PREMIUM MANUAL HAND TOOLS

CERTI-CRIMP HAND TOOLS FOR OPTIMUM PERFORMANCE

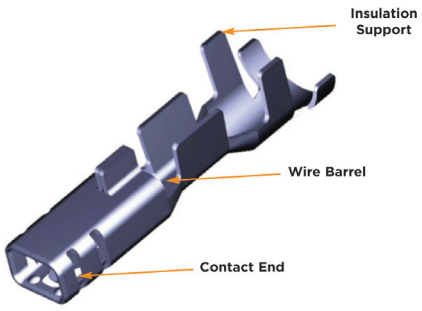
INTRODUCTION TO TOOLING SOLUTIONS

TE Connectivity. A Leader in Crimp Quality.

Anyone can make a tool to crimp terminals onto a wire. But not everyone can manufacture a tool to crimp the terminals properly. Crimp termination of wires isn't easy. At least, doing it right isn't easy. We know. We started it. TE Connectivity developed the technology of hand crimping over 70 years ago.

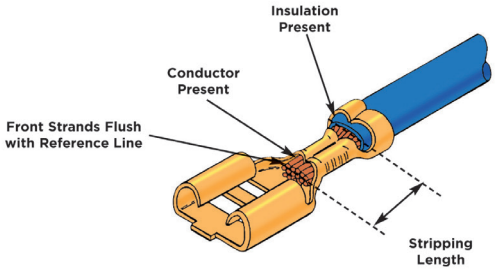
The Secret to a Successful Crimp.

Matching the Terminal to the Tooling - Among the many factors that are critical in producing a quality crimp, matching the terminal to the tooling is crucial. Unlike inferior tooling options, TE Connectivity offers engineered solutions that are designed to match the exact crimp geometry of the terminal to be applied on the wire. To create a proper crimp you need to follow these important steps:

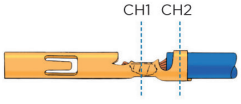


1. Wire Selection - AWG and wire insulation thickness varies from wire to wire. Just because two wires are listed at the same AWG, it doesn't mean their insulation thickness is the same. If you don't take into account both factors, the copper or aluminum strands may not fit in the wire barrel correctly or the terminal's insulation support may be too large or small for the wire strand.

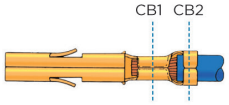
2. Wire Prep - In order to properly place a wire in a terminal, the wire insulation must first be stripped to the proper length based on the terminal specifications. If the insulation is cut too short or too long, the wire will not be seated properly into the wire barrel, causing terminal separations or shorting.



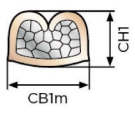
3. Crimp Specifications - To create a proper crimp for a TE connector or terminal you should use a TE Connectivity tooling solution that is specifically engineered to the proper Crimp Height, Width and Crimp Geometry of the selected terminal or contact.

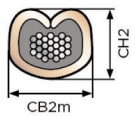


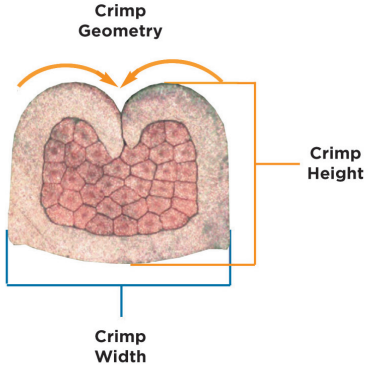
CH2: Insulation crimp height
CH1: Conductor crimp height



CB2m: Insulation crimp width
CB1m: Conductor crimp width







What You Need to Know About TE Hand Tools

Tool Grade

Tool grade is a prime consideration when choosing the appropriate tool for an application. Our hand tools are categorized into three levels: Service, Commercial and Premium. The higher the grade of the tool, the less operator skill is required to repeatedly meet the specified parameters of the crimp.

Premium (CERTI-CRIMP Tool)

Premium tools include the appropriate crimp die configuration, integral locating, and integral straightening features that permit terminals or contacts crimped in these tools to meet all feature requirements in applicable TEC application (114-) specifications. Most premium tools include an adjustable insulation crimp height feature and the CERTI-CRIMP ratcheting feature, set at the factory, which prevents the ratchet from releasing until the wire crimp jaws bottom within .001. This helps provide consistent repeatability of the crimp. Premium hand tools require the least amount of user dexterity.

