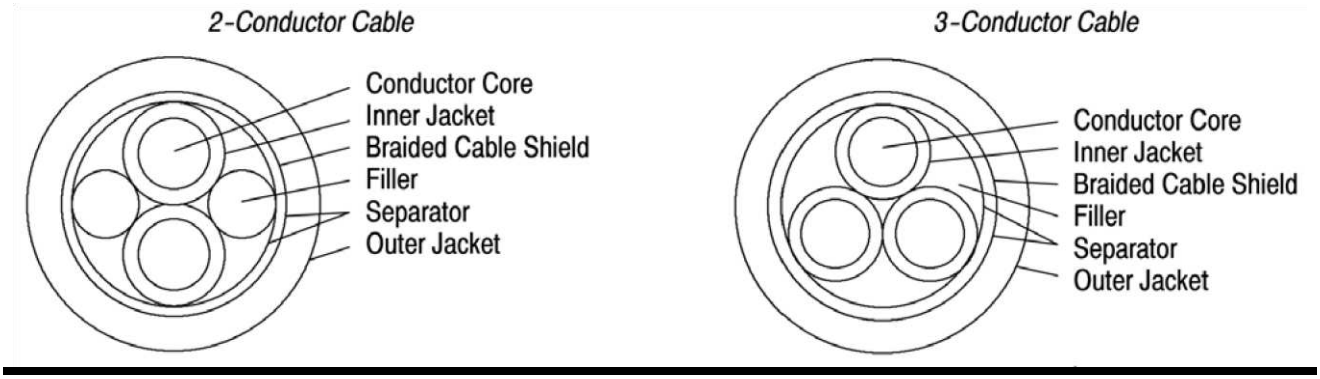


Figure 2 (Cont'd)

Cable Option	*Recommended Subcomponents:*
Cable Supplier: HITACHI Cable Construction: 3x 2.5 mm^2 Supplier Cable Part Number: ECS-038	1-968851-3 MCP Receptacle Contact, 2.8 1587718-1 Shield 1587723-1 Inner Ferrule 1587724-1 Outer Ferrule 2103188-1 Cable Seal 1587722-1 Cable Seal Retainer 2103189-1 Collet
Cable Supplier: HUBER+SUHNER Cable Construction: 3x 2.5 mm^2 Supplier Cable Part Number: 12 585 215 B 84 132 059	1-968851-3 MCP Receptacle Contact, 2.8 or 1241390-3 MCP, Receptacle Contact, 2.8K 1587718-1 Shield 1587723-1 Inner Ferrule 1587724-1 Outer Ferrule 2103188-2 Cable Seal 1587722-1 Cable Seal Retainer 2103189-2 Collet
Cable Supplier: HUBER+SUHNER Cable Construction: 2x 2.5 mm^2 Supplier Cable Part Number: 12 582 307 B	1-968851-3 MCP Receptacle Contact, 2.8 1587718-1 Shield 1587723-1 Inner Ferrule 1587724-1 Outer Ferrule 2103188-2 Cable Seal 1587722-1 Cable Seal Retainer 2103189-2 Collet

Figure 2 (End)

2.6. Instructional Material

The following list includes available instruction sheets (408- and 411-series) that may provide assembly procedures for product, operation, maintenance and repair of tooling, and customer manuals (409-series) that provides setup, operation, and maintenance of machines.

Document Number	Document Title
408-2498	Crimping Head Cross Reference for Pneumatic Tools
408-4070	Pneumatic Head Assembly 679304-1
408-4303	Pneumatic CERTI-CRIMP* Tool Holder Assembly 356302-1
408-7424	Checking Terminal Crimp Height Gaging Die Closure
408-9930	PRO-CRIMPER* III Hand Crimping Tool Frame Assembly 354940-1
408-10273	Sealed Three-Position HVA280 Header High-Voltage Connector System
409-5862	626 Pneumatic Tooling Assemblies 189721-[ ] and 189722-[ ]
411-18087	ERGOCRIMP Hand Tool 539635-1
411-18169	ERGOCRIMP Die 539723-2

HUBER+SUHNER is a trademark.

3. REQUIREMENTS

3.1. Safety

Do not stack contact packages so high that the shipping containers buckle or deform.

3.2. Shelf Life

The contacts should remain in the shipping containers until ready for use to prevent deformation to the contacts and/or damage to the housings. The products should be used on a first in, first out basis to avoid storage contamination that could adversely affect signal transmissions.

3.3. Chemical Exposure

Do not store contacts near any chemicals listed below, as they may cause stress corrosion cracking in the contacts.

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

3.4. Material

The connector assemblies are made of thermoplastic materials and the terminals and shields are tin and silver-plated copper alloy.

3.5. Circuit Identification

The terminal cavities are numbered on the inner housing of each connector at the wire entry end.

3.6. Assembly Procedures

The following procedures show the details of the inner housing assembly and insertion instructions of the inner housing assembly into the plug subassembly.

NOTE

Refer to Figure 2 for the various components of the cable as shown in an end view of the cable.

1. In the orientation shown in Figure 3, slide the cable seal retainer onto the cable first, then the collet, cable seal, spacer, then finally the outer ferrule.

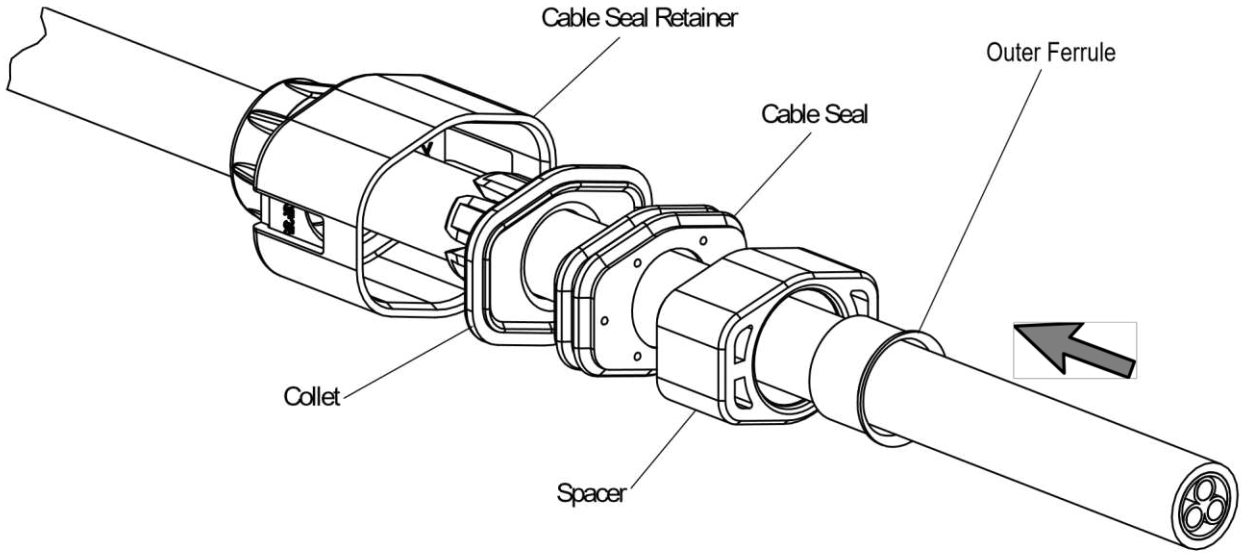


Figure 3

2. Strip and remove the outer cable jacket, and separator (if present), from the end, exposing the braided cable shield as shown in Figure 4.

