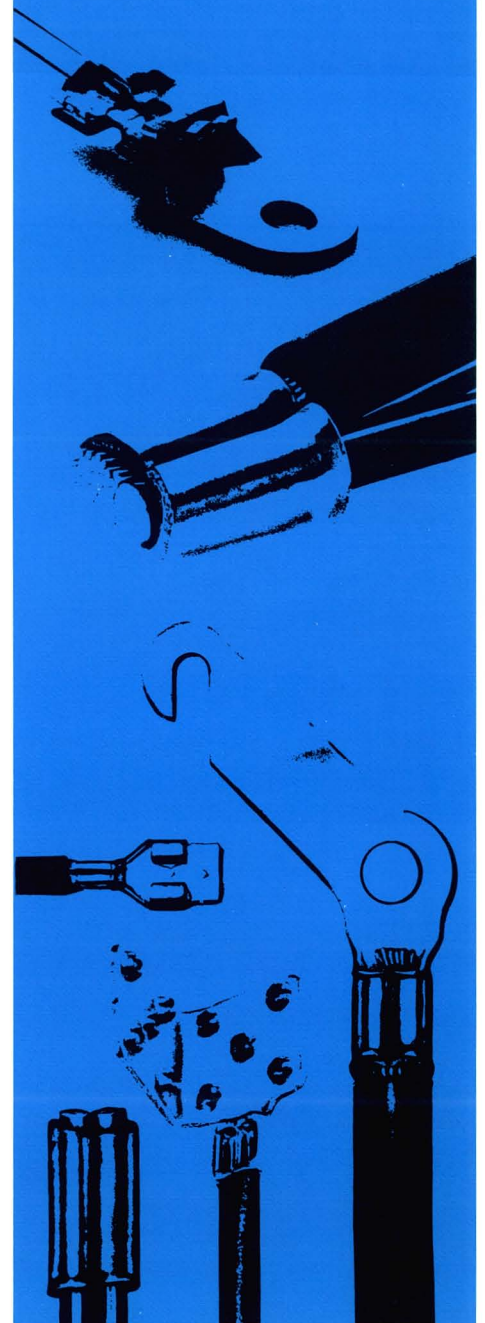


# 3

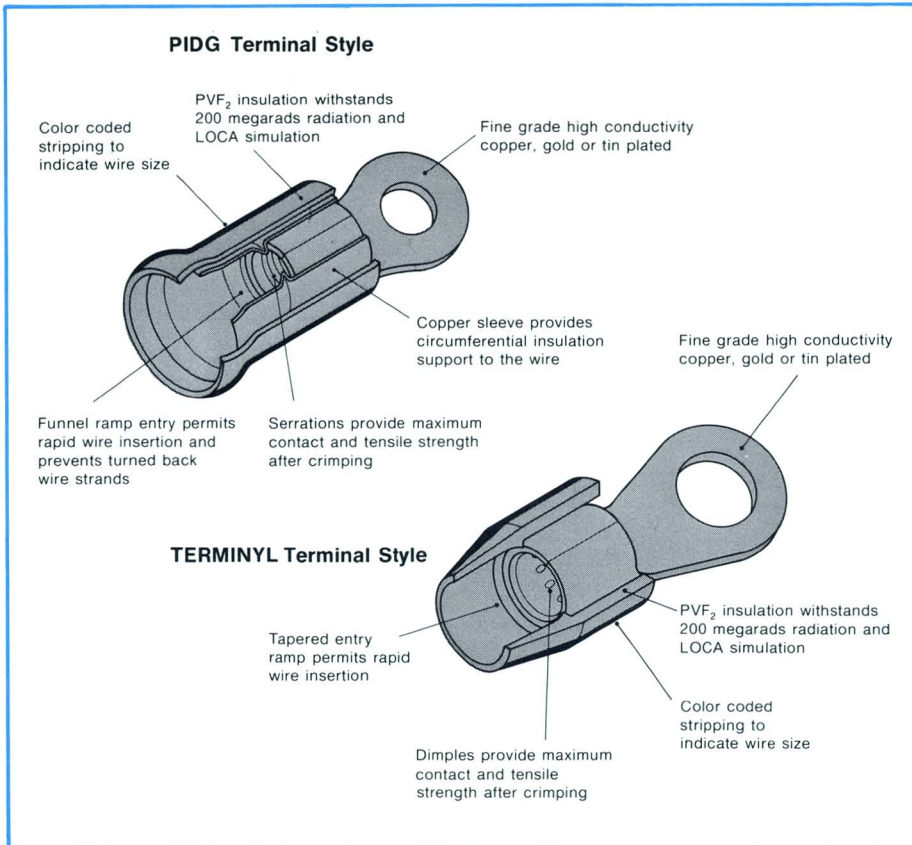
Loose piece terminals and splices designed to terminate aluminum and copper conductors, and to meet extreme conditions of vibration, mechanical stress, and other special termination requirements.

Terminals and Splices resistant to radiation and solvents.....	3-3
Radiation Resistant/150°C Pre-Insulated Terminals and Splices	
Terminals and splices for solid and stranded aluminum or copper wire .....	3-9
COPALUM Terminals and Splices	
Sealed terminals and splices for stranded aluminum wire.....	3-17
COPALUM Sealed Terminals and Splices	
Disconnect terminal for fine stranded aluminum wire.....	3-20
COPALUM Welding Cable Disconnect	
Large size open barrel terminals for aluminum and copper wire 8 through 2 AWG.....	3-22
Terminals and splices for use with aluminum foil.....	3-24
TERMI-FOIL Terminals and Splices	
Self-stripping splice .....	3-32
AMP ELECTRO-TAP Splice	

## TERMINALS & SPLICES FOR SPECIAL APPLICATIONS







### Radiation Resistant/150°C Pre-insulated Terminals and Splices

#### Features

- Designed to meet the requirements of MIL-T-7928
- Insulation of Polyvinylidene Fluoride (PVF<sub>2</sub>) for high radiation resistance (to 200 megarads)
- Withstands 4 days steam/chemical spray washdown which simulates LOCA (loss of coolant accident) conditions.
- Temperature Range -65°C to +150°C
- Uses standard PIDG & TERMINYL terminal tooling
- Color coded for easy wire and tool match
- Covers wide range of wire sizes—AWG 26-2/0
- Available in gold or tin plated versions for AWG 26-2 sizes
- Butt splice for wire sizes AWG 26-10

Note: All dimensions in inches

Specifications subject to change. Consult AMP Incorporated for latest design specifications.

The line of AMP Radiation Resistant/150°C Pre-insulated Terminals and Splices includes terminals and splices of the well-known PIDG terminal design, and terminals of the TERMINYL terminal design. Radiation Resistant terminals are available in bright tin and gold plated versions and feature polyvinylidene fluoride (PVF<sub>2</sub>) insulation for high resistance to radiation and solvents. These terminals were tested by AMP and by an independent test facility for conformance to MIL-T-7928F and fulfilled all requirements including radiation testing to 200 megarads, operating temperature range from -65°C to +150°C and resistance to steam and various chemical solvents to simulate LOCA (loss of coolant accident) conditions.