Commercial (PRO-CRIMPER III Tool)

Commercial die assemblies are designed to meet the wire crimp height requirements per the applicable TEC application (114-) specifications. Other feature requirements may or may not be met. Commercial handle assemblies permit the interchange of die assemblies and an adjustable ratcheting feature. Users are responsible for adjusting the ratchet to obtain the correct crimp height. Commercial tools require a greater amount of user dexterity than premium crimp tools.

Service

Service tools are generally single thickness, stamped tools. They are not intended to meet any specifications and require a higher level of user dexterity to obtain acceptable results.

Tool Type

Choosing a tool type may be driven by several factors: simply by type preference, or by the application needs itself, i.e. heavy duty crimp, industry specification requirements, etc. The overall wire range is also a key consideration when choosing the appropriate tool for an application. Often there will be several tools referenced to the same product which have different wire ranges.

PREMIUM: MANUAL HAND TOOLING

Premium CERTI-CRIMP Hand Tools

FAST FACTS

- Designed to exacting specifications
- Ratchet control provides complete crimping cycle
- For most military, UL and CSA applications
- Manufactured using the highest quality materials
- Requires minimum skill
- Repairable
- Calibrated; recalibration recommended every 6 months or 5,000 cycles
- Many SAHT and DAHT crimping heads and many die sets can be adapted for use with the 626 pneumatic tool system (Request catalog # 124208)
- Produced under a quality management system certified to ISO 9001. (A copy of the certificate is available upon request.)

Consistent High Quality Terminations

CERTI-CRIMP hand tools are top-of-the-line, premium hand-operated tools for crimping a broad array of terminals, contacts and special wiring devices. They are designed to exacting specifications to produce consistent, high-quality terminations. A potential service life of over 50,000 cycles is possible, depending on operator care.

CERTI-CRIMP Tooling Options

There are currently seven basic styles of CERTI-CRIMP hand tools. The choice depends on the product being applied and/or your preferred method of application. For example, open barrel contacts typically require straight-action die movement to minimize possible rotation during crimping. Or, if your application requires crimping different sizes of terminals, you may prefer using a single tool with a combination of crimping nests rather than two or three separate tools.

Other options include insulation crimp adjustment for different insulation thicknesses, a locator for properly positioning and supporting the terminal or contact in the tool, a wire stop, and color-coding and/or wire size information on the head of the tool or on the handles.

Ratchet Control

All CERTI-CRIMP hand tools feature our reliable ratchet control system. The ratchet will not release until the handles are fully closed and the dies bottomed. This helps eliminate partial crimps.

CERTI-CRIMP hand tools are well suited for low production runs, prototype work, and repairs—almost any application requiring consistent, highly-reliable terminations.

Characteristics of a Premium Crimping Tool

Every CERTI-CRIMP hand tool incorporates features for optimum performance. They include locating, straightening, and insulation crimp adjustment features—quality options that sets TE apart from our competitors.

Crimp Designs—Optimum Performance

It's more than squeezing a terminal over a wire. Our crimp designs incorporate percent of compression that optimizes electrical and mechanical performance.