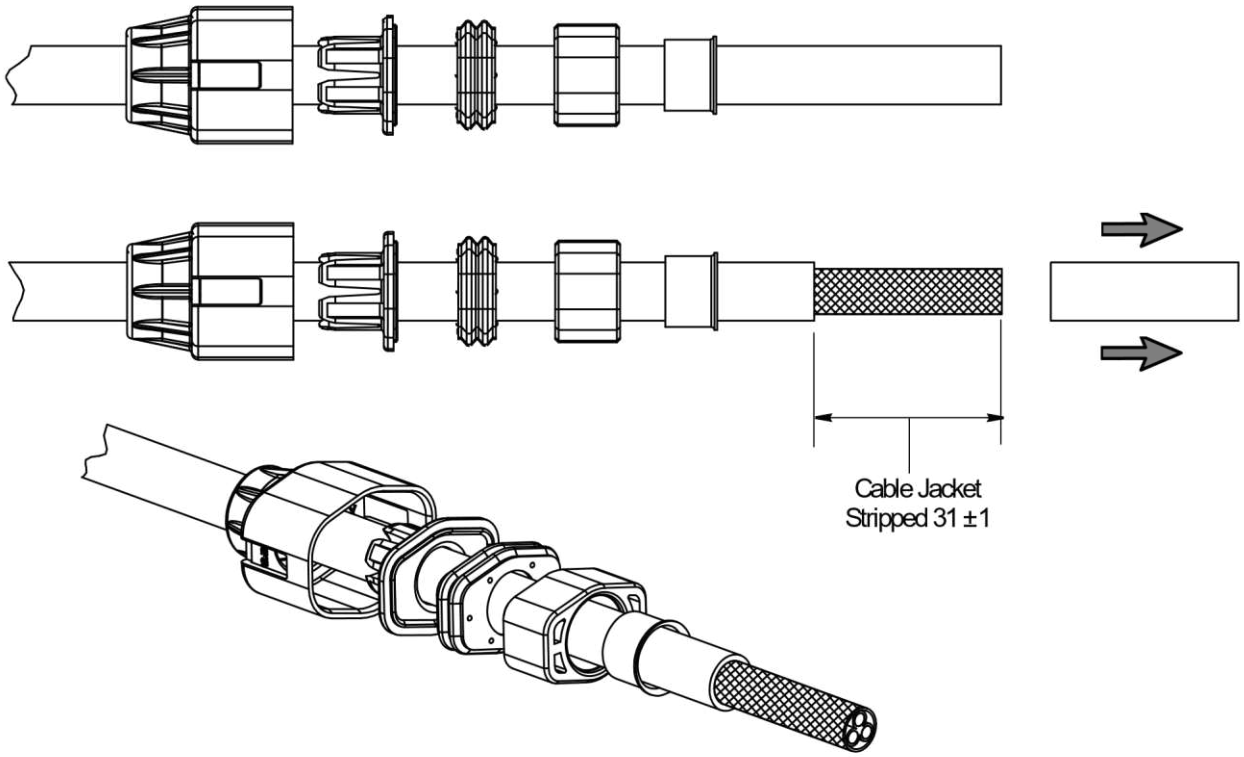


Figure 4

3. Insert the inner ferrule in the orientation shown over the cable shield until it stops against the outer jacket as shown in Figure 5.

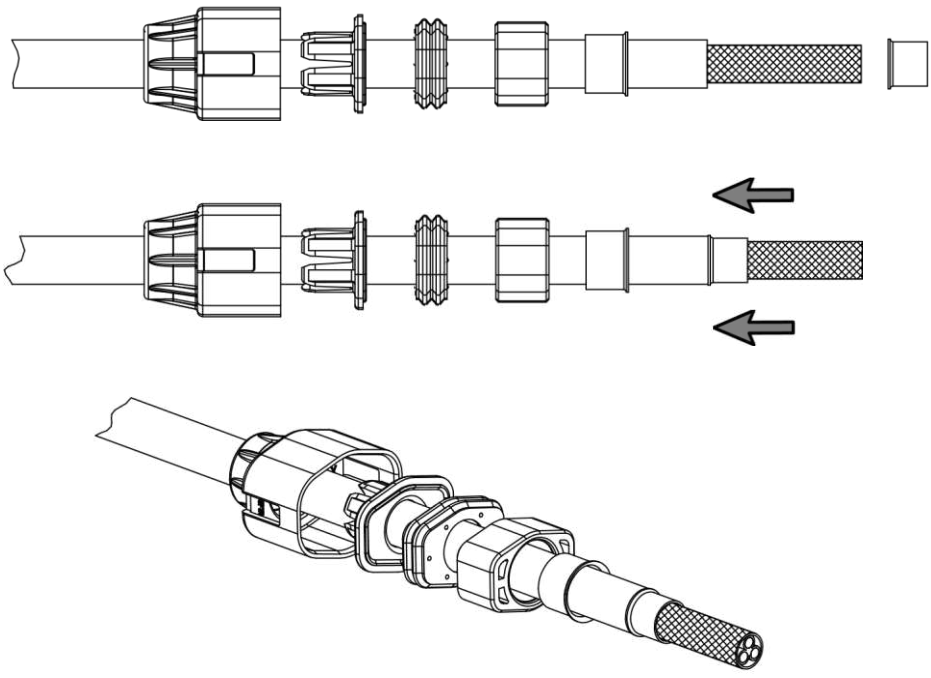


Figure 5

4. Fold the braided cable shield back over the inner ferrule and trim as shown in Figure 6. Remove filler and inner separator (if present).

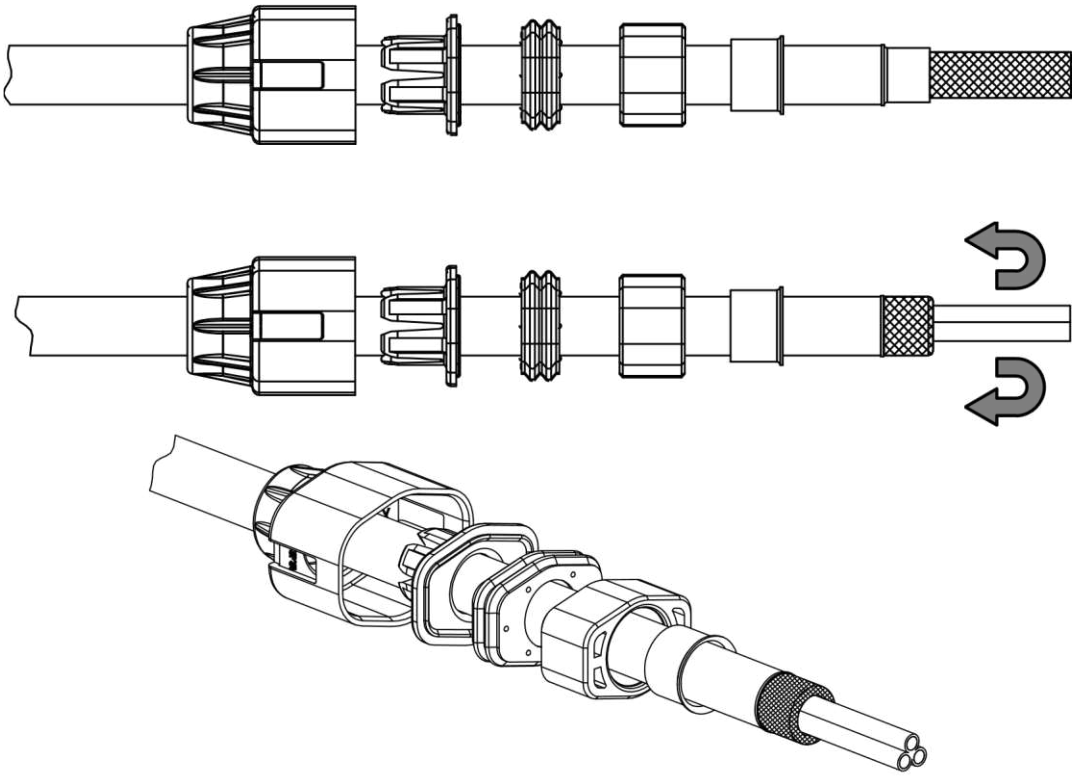


Figure 6

5. Separate conductors and strip to length as shown in Figure 7. Refer to Application Specification 114-18387 or 114-18148-1 for appropriate strip length.