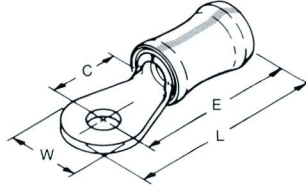
The Radiation Resistant/150°C terminals and splices feature the outstanding qualities of standard AMP terminal lines such as tapered entry ramps to help eliminate bent

wire strands, and insulation support for stronger, more reliable connections. Serrated or dimpled wire barrels provide maximum contact and tensile strength after crimping, and color coded insulation with wire size stamped on the tongue identifies the terminal and assists in proper terminal-wire match.

The Radiation Resistant/150°C terminals are designed and engineered to successfully withstand extreme vibration, shock and structural stresses, and other conditions which can adversely affect the critical circuit requirements in complex equipment.

The use of matching AMP tooling assures precision crimping which makes all terminations identical. This uniformity assures maximum reliability, and also serves as a built in quality control factor.

### Ring Tongue Terminals Wire Sizes 26-10



PIDG Terminal Style

**Materials:**

Terminal Body—Copper per QQ-C-576; Plating is Gold (.00005" min.) per MIL-G-45204 over Nickel (.00003" min.) per QQ-N-290 or Tin per MIL-T-10727.

Insulation Support Sleeve—Copper per QQ-C-476; Plating is Tin per MIL-T-10727  
Insulation Sleeve—PVF<sub>2</sub>, Natural Color

### Wire Range 26-24

**Wire Insulation Diameter:**  
.082" Max.  
**Terminal Tongue Material Thickness:**  
.027" ± .002"  
**Stripe Color Code:** Yellow  
**Tooling:** 22-16  
PIDG Tooling (Red Coding)

Stud Size	C Min.	W	E Max.	L Max.	Part Numbers			
					Gold Plate		Tin Plate	
					Tape Form	Loose Piece	Tape Form	Loose Piece
2	.211	.203	.632	.736	53400-4	53400-3	53400-2	53400-1
4	.211	.203	.632	.736	53401-4	53401-3	53401-2	53401-1
6	.243	.250	.664	.792	53402-4	53402-3	53402-2	53402-1
8	.250	.281	.671	.814	53403-4	53403-3	53403-2	53403-1
10	.281	.312	.702	.861	53404-4	53404-3	53404-2	53404-1

### Wire Range 24-20

**Wire Insulation Diameter:**  
.100" Max.  
**Terminal Tongue Material Thickness:**  
.023" ± .002"  
**Stripe Color Code:** White

0	.125	.160	.506	.589	—	—	53807-4	53807-1
1	.125	.160	.506	.589	—	—	53807-5	53807-2
2	.125	.160	.506	.589	—	—	53807-6	53807-3
4	.250	.203	.631	.735	—	—	53808-2	53808-1
4	.250	.281	.631	.774	—	—	53809-3	53809-1
6	.250	.281	.631	.774	—	—	53809-4	53809-2
8	.281	.312	.662	.821	—	—	53818-3	53818-1
10	.281	.312	.662	.821	—	—	53818-4	53818-2

### Wire Range 22-16

**Wire Insulation Diameter:**  
.125" Max.  
**Terminal Tongue Material Thickness:**  
.031" ± .002"  
**Stripe Color Code:** Red

4	.156	.218	.560	.672	53405-4	53405-3	53405-2	53405-1
6	.156	.218	.560	.672	53406-4	53406-3	53406-2	53406-1
6	.250	.250	.654	.782	53407-4	53407-3	53407-2	53407-1
8	.281	.312	.685	.844	53408-4	53408-3	53408-2	53408-1
10	.281	.312	.685	.844	53409-4	53409-3	53409-2	53409-1
1/4	.437	.469	.841	1.078	53410-4	53410-3	53410-2	53410-1
5/16	.437	.469	.841	1.078	53411-4	53411-3	53411-2	53411-1
3/8	.546	.531	.950	1.218	53412-4	53412-3	53412-2	53412-1
1/2	.530	.713	.934	1.293	—	—	—	53413-1

### Wire Range 16-14

**Wire Insulation Diameter:**  
.150" Max.  
**Terminal Tongue Material Thickness:**  
.031" ± .002"  
**Stripe Color Code:** Blue

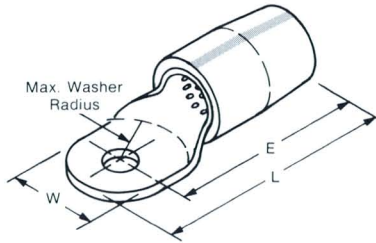
4	.171	.250	.575	.703	53414-4	53414-3	53414-2	53414-1
6	.171	.250	.575	.703	53415-4	53415-3	53415-2	53415-1
6	.281	.312	.685	.844	53416-4	53416-3	53416-2	53416-1
8	.281	.312	.685	.844	53417-4	53417-3	53417-2	53417-1
10	.281	.312	.685	.844	53418-4	53418-3	53418-2	53418-1
1/4	.437	.469	.841	1.078	53419-4	53419-3	53419-2	53419-1
5/16	.437	.469	.841	1.078	53420-4	53420-3	53420-2	53420-1
3/8	.546	.531	.950	1.218	53421-4	53421-3	—	53421-1
1/2	.530	.713	.934	1.293	—	—	—	53422-1

### Wire Range 12-10

**Wire Insulation Diameter:**  
.230" Max.  
**Terminal Tongue Material Thickness:**  
.040" ± .002"  
**Stripe Color Code:** Yellow

6	.302	.375	.893	1.083	53423-4	53423-3	53423-2	53423-1
8	.302	.375	.893	1.083	53424-4	53424-3	53424-2	53424-1
10	.302	.375	.893	1.083	53425-4	53425-3	53425-2	53425-1
1/4	.468	.531	1.054	1.322	53426-4	53426-3	53426-2	53426-1
5/16	.468	.531	1.054	1.322	53427-4	53427-3	53427-2	53427-1
3/8	.531	.593	1.115	1.414	—	53428-3	—	53428-1
1/2	.474	.715	1.054	1.414	—	—	—	53429-1

Ring Tongue  
Terminals  
Wire Sizes  
8-2/0



**Materials:**

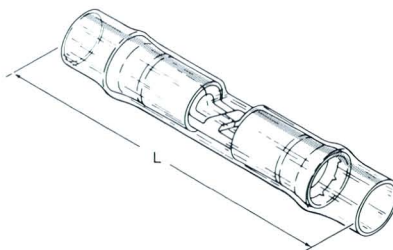
Terminal Body—Copper per QQ-C-576; Plating is Gold (.00005" min.) per MIL-G-45204 over Nickel (.00003" min.) per QQ-N-290 or Tin per MIL-T-10727.