Bottoming Dies—Repeatable Performance

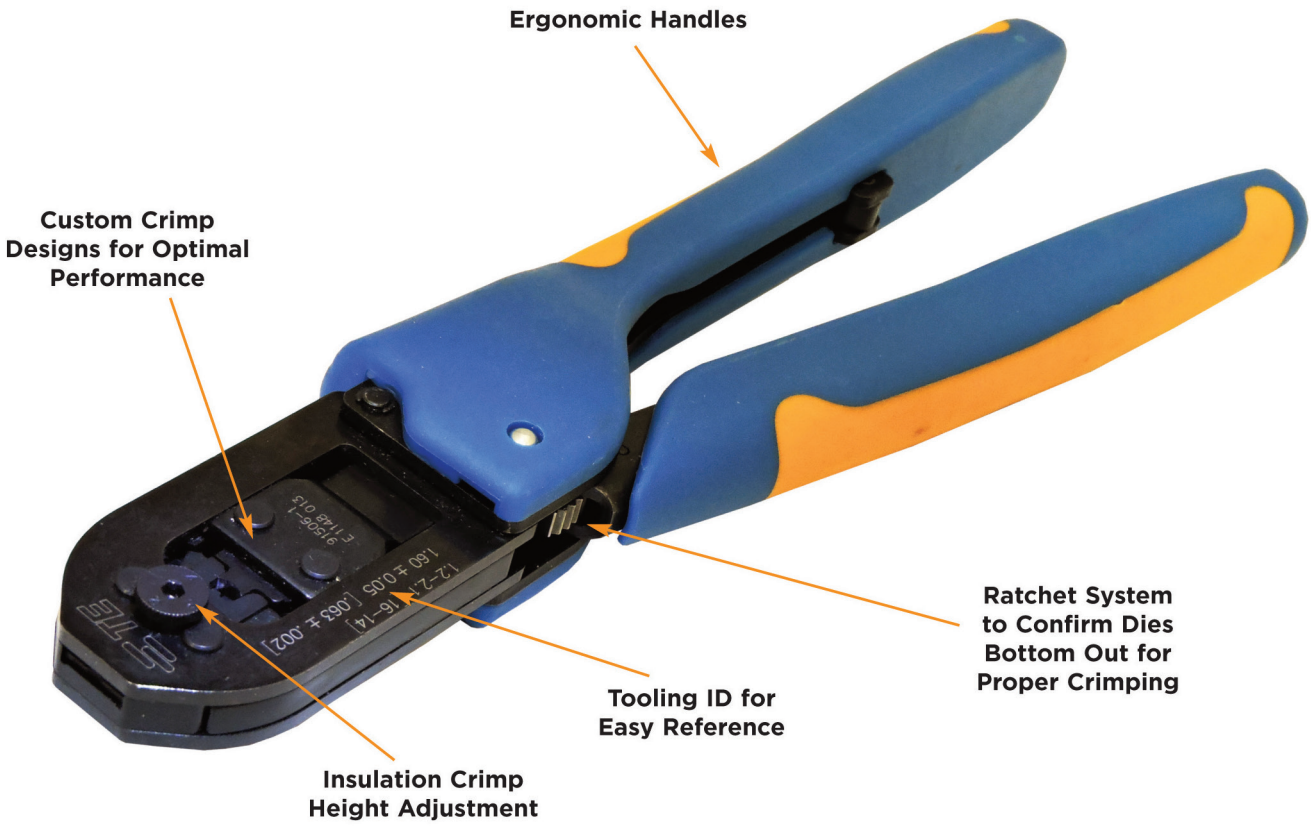
Repeatability in consistently reducing Circular Mil Area is the real measure of a crimp tool. The entire design of the tool—crimp form, force application, materials, and manufacturing tolerances—confirms that dies fully bottom, independent of operator technique or fatigue, or tool wear.

Applying the Crimp Force

Handle force is a key factor for any combination of hand tool, crimp die, terminal, and wire to crimp successfully. The design of the tool must take into account the crimp force requirement, as well as friction in the linkage and the need to bottom the dies. CERTI-CRIMP tools are set to specific handle pressures at our factory; a Certificate of Calibration allows tracking and performance verification.

Ratchet System to Improve Repeatability

The reliable ratchet system in all the CERTI-CRIMP tools is an aid to the operator, making sure the die bottoms before the tool opens. It complements the actual tool and die design in confirming crimp repeatability.



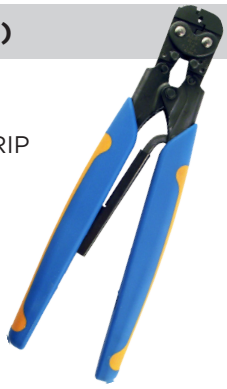
PREMIUM: MANUAL HAND TOOLING

CERTI-CRIMP Tooling Options

CERTI-CRIMP II Straight Action Hand Tool (SAHT)

- Dies close in a straight line
- Contact locator and support
- Wire stop
- Insulation crimp adjustment (4 positions)
- Ejects crimped contact
- Approx. weight 1.3 lb [0.59 kg]

Double Action Hand Tool (DAHT)



- Dies travel in arc-like path
- Locator on tools for FASTON, MATE-N-LOK, PIDG and PLASTI-GRIP terminals
- Insulation adjustment on tools for FASTON, MATE-N-LOK, PIDG and PLASTI-GRIP terminals
- Approx. weight 1.2 lb [0.54 kg]