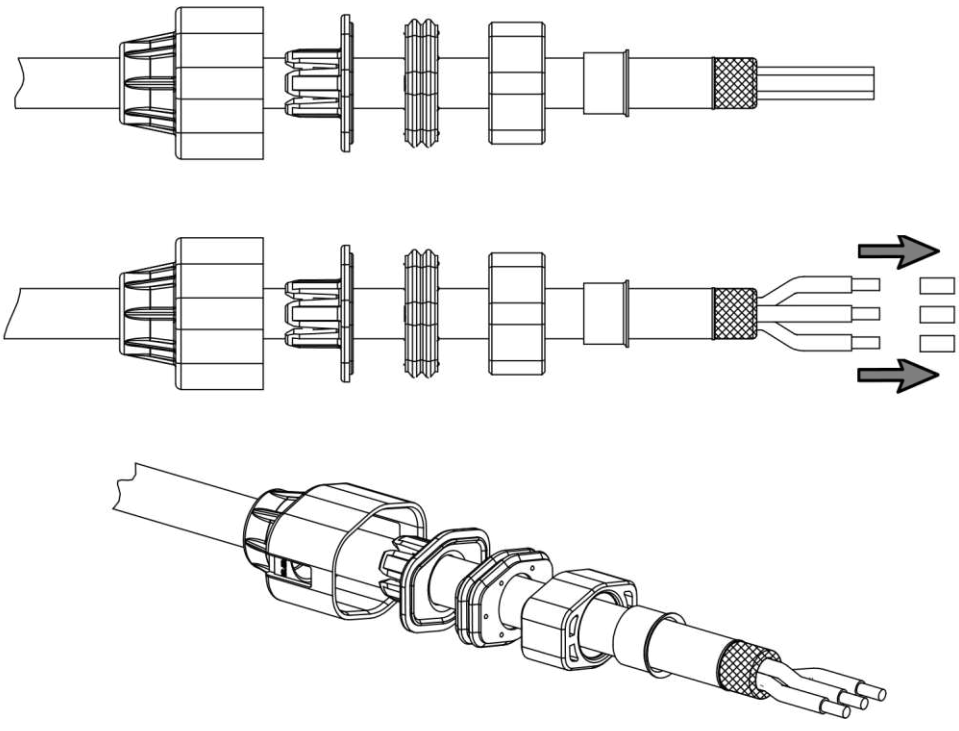


Figure 7

6. Crimp the receptacle contacts onto the terminal conductors as shown in Figure 8. Refer to Application Specification 114-18148-1 or 114-18387 for specific crimp information. Locate the contact to be crimped in the appropriate tooling according to the instructions packaged with that tooling. Detailed instructions covering the placement of contacts in the tooling and the use of such tooling is packaged with each tool. See Section 5,
TOOLING.

CAUTION
Wire insulation shall NOT be cut or broken during the crimping operation, nor shall the insulation be crimped into the contact wire barrel. Reasonable care should be taken by tooling operators to provide undamaged wire terminations.

NOTE
Periodic inspections must be made to ensure crimped contact formation is consistent as shown.

NOTE
Care should be taken to apply the contacts in such a way that minimal strain is required to orient the contact for insertion into the inner housing in the correct order.

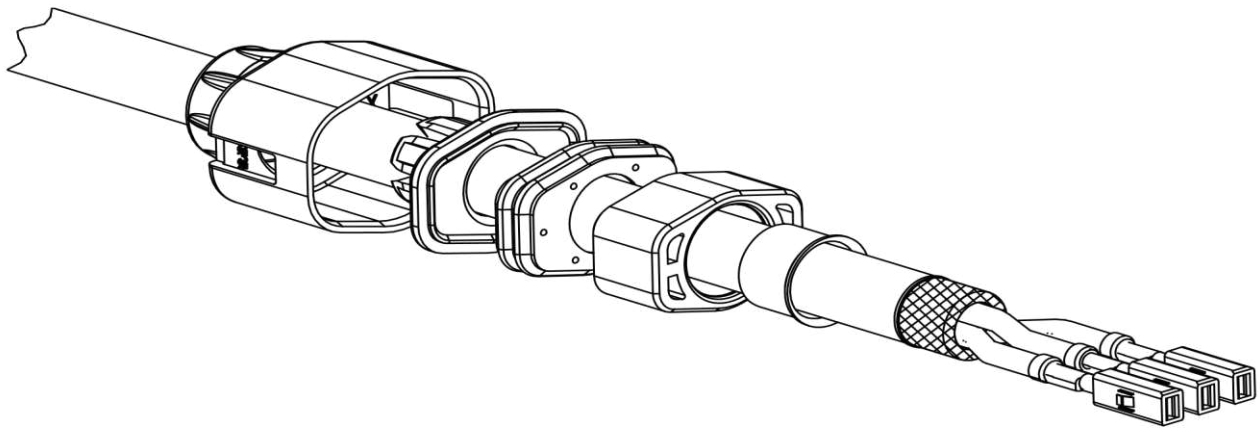


Figure 8

7. The following items must be inspected and verified:

- No loose conductor strands
- No loose cable shield strands
- Crimped in correct location
- No excess metallic foil or filler
- All components are present (cable seal retainer, collet, cable seal, spacer, outer ferrule, inner ferrule, receptacle contacts)

8. Pre-bend the conductors as shown in Figure 9A to align the terminals with the cavities and to prevent damage to the conductor jacket during shield assembly. Note the cavity number on the cable entry end of the inner housing (Figure 9B). Insert the receptacle contacts into the inner housing until they are fully locked. Verify that the contact is completely inserted as shown in Figure 9C by gently pulling back on the conductor.

NOTE
Make sure that the correct conductor color is matched with the correct inner housing cavity number.

CAUTION
It is essential that there are no mistakes in this step because there will be no chance to re-work the parts once the connector shield is crimped in place.

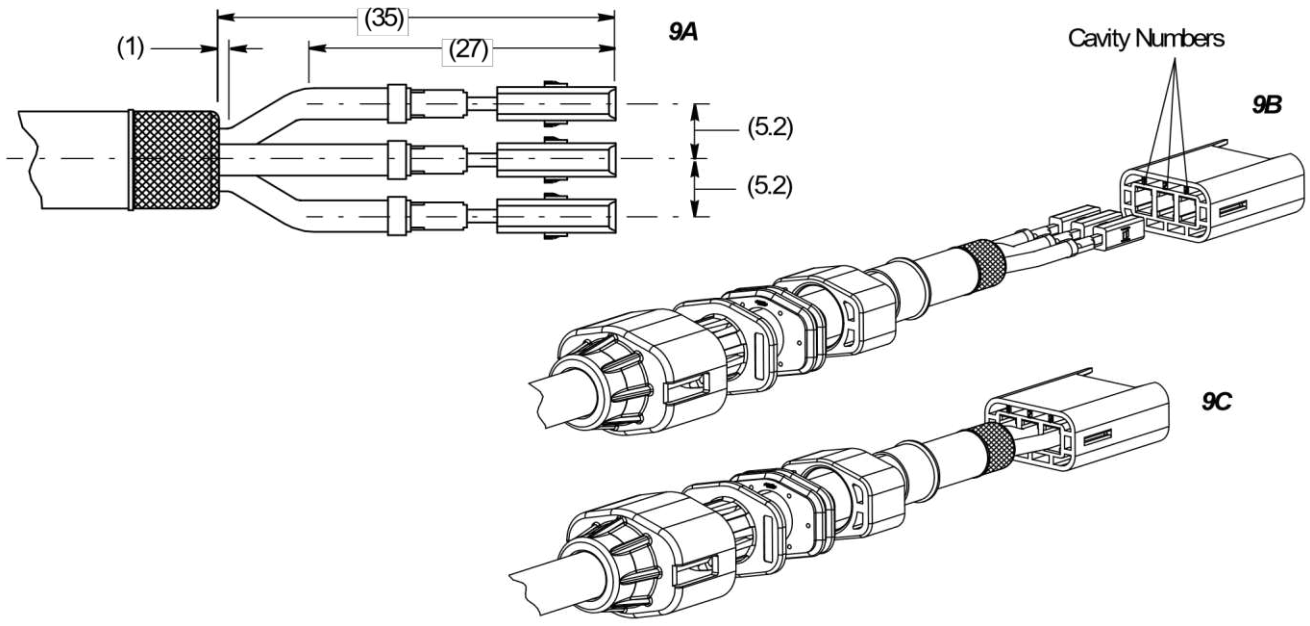


Figure 9

9. Assemble the first connector shield by positioning the inward facing shield tab in the positioning slot of the inner housing on the side as shown in Figure 10A. Do not completely lock the other side of this shield at this time. Position the wires away from the shield as shown in the top view of Figure 10A. Assemble the second shield by positioning the inward facing shield tab in the positioning slot of the inner housing on the side as shown in Figure 10B. Then rotate until the opposite side shield tab locks into place. Complete the shield assembly process by locking in the other shield tab of the first shield. Make sure the overlapping tabs in the shield transition and crimp areas are overlapping as shown in Figure 10C.

CAUTION
Wire insulation shall NOT be cut or broken during the shield assembly process.