Insulation Sleeve—PVF<sub>2</sub>, Natural Color

**TERMINYL Terminal Style**

Wire Size	Stripe Color Code	Wire Ins. Dia. Max.	Tongue Thickness	Stud Size	Max. Washer Rad.	W	E Max.	L Max.	Loose Piece Part No.	
									Gold	Tin
8	Red	.257	.040 ±.003	10	.437	.431	1.183	1.402	53504-1	53504-2
				1/4	.437	.478	1.183	1.425	53505-1	53505-2
				5/16	.500	.587	1.246	1.542	53506-1	53506-2
				3/8	.500	.587	1.246	1.542	53507-1	53507-2
6	Blue	.314	.045 ±.003	10	.421	.468	1.338	1.575	53508-1	53508-2
				1/4	.515	.500	1.447	1.700	53509-1	53509-2
				5/16	.515	.625	1.447	1.762	53510-1	53510-2
4	Yellow	.382	.048 ±.003	10	.531	.546	1.536	1.812	53511-1	—
				1/4	.531	.546	1.536	1.812	53512-1	53512-2
				5/16	.531	.679	1.536	1.878	53513-1	53513-2
2	Red	.473	.057 ±.003	10	.531	.679	1.536	1.878	53514-1	53514-2
				1/4	.578	.675	1.705	2.045	53515-1	53515-2
				3/8	.578	.711	1.705	2.063	53516-1	53516-2
1/0	Blue	.578	.070 ±.003	1/2	.578	.855	1.705	2.135	53517-1	53517-2
				1/4	.625	.807	2.033	2.426	—	53800-1
				3/8	.625	.807	2.033	2.426	—	53801-1
2/0	Yellow	.610	.080 ±.003	1/2	.625	.875	2.039	2.454	—	53802-1
				5/16	.625	.926	2.026	2.416	—	53803-1
				3/8	.625	.926	2.026	2.416	—	53804-1
				1/2	.625	.926	2.026	2.416	—	53805-1

Butt  
Splices  
Wire Sizes  
26-10



**Materials:**

Splice Body—Copper per QQ-C-576; Plating is Tin per MIL-T-10727.

Insulation Support Sleeve—Copper per QQ-C-576; Plating is Tin per MIL-T-10727

Insulation Sleeve—PVF<sub>2</sub>, Natural Color

**PIDG Butt Splice Style**

Wire Range	Stripe Color Code	Wire Ins. Dia. Max.	L Max.	Part Number
26-22	Yellow	.082	.859	53546-1
24-20	White	.100	.968	53547-1
22-16	Red	.125	1.265	53548-1
16-14	Blue	.150	1.265	53549-1
12-10	Yellow	.220	1.656	53550-1

Selection of Proper Tooling

AMP-TAPEMATIC Tools and Dies for Wire Range 26-10

The table below lists by wire size the types of packaging available and the quantity per package for each AMP-TAPEMATIC tool.

Tool No.	Wire Size	Quantity and Type Package
69359-2	# 26-14	1,000-box
69370	# 12-10	500-box
69118-1	# 26-14	100-box
69875	# 26-14	5,000-reel 24" dia. 1,000-box
	# 12-10	2,500-reel 24" dia. 500-box
68075*	# 26-14	2,500-reel 17" dia.
	# 12-10	1,500-reel 17" dia.
	# 26-16	1,000-box
	# 12-10	500-box

\* If box packaging is desired, a box holder, part number 305671, is required and must be purchased separately.

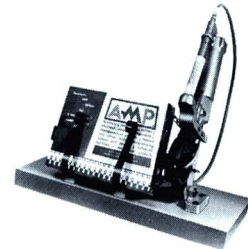
**NOTE:** Other items can be supplied in tape-mounted form. Consult AMP for information on special orders.

AMP application tools are designed to produce a carefully controlled, uniform pressure crimp whether manually or pneumatically powered. All tools feature matching dies that fully "bottom" at the completion of the crimp, thereby assuring proper crimp height. In the hand tools, this is accomplished by the AMP CERTI-CRIMP ratchet device located between the tool handles; bottoming is part of the automatic crimping

cycle of pneumatic tools. To aid in matching tool to wire size, AMP has provided positive identification in the form of color-coded dots on the crimping dies and color-keyed, insulated handles. All the tools shown on these pages are specifically designed for AMP Products and are precision machined for AMP's exclusive one-crimp termination of terminals or splices.



69118-1—  
Pneumatic  
Hand Tool  
(Portable)



69359-2—  
Pneumatic  
Bench Tool



69370—  
Pneumatic  
Bench Machine



68075—  
Electric/Air  
Bench Machine



69875—  
Electric Machine

Wire Range	Dies for 69118-1	Dies for 69359-2	Dies for 69370	Dies for 68075	Dies for 69875
24-20	69341	69341	69351	69878	69878
26-24 & 22-16	45185-7	45185-7 45185-8*	45185-6	69872	69872
16-14	45225-7	45225-7	45225-6	69873	69873
12-10	—	45228-5	45228-4	69874	69874

\* For wires with thin wall insulation.

Loose Piece Terminal and Splice Tooling for Wire Range 26-10



Long Handle Tool

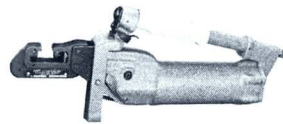
Wire Range	Tool No.
24-20	47907-1
26-24 & 22-16	47386
22-16	69151-1*
16-14	47387
16-14	69152-1*

\* For wires with thin wall insulation.



Short Handle Tool

Wire Range	Tool No.
24-20	47907
26-24 & 22-16	47386-2
16-14	47387-2



69365 Pneumatic Tool

Wire Range	Dies
24-20	69342
26-24 & 22-16	47806-2
16-14	47807-1
12-10	47808-6



Heavy Head Tool

Wire Range	Tool No.
12-10	59239-4 69150-1*

\* For wires with thin wall insulation.



T-HEAD Tool

Wire Range	Tool No.
24-20	59275
26-24 & 22-16	59250
16-14	59250
24-20	59300
26-24 & 22-16	59300

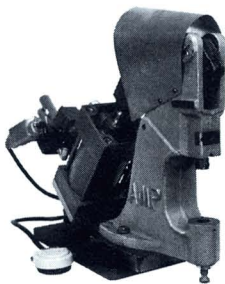


46110 Pneumatic Tool

Wire Range	Dies
24-20	69342
26-24 & 22-16	47806-2**
16-14	47807-1**

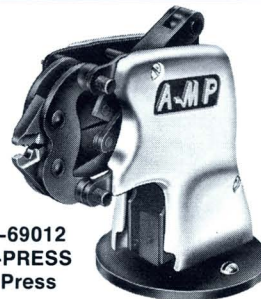
NOTE: This tool is not to be used for crimping splices.

\*\* Max. tongue width of terminals for use with these dies is 15/32 when used in Tool 46110. Flat tongues only.



69004 Pneumatic Press

Wire Range	Dies
26-24 & 22-16	47451
16-14	47452
12-10	47453



69011-69012 AMPLI-PRESS Bench Press

Wire Range	Heads for 69011	Heads for 69012
26-24 & 22-16	47498	46283
16-14	47499	46285
12-10	-	47500-1



69005-69010 Pneumatic Tool

Wire Range	Heads for 69005	Heads for 69010
26-24 & 22-16	47516	46282
16-14	47517	46284
12-10	-	47518-1

**DYNA-CRIMP Tooling**

**Loose Piece Terminal Tooling for Wire Range 8-2/0**

**Foot Operated Tool**

Handles the 8 to 2/0 radiation resistant terminal range. These tools are designed for intermittent service on location where outside power sources are not available. Heads and dies for these terminals are listed below. Heads and dies are available for other types of AMP terminals in wire ranges from 8 to 1000 MCM.