T-HEAD Hand Tool (T-HEAD)

- Dies close in a straight line
- Locator
- Quick take-up on handle for holding terminal or splice in place
- Adjust insulation crimp with a 4-position screw
- Color-coded
- Approx. weight 1.3 lb [0.59 kg]

TETRA-CRIMP Hand Tool (TETRA) Part No. 59824-1

- Dies travel in arc-like path
- Multiple color-coded crimping cavities
- Terminal locator and wire stop
- Ratchet control release
- Approx. weight 1.4 lb [0.64 kg]

Platform Die Hand Tool (UFHT) Part No. 58078-3

- Same frame configuration as TETRA-CRIMP hand tool
- Dies are interchangeable
- Adjustable terminal locator
- Approx. weight 1.4 lb [0.64 kg]

Heavy Head Hand Tool (HHHT)

- Terminates most large coaxial cable and heavy-gage wire
- Dies close in a straight line
- Locator and wire stop when applicable
- Insulation adjustment on tools for AMPLI-BOND, PIDG and PLASTI-GRIP terminals
- Approx. weight 2.1 lb [0.95 kg]

C Head Straight Action Hand Tool Part No. 69710-1

- Dies close in a straight line
- Dies are interchangeable
- Locators and other applicable features included with dies
- Approx. weight 1.9 lb [0.86 kg]

Flip Locator for Premium CERTI-CRIMP II Hand Tools

FAST FACTS

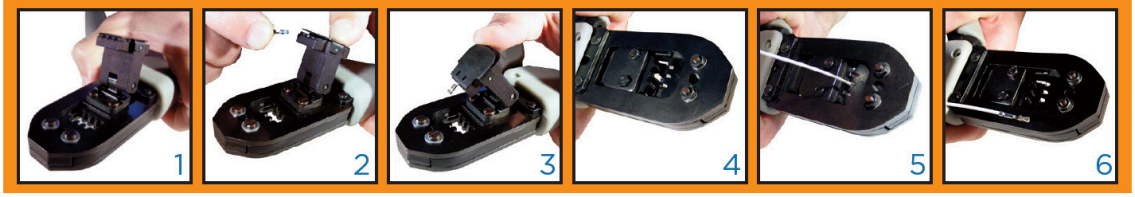
- Configured for CERTI-CRIMP II heads
- Accurately locates the terminal for a more consistent crimp termination
- Highly visible, easy to load terminal into locator
- Spring loaded retention feature
- Available with short and long handle tools

The flip locator on our CERTI-CRIMP II hand tool is designed to provide the ultimate in terminal placement accuracy, increased efficiency and ease of use.

Function

The new wire size trends have translated into new operator, tooling, and application challenges. Small terminal handling is a particular challenge as terminals continue to miniaturize. To address this challenge, the TE flip locator system allows the operator to flip the locator approx. 150 degrees, to provide for exact placement of small terminals. After loading, the locator is flipped back into position and the terminal is properly located automatically. Now, with the terminal held in place, the operator can concentrate on proper wire placement and complete the termination process.

Step-by-Step



LightKnack Accessory for CERTI-CRIMP Hand Tools

FAST FACTS

- High-intensity, long-life LED bulb
- Eases the termination process
- Magnetic for a secure placement while maintaining flexibility
- Applicable for any metallic tool surface
- Available separately in packs of 3
- Up to 8 hours of battery life
- Replaceable CR12166 batteries

This portable, magnetic LightKnack accessory is designed to provide light anywhere you need it.

How it works

Simply place the light on any magnetic surface, point the light to where light is needed and turn on the switch. The high-intensity LED provides hours of bright light onto the work surface. The magnets provide hands-free use.