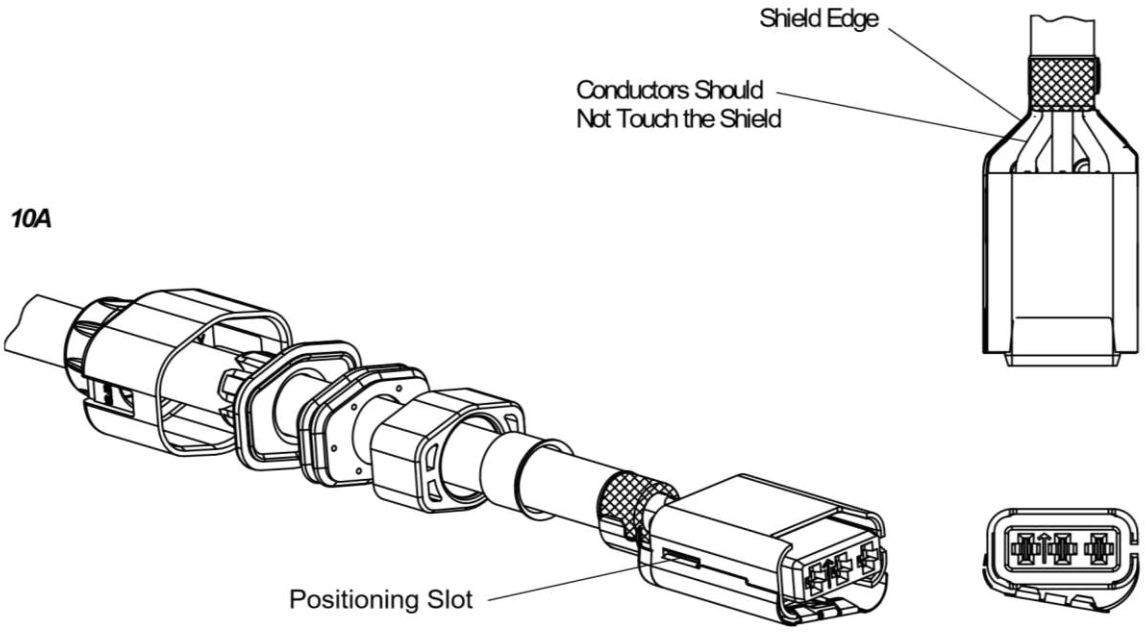


Figure 10 (Cont'd)

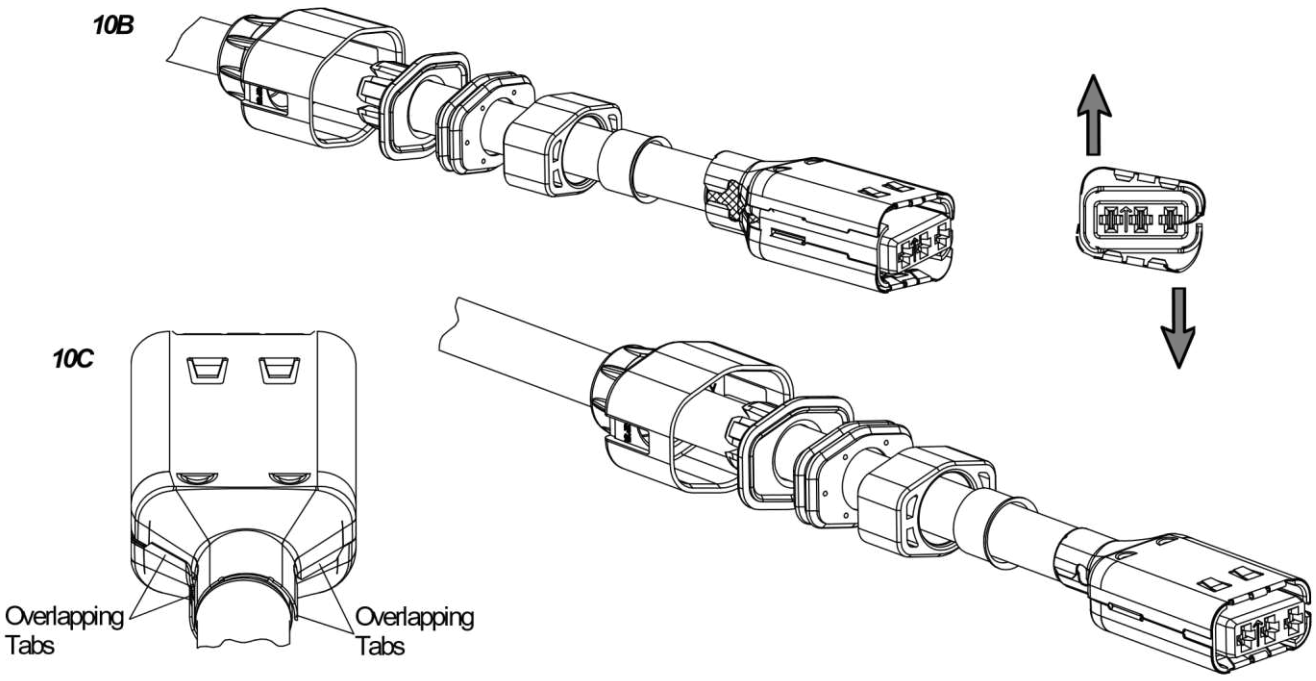


Figure 10 (End)

10. Slide the outer ferrule forward into position over the overlapping ends of the connector shields as shown in Figure 11.

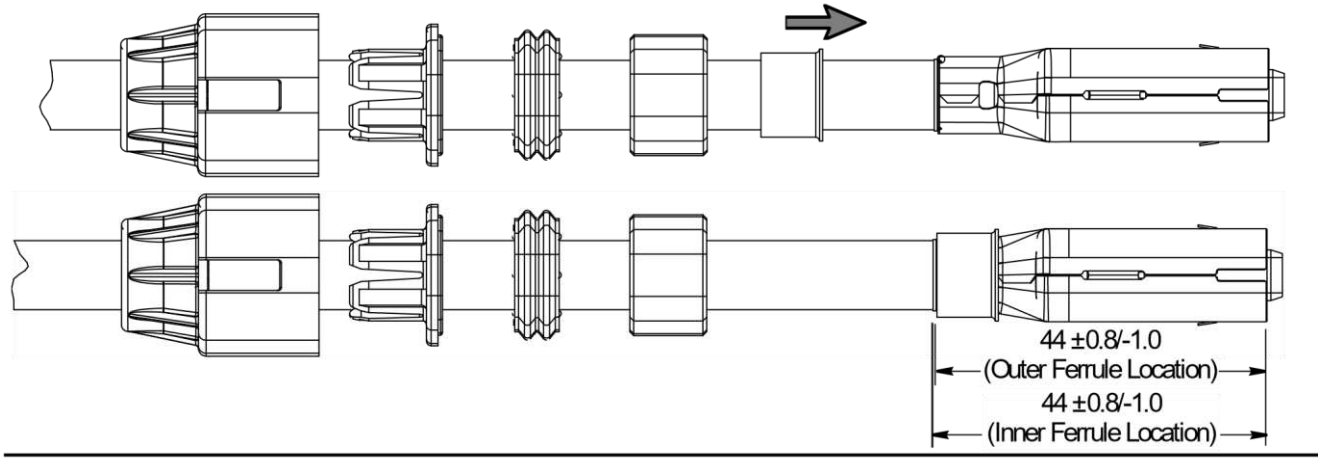


Figure 11

11. Crimp outer ferrule to the connector shields in the area shown in Figure 12 using hex crimp tooling as shown in Figure 25.