69325 Includes 7' hose  
69325-1 Includes 15' hose

**Accessory Power Controls and Hoses for Tool No. 69120**

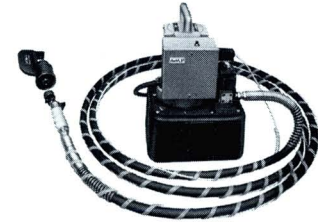
Control and Hose Accessories must be ordered separately. If tool is to be used in portable applications, a Handle Control and Hose Assembly should be used.

If the Tool is to be used in stationary applications, a Foot Switch Assembly, Crimping Head Coupling and Hose Assembly will be necessary.

Multi-Directional Valves are used when more than one Crimping Head is permanently attached to the Crimping Tool.

**Electric Hydraulic Tool**

Provides electric hydraulic powered crimping of radiation resistant terminals in wire ranges of 8 to 2/0. Heads and dies for these terminals are listed below. Heads and dies are available for other types of AMP terminals in wire ranges from 8 to 1000 MCM. Consult the Accessory Power Controls and Hoses Table below for complete accessory listing.



Part Numbers for power unit only  
 Pressure Release on unit only  
 115 volts—69120-1    230 volts—69120-2    220 volts—1-69120-0  
 Unit for use with pressure release handle control (Also includes pressure release on unit)  
 115 volts—69120-9    230 volts—69120-7

**Hand Hydraulic Tool**

Offers tooling for wire sizes 8 through 2 AWG where compactness and lightweight portability are mandatory. Dies for this tool are listed below under, "Dies for Head No. 69051."



69061 Hand Hydraulic Tool  
(Includes Crimping Head)

**Crimping Heads and Dies for Tools 69120, 69325 and 69061**

Wire Size	Dies for Head No. 69066	Dies for Head No. 69051*
8	—	47820
6	—	47821
4	—	47822
2	—	47823
1/0	47824	—
2/0	47825	—

\*Crimping Head is included with Hand Hydraulic Tool No. 69061. Order tool and dies only for complete crimping unit.

Number	Description	
59512-5	7' Handle Control Assembly—Hose and Cord	} Pressure Release on Power unit
59512-6	15' Handle Control Assembly—Hose and Cord	
59512-7	21' Handle Control Assembly—Hose and Cord	
59512-9	21' Handle Control Assembly—Cord (Less Hose)	
1-59512-5	28' Handle Control Assembly—Hose and Cord	
1-59512-3	7' Handle Control Assembly—Hose and Cord	} Pressure Release Handle
1-59512-2	15' Handle Control Assembly—Hose and Cord	
1-59512-0	15' Handle Control Assembly—Cord (Less Hose)	
1-59512-1	21' Handle Control Assembly—Hose and Cord	
1-59512-6	21' Handle Control Assembly—Cord (Less Hose)	
303775	7' Foot Switch Assembly (needs hose assembly)	
303776	15' Foot Switch Assembly (needs hose assembly)	
303777	21' Foot Switch Assembly (needs hose assembly)	
306023-4	3' Hose Assembly	47206 Crimping Head Coupling needed with these hose assemblies
306023-1	7' Hose Assembly	
306023-2	15' Hose Assembly	
306023-3	21' Hose Assembly	
59220	3-Way Multi-Directional Valve	For use with Foot Switch only
59220-2	3-Way Multi-Directional Valve (Elec. Control)	
59221	6-Way Multi-Directional Valve	
59221-2	6-Way Multi-Directional Valve (Elec. Control)	

**Ordering Information:**

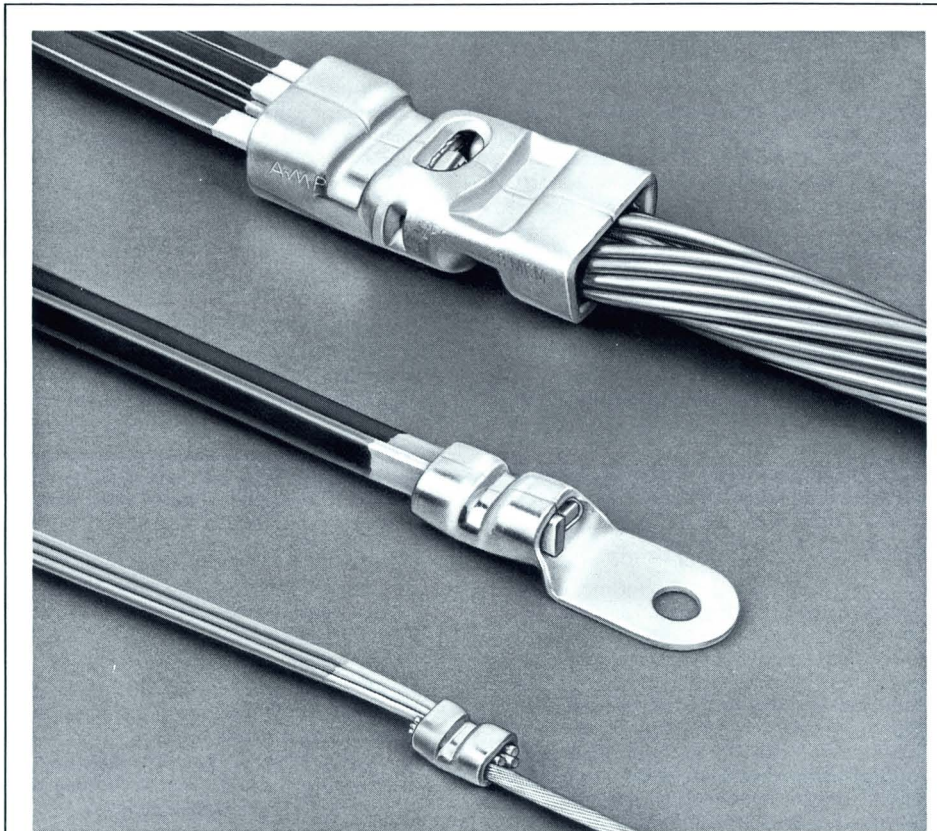
To insure that all applicable AMP part numbers are specified in your order, we recommend that you make your selection in four steps:

1. Select either Electric Hydraulic Tool 69120, Foot Operated Tool 69325 or Hand Tool 69061.
2. Select a head if using either the Electric Hydraulic or Foot Operated Tool.

3. Select dies from the table on this page.
4. Select Control and Hose Mechanism, when using Electric Hydraulic Tool, from Accessory list.

For example: Electric Hydraulic Tool 69120-1, Head 69051, Die Set 47822 (for # 4 AWG wire), 7' Handle Control Assembly—Hose and Cord 59512-5.