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Tooling-to-Terminal Cross Reference

PREMIUM TOOLS

CERTI-CRIMP II Hand Tools (SAHT)

Double Action Hand Tools (DAHT)

T-HEAD Hand Tools (T-HEAD)

TETRA-CRIMP Hand Tool (TETRA)

ULTRA-FAST Hand Tool (UFHT)

Heavy Head Hand Tools (HHHT)

UNINSULATED TERMINALS

		Wire Range AWG	Wire Range mm²	Max. Insul.	Max. Dia.	Hand Tools Premium	Tool Type Premium
SOLISTRAND Terminals and Splices		22-16	0.3-1.25	—	—	49935	DAHT
		16-14	1.25-2	—	—	49935	DAHT
		12-10	3-5	—	—	49935	DAHT
		8	7	—	—	69355	HHHT

INSULATED TERMINALS

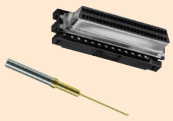
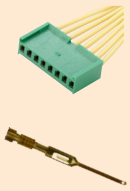
		Wire Range AWG	Wire Range mm²	Max. Insul.	Max. Dia.	Hand Tools Premium	Tool Type Premium
PIDG FASTON Receptacles (6409oo Series)		22-18	0.3-0.8	.100	2.54	59824-1	TETRA
		16-14	1.25-2	.170	4.32		
		12-10	3-5	.250	6.35		
PIDG Terminals and Splices, PLASTI-GRIP Terminals		26-22	0.12-0.3	.082	2.08	46121 59275	DAHT T-HEAD
		22-16	0.3-1.25	.125	3.18	47386 59824-1 59250	DAHT TETRA T-HEAD
		16-14	1.25-2	.150	3.81	47387 59824-1 59250	DAHT TETRA T-HEAD
		12-10	3-5	.230	5.84	59824-1 59239-4	TETRA HHHT
PLASTI-GRIP Butt Splices		26-22	0.12-0.3	.080	2.03	46121	DAHT
		22-16	0.3-1.25	.170	4.32	45160	DAHT
		16-14	1.25-2	.215	5.46	45575-1	DAHT
PLASTI-GRIP Terminals		8	7	.377	9.58	69959	HHHT

FULLY-INSULATED TERMINALS

		Wire Range AWG	Wire Range mm²	Max. Insul.	Max. Dia.	Hand Tools Premium	Tool Type Premium
Ultra-Fast Plus FASTON Receptacles		22-18	0.3-0.8	.135	3.43	58079-3*	UFHT
		16-14	1.25-2	.160	4.06	58080-3*	UFHT
Ultra-Fast FASTON Tabs and Receptacles		22-18	0.3-0.8	.230	5.84	90390-3*	UFHT
		16-14	1.25-2	.260	6.60	90391-3*	UFHT

* Die sets for Ultra-Fast hand tool frame PN 58078-3.

Tooling-to-Terminal Cross Reference

OPEN BARREL TERMINALS		Style	Wire Range AWG	Wire Range mm²	Max Insul.	Max Dia.	Hand Tools Premium	Tool Type Premium
AMPLIMITE D-Sub. Connectors		Size 20 DF Contacts	28-24	0.08-0.2	.040	1.02	91503-1	SAHT
			24-20	0.2-0.5	.060	1.52		
		Size 22 DF Contacts	28-22	0.08-0.3	.040	1.02	91520-1	SAHT
AMPMODU Connectors		Mod. IV Contacts	26-22	0.12-0.3	.061	1.55	91517-1	SAHT
			24-20	0.2-0.5	.069	1.75	91516-1	SAHT
		Locking Clip Contacts	26-22	0.12-0.3	.062	1.58	91533-1	SAHT
		MTE & Tandem Spring Contacts	32-28	0.03-0.08	.054	1.37	1901786-1	SAHT
			26-22	0.12-0.3	.065	1.65	91531-1	SAHT
		Short Point Contacts	32-22	0.03-0.3	.060	1.52	91518-1	SAHT
			24-20	0.2-0.5	.060	1.52	91551-1	SAHT
CPC Connectors, M Series Connectors		Type II Contacts	28-24	0.08-0.2	.055	1.40	91538-1	SAHT
			24-20	0.2-0.6	.062	1.57	91538-1	SAHT
			18-16	0.8-1.4	—	—	91538-1	SAHT
			14	2	—	—	91539-1	SAHT
		Type III+ Contacts	30-26	0.05-0.15	.060	1.52	91515-1	SAHT
			26-24	0.12-0.2	.055	1.40	91515-1	SAHT
			24-20	0.2-0.6	.080	2.03	91515-1	SAHT
			24-20	0.2-0.6	.100	2.54	91523-1	SAHT
			24-20	0.2-0.6	.120	3.05	91542-1	SAHT
			18-16	0.8-1.25	.100	2.54	91505-1	SAHT
			18-14	0.8-2	.100	2.54	91519-1	SAHT
		Type XII Contacts	16	1.25	.160	4.06	90382-2	HHHT
			14-12	2-3	.160	4.06	90382-2	HHHT
			10-8	5-7	.220	5.59	90384-1	HHHT
FASTON Straight Receptacles (Premier Line Only)		250 Series	22-18	0.3-0.8	.130	3.30	90166-1	DAHT
			18-14	0.8-2	.170	4.32	90165-1	DAHT
			14-10	2-5	.200	5.08	90120	DAHT
MATE-N-LOK Connectors		Commercial Contacts	30-22	0.05-0.3	.075	1.91	91515-1	SAHT
			24-18	0.2-0.8	.100	2.54	91512-1	SAHT
			20-14	0.5-2	.130	3.30	91504-1	SAHT
		Universal & Universal II Contacts	24-18	0.2-0.8	.100	2.54	91510-1	SAHT
			20-14	0.5-2	.130	3.30	91500-1	SAHT
			20-18	0.5-0.8	.200	5.08	91508-1	SAHT
			16-14	1.25-2	.200	5.08	91506-1	SAHT
		Mini-Universal	20-16	0.5-1.25	.126	3.20	91536-1	SAHT
		Mini-Universal II Contacts	26-22	0.12-0.3	.069	1.75	91529-1	SAHT
			22-18	0.3-0.8	.094	2.39	91522-1	SAHT
			20-16	0.5-1.25	.126	3.20	91594-1	SAHT