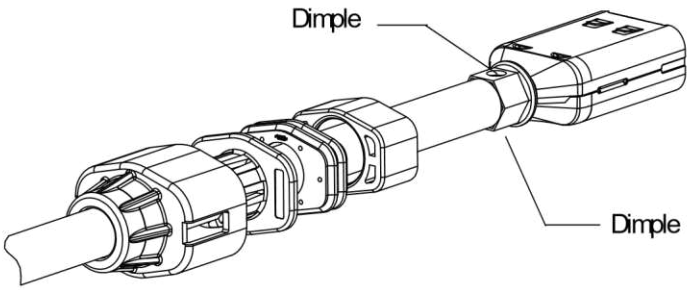
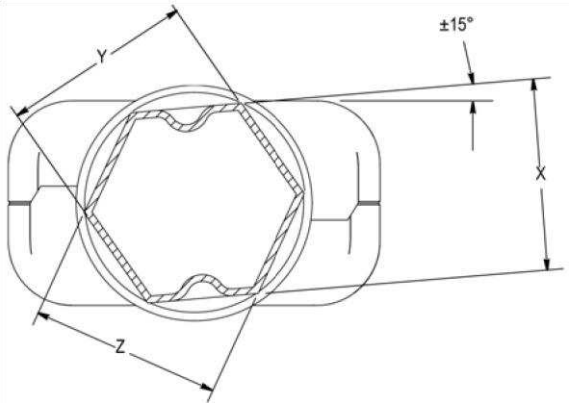


Figure 12

12. The following items at a minimum must be inspected and verified:

- Hex crimp dimensions per Figure 13
- No large burrs/flash on the ferrule crimp
- No visible cracking of the ferrule or shields
- No loose or detached braid strands
- The cable insulation in close proximity to the ferrule crimp is not pinched, abraded, or cut • The cable insulation is up against inner ferrule



CABLE	DIM X ±0.1	DIM Y	DIM Z
HITACHI (3X 2.5 mm^2) ECS-038	9.8	9.95 Max	9.95 Max
HUBER+SUHNER (3x 2.5 mm^2) 12 585 215 B or 84 132 059			
HUBER+SUHNER (2x 2.5 mm^2) 12 582 307 B			

Figure 13

13. Note the notch and arrow on the inner housing assembly and the rail on the plug assembly housing (Figure 14A). With the arrow facing the plug subassembly latch, insert the inner housing assembly into the plug subassembly until it is fully locked. Verify that the inner housing assembly is completely inserted as shown in Figure 14B by gently pulling back on the cable.

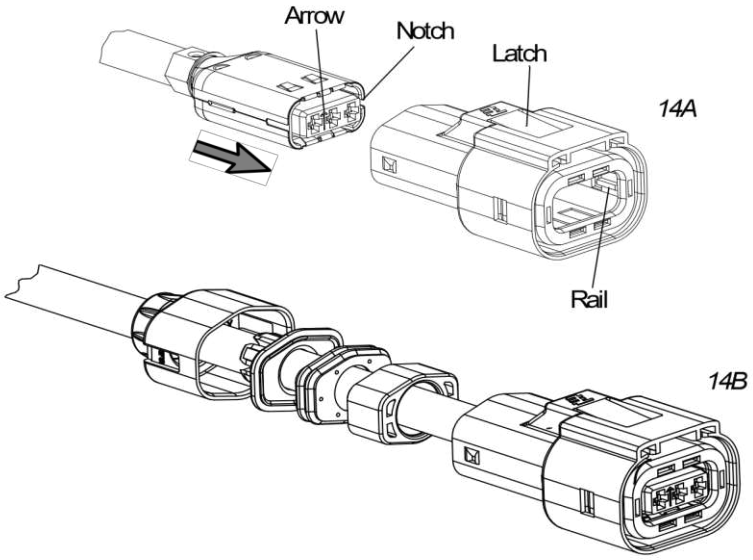


Figure 14

HUBER+SUHNER is a trademark.

14. Slide the spacer forward on the cable and into the cable exit end of the connector assembly until it stops against the inside of the connector outer housing as shown in Figure 15.

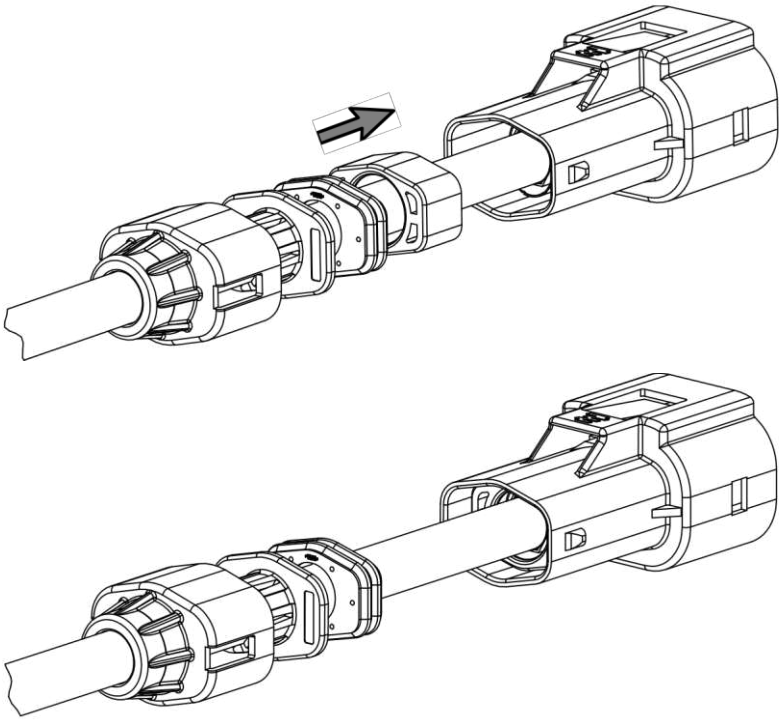


Figure 15

15. Slide the cable seal forward on the cable and into the cable exit end of the connector assembly until it stops against the spacer as shown in Figure 16.

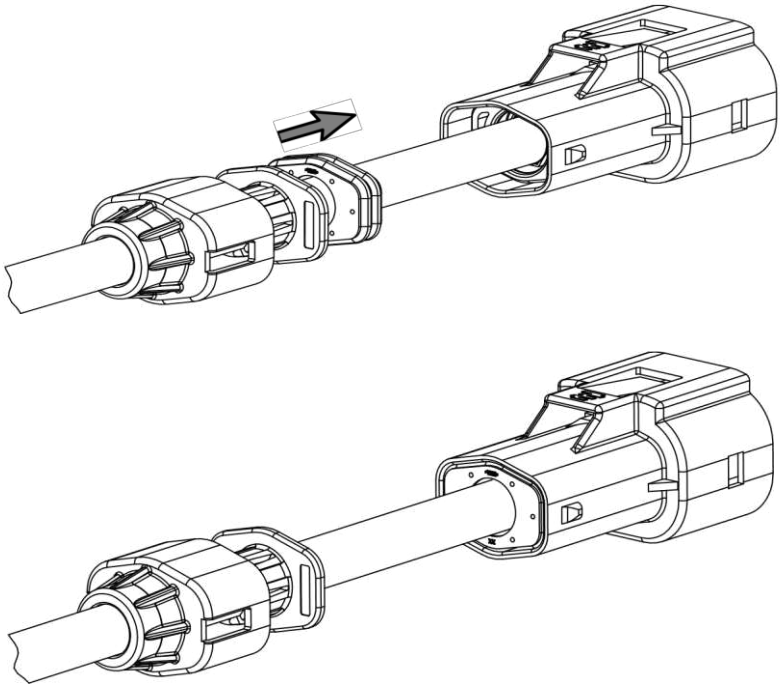


Figure 16

16. Slide the collet forward on the cable until it stops against the outer housing as shown in Figure 17.

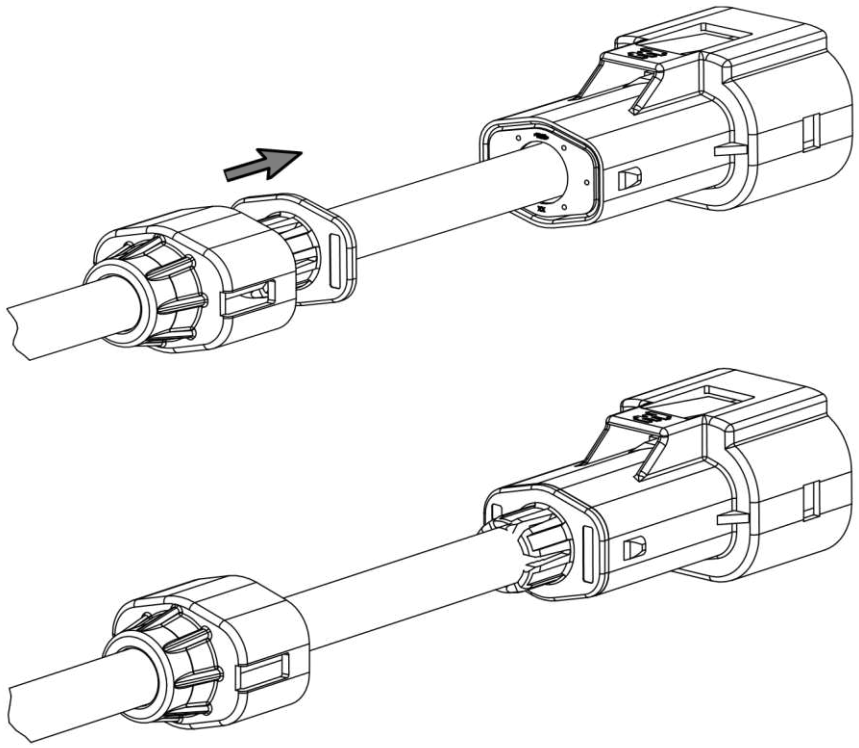


Figure 17

17. Slide the cable seal retainer forward on the cable and over the cable exit end of the connector assembly until it fully locks to the connector outer housing. Visually check to ensure that both locking features are engaged as shown in Figure 18. Gently pull back on the cable seal retainer to check that it is fully locked in place.