**COPALUM**

**Terminals and Splices  
(for Solid & Stranded  
Aluminum or Copper Wire)**

**FEATURES**

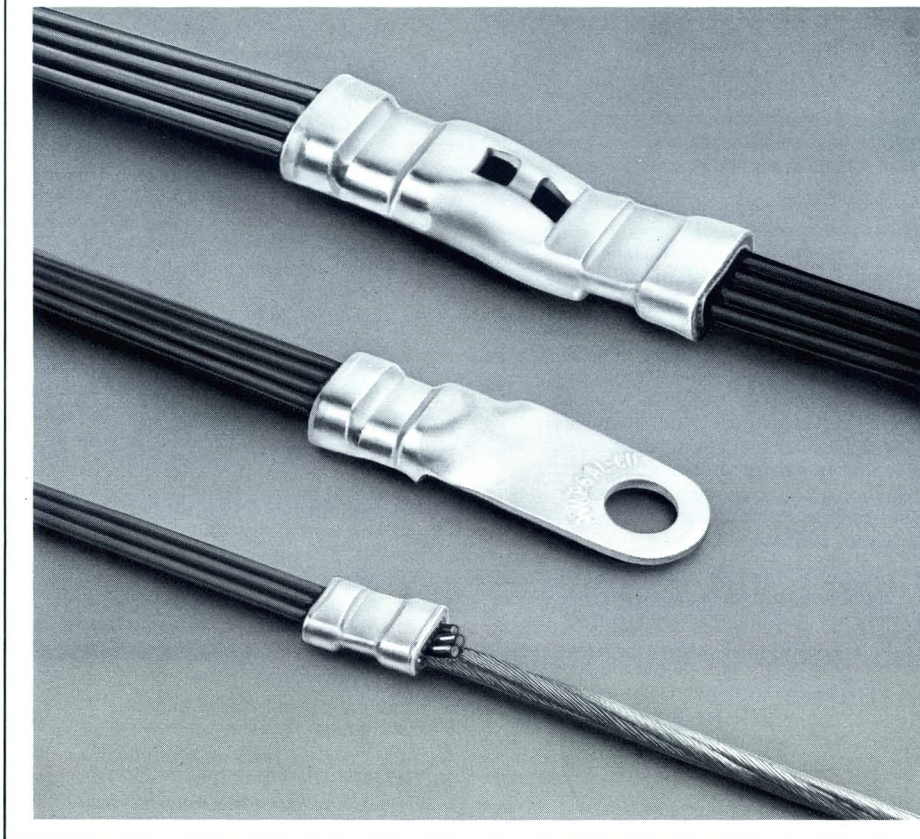
**(Bar Crimp Technique)**

- Terminals and splices for aluminum-to-aluminum and aluminum-to-copper stripped wire applications.
- Terminates stripped stranded and solid (round or rectangular) aluminum and copper conductors . . . individually or in combination.
- Eliminates "messy" inhibitors.
- Available for broad range of wire sizes — from No. 20-18 through 500 MCM.
- Copper body construction.
- Low cost, reliable terminations provide stable electrical and mechanical performance.

**FEATURES**

**(Insulation Piercing Technique)**

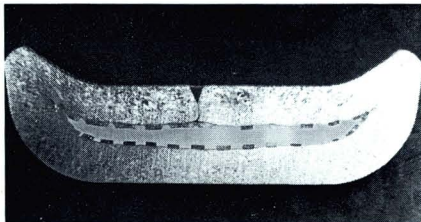
- Terminals and splices for aluminum-to-aluminum, copper-to-copper and aluminum-to-copper wire applications.
- Terminates film insulated solid aluminum, film insulated solid copper, or uninsulated stranded copper conductors . . . individually or in combination.
- Stripping of film insulated solid conductors *not required*.
- Eliminates "messy" inhibitors.
- Available for broad range of wire sizes — from No. 20-18 through 4/0.
- Copper body construction.
- Low cost, reliable terminations provide stable electrical and mechanical performance.



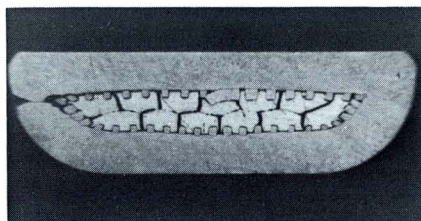
## Introduction

AMP's family of COPALUM terminals and splices provides reliable, low cost terminations for both aluminum and copper wire. Stranded, solid round and rectangular conductors — individually or in combinations falling within a specified CMA (circular mil area) range — can be terminated in the same wire barrel. Also, the same terminals and splices can be crimped to either uninsulated wire using a "bar crimp" configuration or, with the insulation piercing technique, to film insulated wire . . . without a need for prestripping the conductors. Because of such versatility, these AMP products are finding wide usage in industry wherever aluminum wire is being used for its weight and cost savings advantages.

COPALUM terminals and splices are available for terminating a broad range of wire sizes: No. 20-18 through 500 MCM using the bar crimp technique, and No. 20-18 through 4/0 using the insulation piercing method. Each features a copper body construction and employs a perforated copper alloy liner. This construction and design, coupled with the specific AMP crimp, produces electrically and mechanically stable connections by overcoming the inherent problems of aluminum oxide penetration and reformation, cold flow, creep, corrosion and thermal expansion (common in aluminum-to-copper applications).



Cross Section of Bar Crimp



Cross Section of Insulation Piercing Crimp

## The Bar Crimp

The bar crimp technique employs the principle of high crimp deformation to achieve electrically and mechanically reliable terminations. During crimping, the relatively soft aluminum conductor is extruded through the liner perforations, breaking brittle aluminum oxides and allowing clean aluminum metal to be brought into direct contact with the liner and wire barrel. Due to the crimp's tight configuration, reforming of aluminum oxides, as well as the formation of other corrosive films, are minimized. When crimping stranded conductors, this high deformation breaks up the oxides that surround each individual strand and brings the strands into direct contact with each other, creating possible interstrand bonds or "cold welds" among strands. Because of the large number of independent contact surfaces, the total contact area is increased, thus reducing the possibility of electrical failure due to thermal expansion, creep and corrosion.

The termination's mechanical characteristics are achieved through a secondary portion of the crimp, which reduces by a pre-

## The Insulation Piercing Crimp

The insulation piercing crimp technique uses its specific crimp configuration and the perforated design of the terminal or splice liner to break down the film insulation and establish an electrical interface between the conductor and terminal or splice body. During crimping, the film insulated conductor is extruded into the perforated liner causing the film insulation to be sheared. This produces a hermetically sealed interface between the conductor and the body of the terminal or splice. An adequate surface contact area also is achieved due to the high-density hole pattern of the liner. Because of the hermetic seal, terminals and splices using the insulation piercing crimp can be exposed to the gaseous and oil environments found in oil and air cooled transformers or air and Freon cooled motors.

A secondary crimp section provides the mechanical properties of the termination — tensile strength, vibration resistance, flex life, etc. This secondary crimp flanks the electrical crimp, establishing the termination's optimum mechanical characteristics on both sides of the electrical crimp. Such a crimp design permits either parallel, butt or pigtail splicing. The crimp design also allows solid copper, solid aluminum, and stranded copper to be terminated in the same wire barrel if certain restrictions regarding the size, number, and total CMA of conductors being terminated are observed, as follows:

1. In a solid (or combination of solids) aluminum to stranded copper application, the maximum amount of CMA fill for the copper conductor should not exceed 40% of the total CMA being crimped. For example, 6—No. 14 solid aluminum plus 1—No. 8 stranded copper would be a combination falling within this parameter (total CMA = 40M, No. 8 copper = 16M).
2. Up to a *maximum of 10 equal size round* conductors may be crimped without insulation removal.

determined amount, the cross sectional area of the termination. The reduction is totally independent of wire type, size, and shape so long as the wire(s) being terminated fall within the appropriate CMA range. Termination reliability is further enhanced by the fact that inhibitors are not required. Subsequently, COPALUM terminals and splices using the bar crimp method are highly adaptable for oil-filled transformer use.