Insertion/Extraction Tools

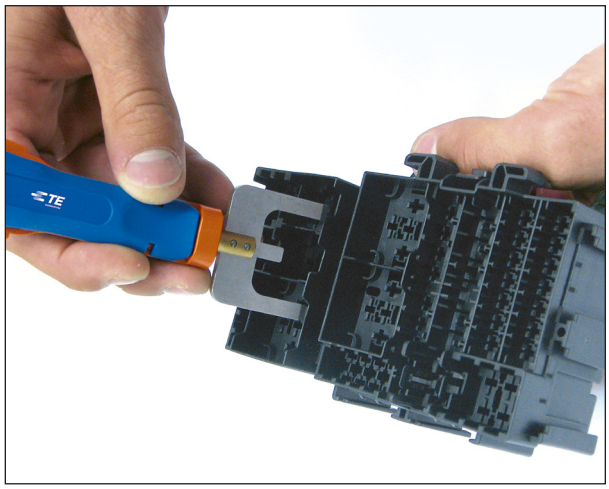
FAST FACTS

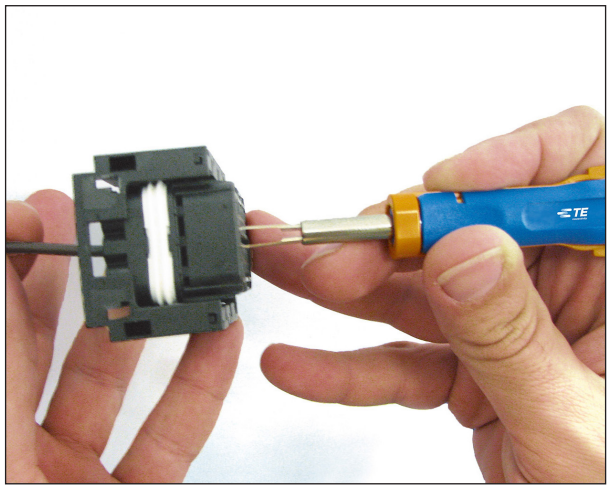
- Insertion / extraction tools are compatible with the vast majority of connectors used in most manufacturers' wiring harnesses
- Tool kits can be customized for further special requirements
- These tools are used not only for TE Connectivity products but also for those from other connector manufacturers

Insertion/extraction tools are used for inserting discrete terminals into connector housings or removing them, without causing damage to either the terminals or housings.

Our new standard design features a comfortable handle and snap-in/out protective cover that allows users to stow the business end of the tool to help protect from inadvertent personal injury when the tools are not in use.