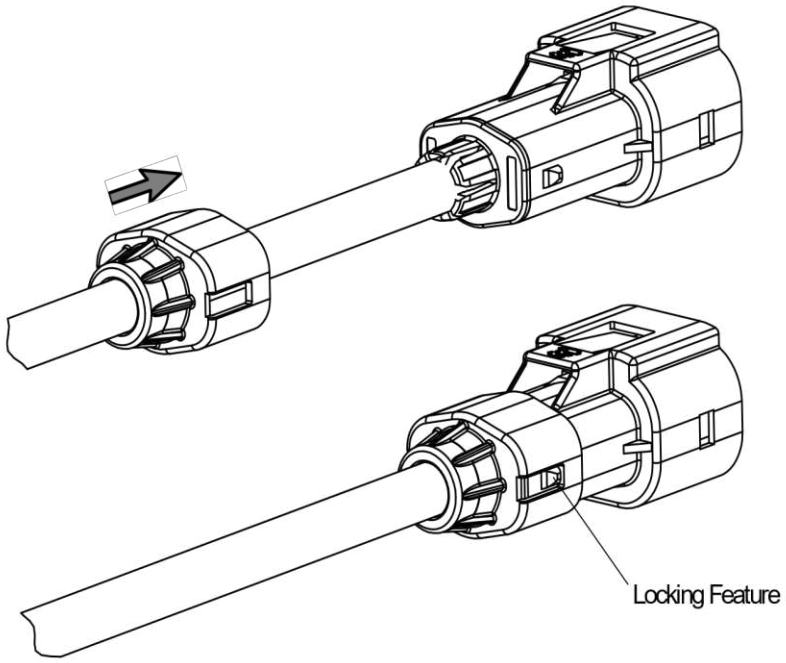


Figure 18

18. *Optional* - assemble the shipping cap into the plug assembly until it fully locks to the outer housing as shown in Figure 19. Gently pull back on the shipping cap to check that it is fully locked in place.

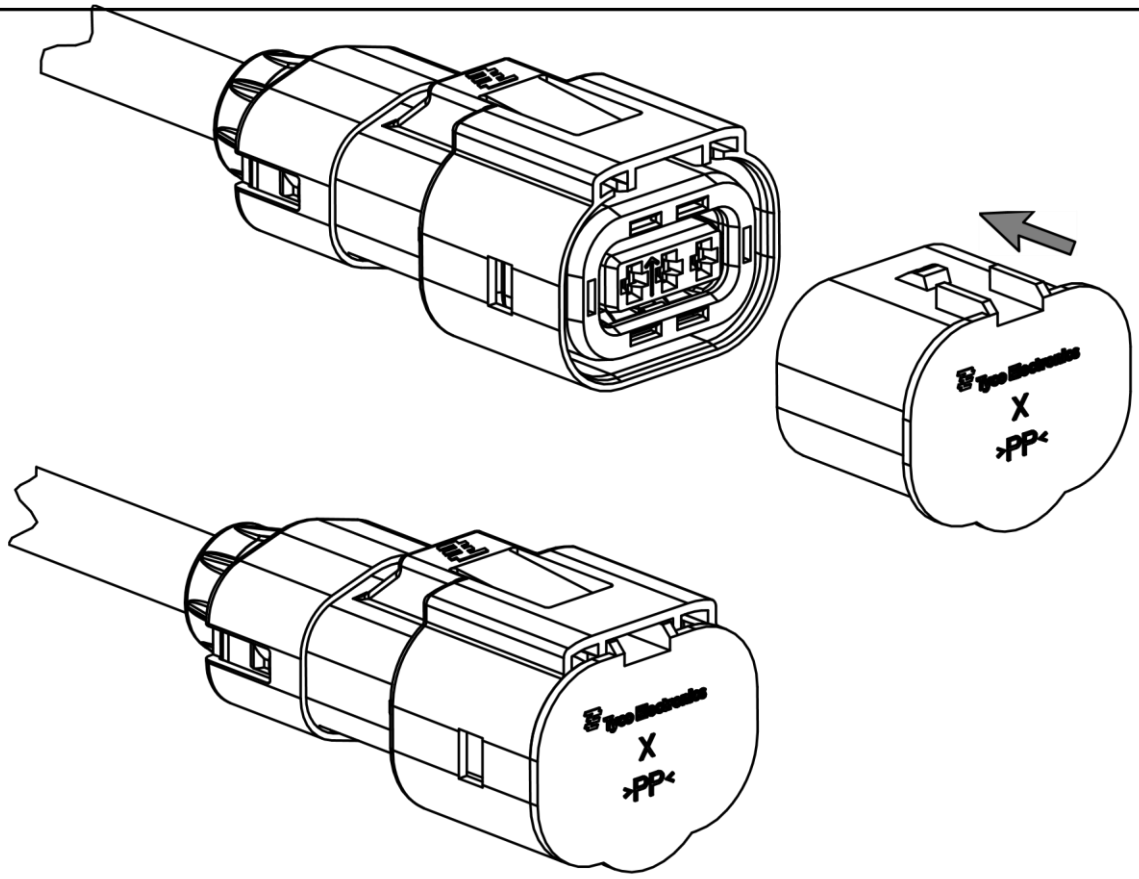


Figure 19

3.7. Contact Probing

CAUTION
Avoid probing the contact in an area that could damage the plating inside the receptacle contact. The best location for probing the receptacle contact is at the front as shown in Figure 20.

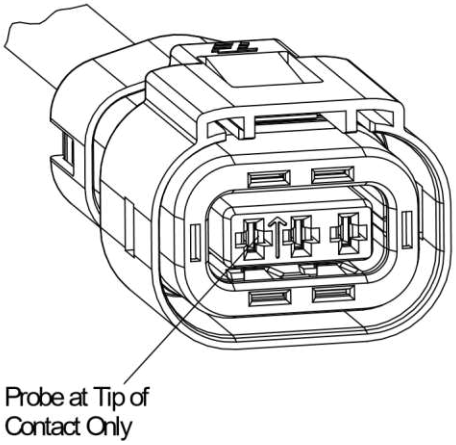


Figure 20

3.8. Connector Mating

The following procedures provide steps to mate the high-voltage plug assembly and header assembly. See Figure 21.

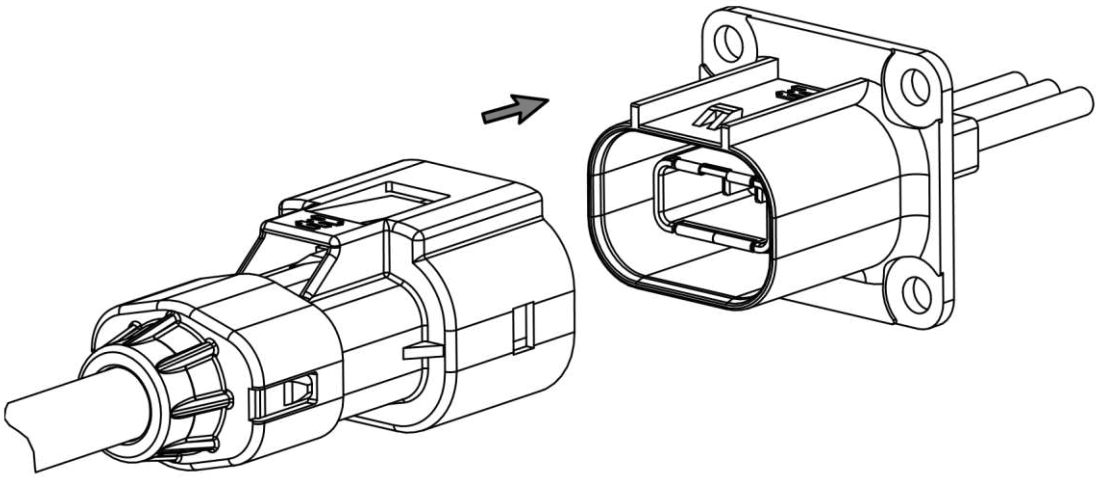


Figure 21

1. Push the AMP+ HVA280-3pxm plug assembly and header assembly together until the main latch engages with an audible and tactile click. See Figure 22. If the connector halves do not fit together easily, check the following:

- Keying options on the AMP+ HVA280 plug assembly matches the AMP+ HVA280 header assembly
- AMP+ HVA280 plug and header assemblies are correctly orientated (180°)

2. Pull lightly on the AMP+ HVA280 plug assembly to verify that the plug and header are fully latched. The connector system is now fully functional.