When three or more rectangular conductors are being crimped, they should be inserted in a random fashion or on edge.

They should not be inserted to permit the electrical and mechanical crimps to be positioned across the width of the conductor.

Both terminal and splice can be crimped in AMP's electro-hydraulic DYNA-CRIMP tool, which accomplishes both electrical and mechanical crimps in a single operating cycle. Also available are manually operated hand tools for terminating wire sizes No. 20-18 through No. 12-10 and pneumatic tooling for sizes No. 20-18 through No. 4.

3. Up to a *maximum of 6 equal square* conductors may be crimped without insulation removal.
4. Four rectangular conductors where  $T \geq 1/4W$  or 2 rectangular conductors where  $T \leq 1/4W$  may be crimped without insulation removal.
5. Due to the physical size limitations of the wire barrel, it may not be possible for a particular CMA loading to physically fit in the normally recommended connector. In these instances, where seven (7) or more equal round conductors or a combination of solid aluminum and stranded copper is used, if the total CMA is at least 50% of the maximum CMA of the next larger size connector, this larger size connector may be used with its appropriate crimping die. For example, 12—No. 14 solid conductors would equal approximately 49000 circular mil, which would fall into the CMA range of the No. 4 size connector which has a maximum recommended CMA of 52,600 circular mils. However, it may not be feasible to insert all twelve of these conductors into the recommended connector yet quite easy to insert into the No. 2 size connector with a recommended CMA range of 52600—83700 circular mils. The 49000 figure represents a 59% loading of the maximum CMA for the No. 2 size connector, thus allowing usage of the No. 2 size connector by the theorem presented.
6. When crimping different size solid conductors, size should not vary by more than one (1) wire gauge, and preferably no more than 1/2 wire gauge.

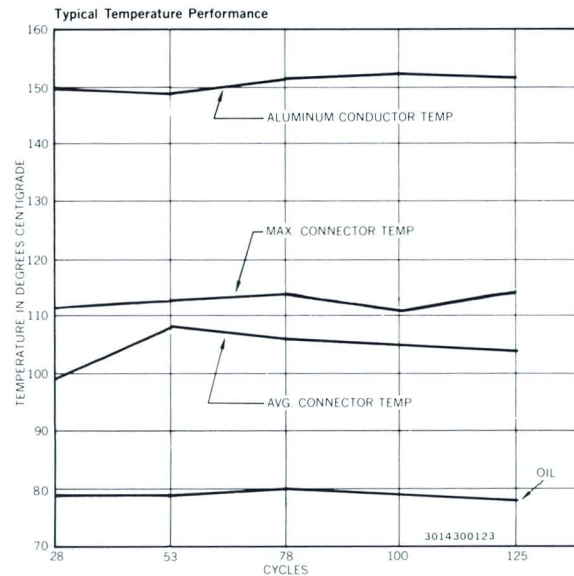
Tooling available for terminating COPALUM terminals and splices using the insulation piercing crimp includes the DYNA-CRIMP tool for sizes No. 8 through No. 4/0, pneumatic tooling for sizes No. 20-18 through No. 6, and manually operated hand tools for sizes No. 16-14 and No. 12-10.

Testing Data

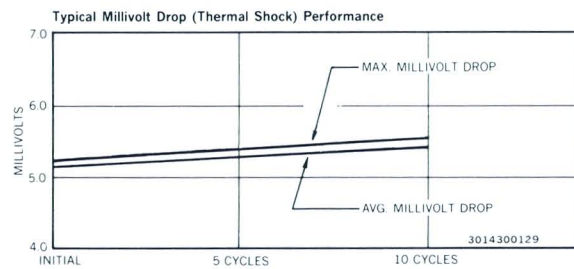
COPALUM terminals and splices, with bar and insulation piercing crimps, were tested for their stability under

various environmental conditions. The environments included current cycling and thermal shock.

Test Results of Bar Crimp Terminations



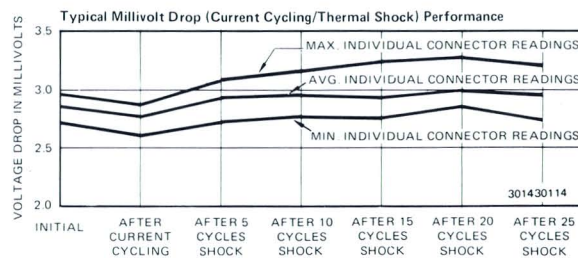
Current Cycling: under oil at 1375 amperes, ac  
Products Tested: COPALUM splices, size 250 MCM



Thermal Shock Testing: 0.5 hr. @ +150°C and -55°C per cycle;  
15 amperes, dc

Products Tested: COPALUM terminals, size No. 8 (terminal-to-terminal readings include two terminations plus 4 inches of conductor length.)

Test Results of Insulation Piercing Crimp Terminations



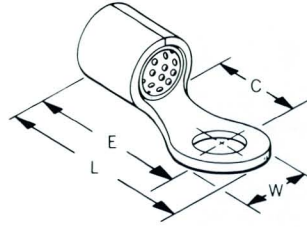
Current Cycling: 100 cycles at 35 amperes, ac; each cycle consisting of 15 minutes "on current" and 15 minutes "off current"

Thermal Shock Testing: 0.5 hr. @ +150°C and 0.17 hr. in ice water per cycle; 5 amperes, dc

Products Tested: COPALUM parallel splices, size No. 8 using two No. 14 solid aluminum conductors (unstripped) and one No. 14 stranded copper wire (stripped). Graph curves represent individual conductor readings.

## Ring Tongue Terminals

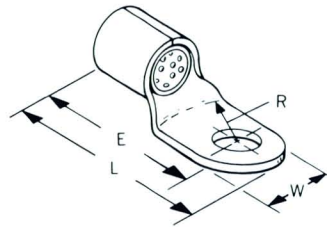
Wire Size Range: No. 20 to 10  
(CMA Range: 810 to 13,100)



Tongue Material Thickness	Aluminum Wire Size		Stud Size	W	L Max.	E Max.	C Min.	Terminal Part No.	Hand Tool No.	Head Nos. for Pneumatic Tools	
	No.	CMA Range								No. 69010	No. 68068
.033 Max.	20-18	810 to 2,050	4	.250	.560	.432	.172	52214	68040 ■	68029 ■, 68134 ▲	_____
			6	.312	.669	.510	.250	51973			
			8	.312	.669	.510	.250	51973-1			
			10	.312	.669	.510	.250	51973-2			
.033 Max.	16-14	2,050 to 5,180	4	.250	.702	.574	.281	52292	68041 ■, 68140-1 ▲	68031 ■, 68093-1 ▲	68104 ■, 68100 ▲
			6	.344	.749	.574	.281	51976			
			8	.344	.749	.574	.281	51976-1			
			10	.344	.749	.574	.281	51976-2			
			1/4	.531	1.107	.839	.564	52587-1			
			3/8	.531	1.107	.839	.564	52587			
.042 Max.	12-10	5,180 to 13,100	6	.375	.835	.645	.302	51979	68042 ■, 68141-1 ▲	68030 ■, 68080 ▲	68104 ■, 68105 ■, 68100 ▲, 68101 ▲
			8	.375	.835	.645	.302	51979-1			
			10	.375	.835	.645	.302	51979-2			
			1/4	.375	.835	.645	.302	51979-3			
			1/4	.593	1.173	.874	.531	52590-1			
			5/16	.593	1.173	.874	.531	52590-2			
3/8	.593	1.173	.874	.531	52590						