Many different design types currently exist for our vast terminal product range, which we continue to convert. If you would like the tool you use converted to the new design, want a custom kit or tools in this design for other manufacturers' products – contact us, and where volumes permit, we will be pleased to provide you with a quotation for your requirement.





Insertion/Extraction Tools

Universal Handle, PN 465629-[ ]

* For universal handle (with adjustable strap) with short tip holder (1.87 [47.5]), specify -1 suffix; with long tip holder (5.87 [149]), specify -2 suffix.
  Requires installation tip: Part no. 465468-1 (> .185 [4.7] insul. dia. and/or crimp width) or Part no. 465488-1 (> .185 [4.7] insul. dia. and/or crimp width).

Insertion/Extraction Tool, PN 91285-1

The tool is designed to insert and extract HD-22 and HD-20 contacts used in AMPLIMITE high density (HD) Connectors.

Extraction Tool, PN 305183

Extraction Tools 1-305183-1 and 1-305183-2 are designed to remove contacts from MATE-N-LOK connectors. Tool 1-305183-1 is used for the pin contacts, and tool 1-305183-2 for the socket contacts.

Extraction Tool, PN 318851-1

Designed to remove MATE-N-LOK and Universal MATE-N-LOK II pin and socket contacts from the connectors.

Extraction Tool, PN 455822-2

For use with rectangular connector contacts.

Extraction Tool, PN 465644-1

For use in MATE-N-LOK rectangular connector contacts.

Extraction/Lance Reset Tool, PN 843996-3

These tools are designed to remove MTE, Mod IV, Tandem Spring, and Mini Tandem Spring contacts from housings and reset the overly depressed contact locking lances of the removed contact.

Let's Connect

To learn more about CERTI-CRIMP Premium Manual hand tooling or our comprehensive bundle of tooling solutions please visit us at **www.tooling.te.com**

TE Technical Support Center

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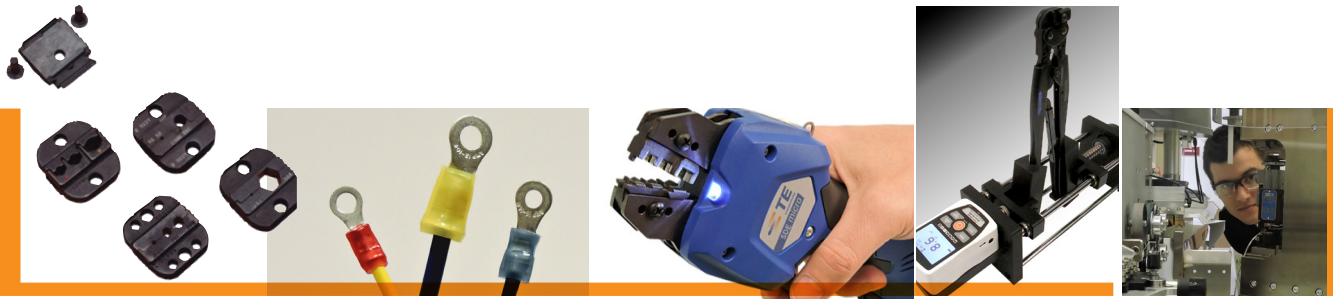
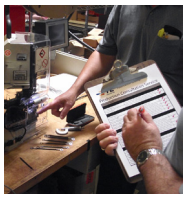


Add Power to Your Production.

If your production needs require fast, mobile hand tools that can help eliminate the hand fatigue from performing manual crimps, consider using TE's Lithium-Ion battery hand tools. Many of our Lithium-Ion battery powered hand tools utilize the same interchangeable die sets found in our Premium and Commercial hand tool lines, thereby speeding up your production capacity without the need for purchasing new die sets. For purchasing options go to www.tooling.te.com and search for catalog number **1-1773859-6**.



Waste Not. Want Not.

Whether it's time or scrap, in manufacturing everyone knows that waste costs money. With our on-site certification and consultation services, we can help you:

- Reduce downtime
- Reduce scrap
- Maintain crimp quality
- Improve manufacturing efficiency

Connect with us today to learn more.

- E-mail: fieldservicesnorthamerica@te.com
- Phone: **800-722-1111 or 717-986-3434**
- For additional information download catalog number **1-1307619-0** from www.tooling.te.com.

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