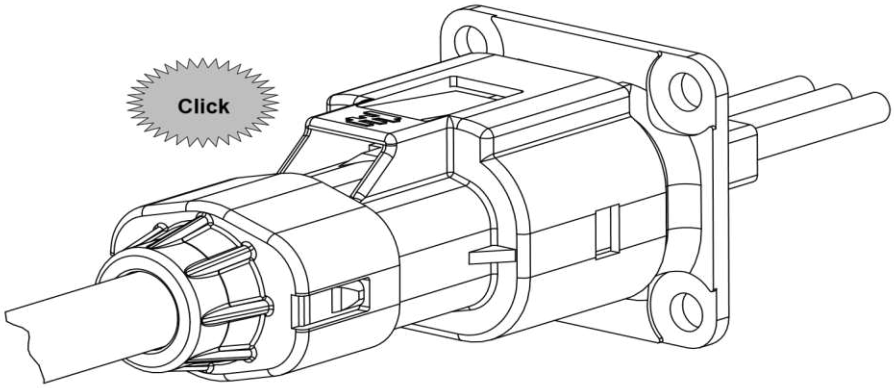


Figure 22

3.9. Connector Unmating

The following procedures provide steps to unmate the high-voltage plug assembly and header assembly.

DANGER
User must exercise extreme caution to verify high-voltage power is disabled before unmating.

1. Push a flat-bladed screwdriver straight into the latch opening in the back of the plug assembly. The screwdriver will act as a wedge between the latch and the AMP+ HVA280 plug assembly and the latch retention feature of the AMP+ HVA280 header.

CAUTION
Do NOT pry the latch.

2. At the same time, pull the AMP+ HVA280 plug assembly and header apart as shown in Figure 23. Do NOT pull on the cable or cable seal retainer.
3. The plug and header assemblies are now ready for servicing or mating.

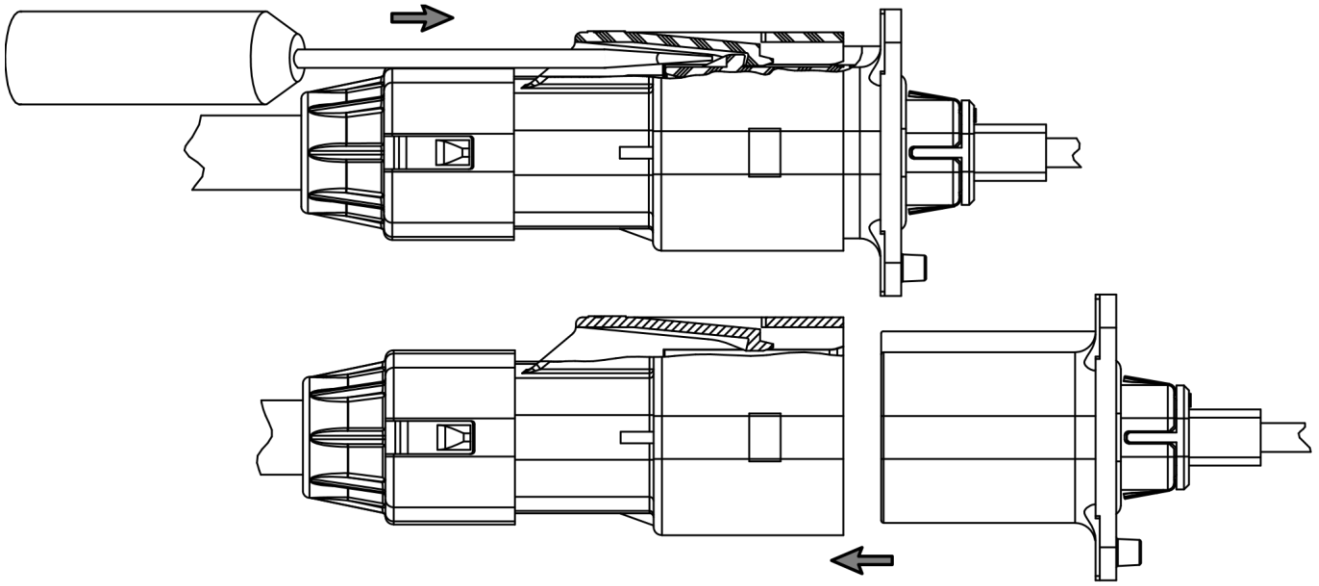


Figure 23

3.10. Cable Routing

Cable assembly should be restrained as shown in Figure 24.