■ Denotes bar crimp tooling  
▲ Denotes insulation piercing crimp tooling

Wire Size Range: No. 8 to 4/0  
(CMA Range: 13,100 to 231,000)



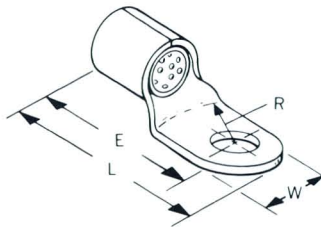
Tongue Material Thickness	Aluminum Wire Size		Stud Size	W	L Max.	E Max.	R Max.	Terminal Part No.	Head Nos. for Pneumatic Tools			Head and Die Insert Nos. for Power Unit No. 69120	
	No.	CMA Range							No. 69015	No. 69010	No. 68068	Head No.	Die Insert No.
.048 Max.	8	13,100 to 20,800	6	.500	1.384	1.131	.560	50720-5	68032 ■, 68081 ▲	68054 ■	68105 ■, 68101 ▲, 68192-1 ▲	69099	68043 ■, 68084 ▲
			10	.500	1.384	1.131	.560	50720					
			1/4	.500	1.384	1.131	.560	50720-1					
			5/16	.625	1.446	1.131	.560	50720-2					
			3/8	.625	1.446	1.131	.560	50720-3					
			7/16	.625	1.446	1.131	.560	50720-4					
.051 Max.	6	20,800 to 33,100	6	.500	1.415	1.162	.580	50719-5	69999 ■, 68082 ▲	_____	68106 ■, 68102 ▲	69099	68044 ■, 68085 ▲
			10	.500	1.415	1.162	.580	50719					
			1/4	.500	1.415	1.162	.580	50719-1					
			5/16	.679	1.504	1.162	.580	50719-2					
			3/8	.679	1.504	1.162	.580	50719-3					
			7/16	.679	1.504	1.162	.580	50719-4					
.060 Max.	4	33,100 to 52,600	10	.531	1.630	1.362	.625	50717	68038 ■	_____	_____	69099	68045 ■, 68086 ▲
			1/4	.531	1.630	1.362	.625	50717-1					
			5/16	.531	1.630	1.362	.625	50717-2					
			.177*	.531	1.630	1.362	.625	50717-4					
			3/8	.675	1.702	1.362	.625	50717-3					
.060 Max.	2	52,600 to 83,700	1/4	.675	1.859	1.541	.625	51982	_____	_____	_____	69099	68046 ■, 68130 ▲
			5/16	.675	1.859	1.541	.625	51982-1					
			3/8	.675	1.859	1.541	.625	51982-2					
			1/2	.807	1.925	1.541	.625	51982-3					

\*This dimension is the max. hole diameter for terminal no. 50717-4.

■ Denotes bar crimp tooling  
▲ Denotes insulation piercing crimp tooling

Ring Tongue Terminals

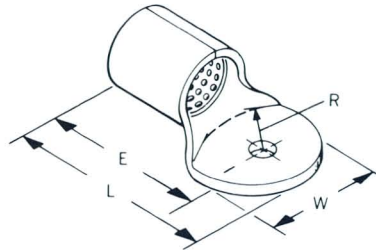
Wire Size Range: No. 8 to 4/0  
(CMA Range: 13,100 to 231,000)  
(Continued)



Tongue Material Thickness	Aluminum Wire Size		Stud Size	W	L Max.	E Max.	R Max.	Terminal Part No.	Head Nos. for Pneumatic Tools			Head and Die Insert Nos. for Power Unit No. 69120	
	No.	CMA Range							No. 69015	No. 69010	No. 68068	Head No.	Die Insert No.
.073 Max.	1/0	83,700 to 119,500	1/4	.675	1.859	1.541	.625	51986				69099	68047 ■ , 68131 ▲
			5/16	.675	1.859	1.541	.625	51986-1					
			3/8	.675	1.859	1.541	.625	51986-2					
			1/2	.807	1.925	1.541	.625	51986-3					
.083 Max.	2/0	119,500 to 150,500	1/4	.906	1.955	1.560	.625	51989				69099	68048 ■ , 68132 ▲
			5/16	.906	1.955	1.560	.625	51989-1					
			3/8	.906	1.955	1.560	.625	51989-2					
			1/2	.906	1.955	1.560	.625	51989-3					
.094 Max.	3/0	150,500 to 190,000	5/16	1.000	2.115	1.645	.625	51992				69099	68049 ■ , 68133 ▲
			3/8	1.000	2.115	1.645	.625	51992-1					
			7/16	1.000	2.115	1.645	.625	51992-2					
			1/2	1.000	2.115	1.645	.625	51992-3					
.105 Max.	4/0	190,000 to 231,000	3/8	1.062	2.178	1.681	.625	51995				69082	68050 ■ , 68129 ▲ , 68073-1
			7/16	1.062	2.178	1.681	.625	51995-1					
			1/2	1.062	2.178	1.681	.625	51995-2					

■ Denotes bar crimp tooling  
▲ Denotes insulation piercing crimp tooling

Wire Size Range: 250 to 500 MCM  
(CMA Range: 231,000 to 600,000)



Tongue Material Thickness	Aluminum Wire Size		Stud Size	W	L Max.	E Max.	R Max.	Terminal Part No.	Head and Die Insert Nos. for Power Unit No. 69120	
	No.	CMA Range							Head No.	Die Insert No.
.130 Max.	250 MCM	231,000 to 300,000	1/4	1.426	2.602	1.987	.625	52559		
			5/16	1.426	2.602	1.987	.625	52559-1	69082	68034 ■
			3/8	1.426	2.602	1.987	.625	52559-2		
			7/16	1.426	2.602	1.987	.625	52559-3		
			1/2	1.426	2.602	1.987	.625	52559-4		
			5/8	1.426	2.602	1.987	.625	52559-5		
68073-1	68161-1 ■									
.140 Max.	300 MCM	300,000 to 380,000	1/4	1.535	2.671	2.056	.625	52558		
			5/16	1.535	2.671	2.056	.625	52558-1	69082	68035 ■
			3/8	1.535	2.671	2.056	.625	52558-2		
			7/16	1.535	2.671	2.056	.625	52558-3		
			1/2	1.535	2.671	2.056	.625	52558-4		
			5/8	1.535	2.671	2.056	.625	52558-5		
68073-1	68162-1 ■									
.158 Max.	400 MCM	380,000 to 478,000	1/4	1.738	2.790	2.175	.625	52568		
			5/16	1.738	2.790	2.175	.625	52568-1	69082	68036 ■
			3/8	1.738	2.790	2.175	.625	52568-2		
			7/16	1.738	2.790	2.175	.625	52568-3		
			1/2	1.738	2.790	2.175	.625	52568-4		
			5/8	1.738	2.790	2.175	.625	52568-5		
68073-1	68163-1 ■									
.182 Max.	500 MCM	478,000 to 600,000	1/4	2.004	3.187	2.447	.750	52569		
			5/16	2.004	3.187	2.447	.750	52569-1	69082	68037 ■
			3/8	2.004	3.187	2.447	.750	52569-2		
			7/16	2.004	3.187	2.447	.750	52569-3		
			1/2	2.004	3.187	2.447	.750	52569-4		
			5/8	2.004	3.187	2.447	.750	52569-5		
68073-1	68164-1 ■									