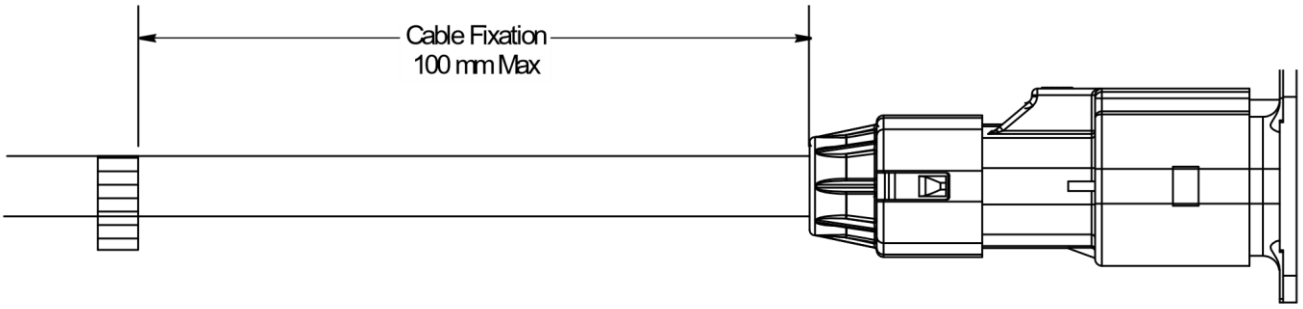


Figure 24

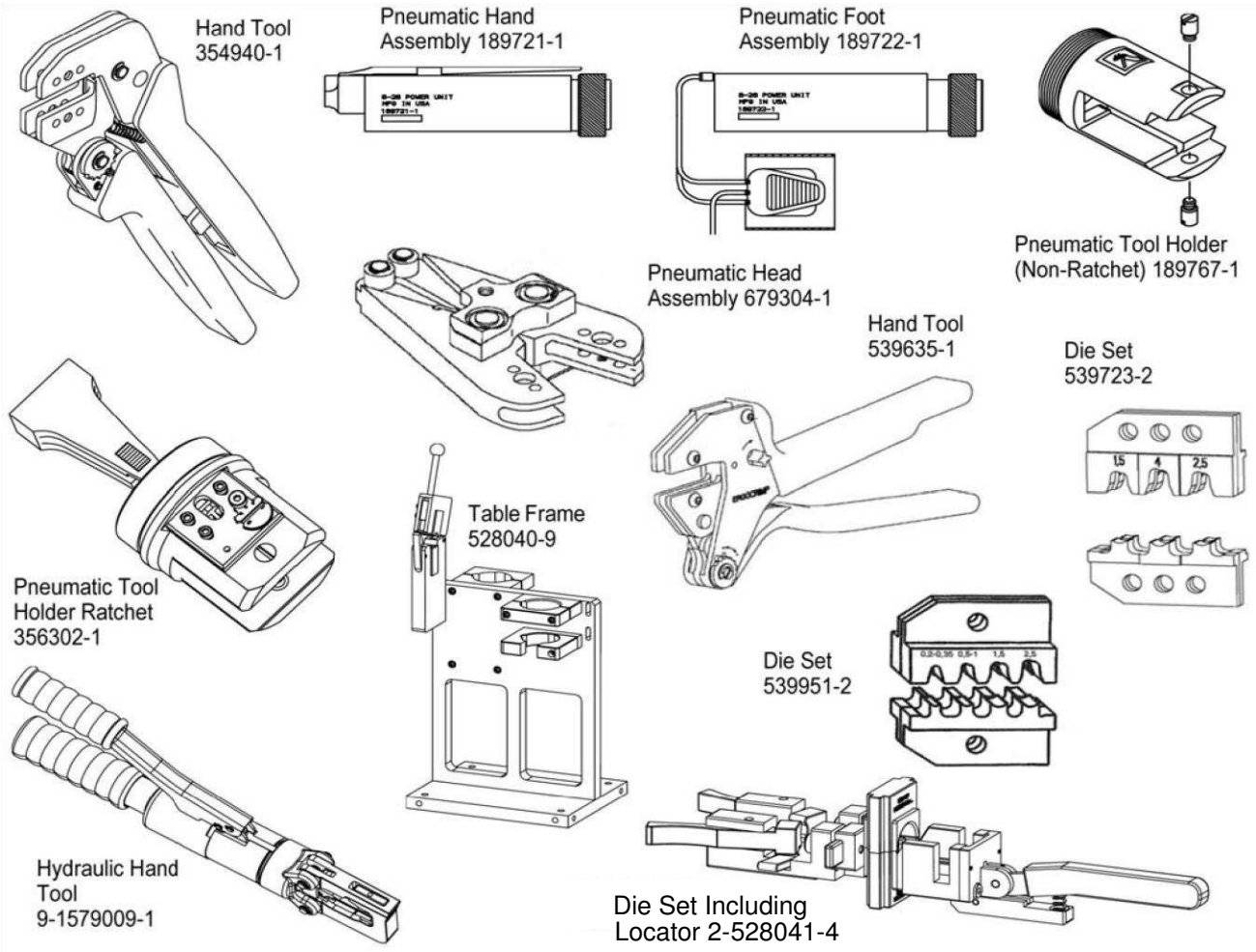
4. QUALIFICATIONS

The AMP+ HVA280 connector system has been validated to the following specifications:

- IEC 60529: Degrees of Protection Provided by Enclosures (IP Code)

5. TOOLING

A listing of tooling recommendations covering the full wire size range is provided in Figure 25. Modified designs and additional tooling concepts may be available to meet other application requirements. For additional information, contact one of the service groups at the bottom of page 1.



APPLICATION TOOLING FOR FERRULES (DOCUMENT)

CABLE	DIE SET	DIE SET 2	MANUAL TOOLING (408-9930)	PNEUMATIC TOOLING					HYDRAULIC TOOLING		
				HAND ASSY (408-2498) (409-5862)	FOOT ASSY (408-2498) (409-5862)	TOOL HOLDER			DIE SET INCLUDING LOCATOR	HAND ASSY PLIERS	TABLE FRAME FOR PLIERS
						RATCHET (408-4303)	NONRATCHET (408-2498)	HEAD ASSY (408-4070)			
HITACHI (3x 2.5 mm^2) ECS-038 HUBER+SUHNER (3x 2.5 mm^2) 12 585 215 B or 84 132 059 HUBER+SUHNER (2x 2.5 mm^2) 12 582 307 B	2063013-1	2393209-1	Hand Tool Frame Assy 354940-1	189721-1	189722-1	356302-1	189767-1	679304-1	2-528041-4	9-1579009-1	528040-9

APPLICATION TOOLING FOR 1-968851-3 RECEPTACLE CONTACTS

CONTACT TYPE	WIRE SIZE RANGE	HAND TOOL (411-18087)	DIE SET (411-18169)
Receptacle	2.5 mm²	539635-1	539723-2

APPLICATION TOOLING FOR 1241390-3 RECEPTACLE CONTACTS

CONTACT TYPE	WIRE SIZE RANGE	HAND TOOL (411-18087)	DIE SET (411-18138)
Receptacle	2.5 mm²	539635-1	539951-2

Figure 25

HUBER+SUHNER is a trademark.

6. VISUAL AID

The illustration below shows a typical application of this product. 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.

NOTE

Refer to Application Specification 114-18148-1 or 114-18387 for requirements for a correct terminated MCP 2.8 mm receptacle contact.

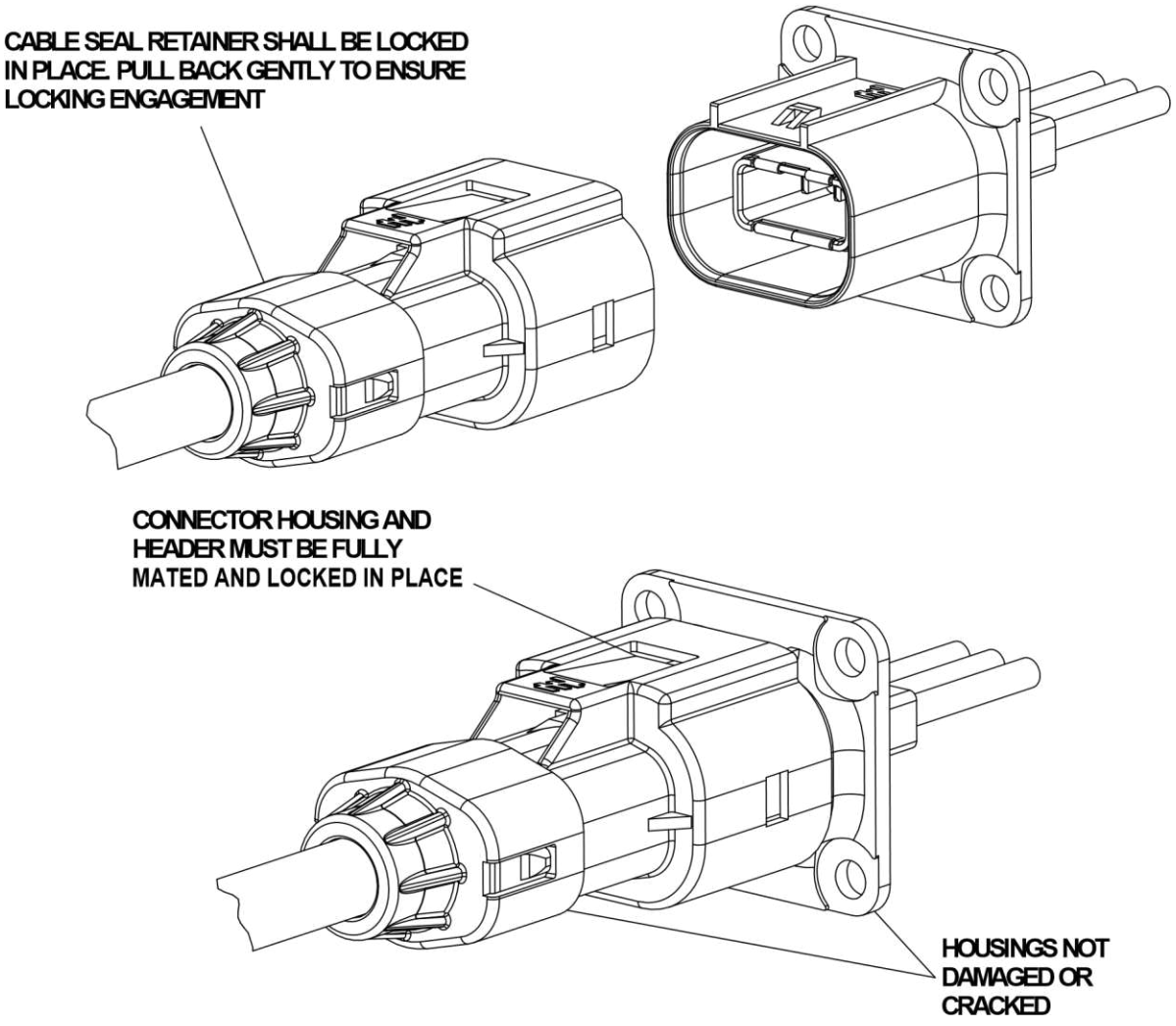


FIGURE 26. VISUAL AID