■ Denotes bar crimp tooling

## Butt Splices

### Wire Size Ranges:

**Aluminum, No. 20 to 10**

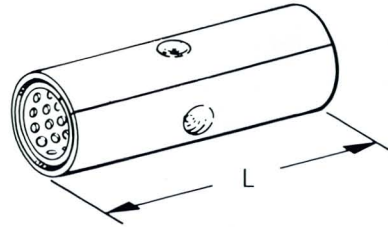
(CMA Range: 810 to 13,100)

**Copper, No. 22 to 12**

(CMA Range: 509 to 8,230)

NOTE: Butt splices will accept the same wire size at either end for aluminum-to-aluminum applications. However, for aluminum-to-copper applications when using "Bar" crimp tooling the size of the copper wire should be "stepped down" — use one smaller wire size — to compensate for differences in the physical properties of copper and aluminum. If "stepping down" is not desirable; i.e., if aluminum-to-copper splices are to be made using the same size wire at each end of the butt splice, AMP recommends that the perforated sleeve be removed from the end of the splice which is to be crimped to copper wire. For the correct butt splice to use, refer to the CMA ranges listed with each part no.

When two or more wires are used in either end of the butt splice, the combined cross section area must be within the CMA range listed.



Wire Sizes				L Max.	Splice Part No.	Hand Tool No.	Head Nos. for Pneumatic Tools	
Aluminum		Copper					No. 69010	No. 68068
No.	CMA Range	No.	CMA Range					
20-18	810	22-20	509	.612	51998	68040 ■	68029 ■ , 68134 ▲	
	to		to					
	2,050		1,290					
16-14	2,050	18-16	1,290	.701	52001	68041 ■ , 68140-1 ▲	68031 ■ , 68093-1 ▲	68104 ■ ,
	to		to					68100 ▲
	5,180		3,260					68104 ■
12-10	5,180	14-12	3,260	.799	52004	68042 ■ , 68141-1 ▲	68030 ■ , 68080 ▲	68105 ■ ,
	to		to					68100 ▲
	13,100		8,230					68101 ▲

■ Denotes bar crimp tooling

▲ Denotes insulation piercing crimp tooling

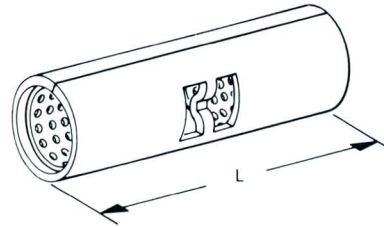
### Wire Size Ranges:

**Aluminum, No. 8 to 4/0**

(CMA Range: 13,100 to 231,000)

**Copper, No. 12 to 3/0**

(CMA Range: 5,180 to 190,000)



Wire Sizes				L Max.	Splice Part No.	Head Nos. for Pneumatic Tools			Head and Die Insert Nos. for Power Unit No. 69120	
Aluminum		Copper				No. 69015	No. 69010	No. 68068	Head No.	Die Insert No.
No.	CMA Range	No.	CMA Range							
8	13,100	12-10	5,180	1.195	51826	68032 ■ , 68081 ▲	68054 ■	68105 ■ , 68101 ▲ , 68192-1 ▲	69099	68043 ■ ,
	to		to							68084 ▲
6	20,800	8	13,100	1.340	51941	69999 ■ , 68082 ▲	68106 ■ , 68102 ▲	69099	68044 ■ , 68085 ▲	
	to		to							
4	33,100	6	20,800	1.630	51942	68038 ■	69099	68045 ■ , 68086 ▲		
	to		to							
2	52,600	4	33,100	1.995	52007	69099	68046 ■ , 68130 ▲			
	to		to							
1/0	83,700	2	52,600	1.985	52010	69099	68047 ■ , 68131 ▲			
	to		to							
2/0	119,500	1/0	83,700	1.985	52013	69099	68048 ■ , 68132 ▲			
	to		to							
3/0	150,500	2/0	119,500	1.985	52016	69099	68049 ■ , 68133 ▲			
	to		to							
4/0	190,000	3/0	150,500	1.985	52019	69082	68050 ■ , 68129 ▲			
	to		to							
	231,000		190,000				68073-1	68160-1 ■		

■ Denotes bar crimp tooling

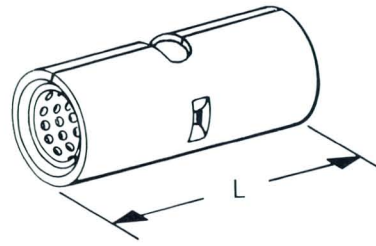
▲ Denotes insulation piercing crimp tooling

Butt Splices

Wire Size Ranges:

Aluminum, 250 to 500 MCM  
(CMA Range: 231,000 to 600,000)

Copper, No. 4/0 to 400 MCM  
(CMA Range: 190,000 to 478,000)

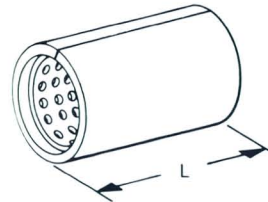


NOTE: Butt splices will accept the same wire size at either end for aluminum-to-aluminum applications. However, for aluminum-to-copper applications when using "Bar" crimp tooling the size of the copper wire should be "stepped down" — use one smaller wire size — to compensate for differences in the physical properties of copper and aluminum. If "stepping down" is not desirable; i.e., if aluminum-to-copper splices are to be made using the same size wire at each end of the butt splice, AMP recommends that the perforated sleeve be removed from the end of the splice which is to be crimped to copper wire. For the correct butt splice to use, refer to the CMA ranges listed with each part no.

When two or more wires are used in either end of the butt splice, the combined cross section area must be within the CMA range listed.

Wire Sizes				L Max.	Splice Part No.	Head and Die Insert Nos. for Power Unit No. 69120	
Aluminum		Copper				Head No.	Die Insert No.
No.	CMA Range	No.	CMA Range				
250 MCM	231,000 to 300,000	4/0	190,000 to 231,000	2.093	52560	69082 68073-1	68034 ■ 68161-1 ■
300 MCM	300,000 to 380,000	250 MCM	231,000 to 300,000	2.217	52561	69082 68073-1	68035 ■ 68162-1 ■
400 MCM	380,000 to 478,000	300 MCM	300,000 to 380,000	2.467	52562	69082 68073-1	68036 ■ 68163-1 ■
500 MCM	478,000 to 600,000	400 MCM	380,000 to 478,000	2.811	52563	69082 68073-1	68037 ■ 68164-1 ■

■ Denotes bar crimp tooling



Wire Size Range: No. 20 to 500 MCM  
(CMA Range: 810 to 600,000)

NOTE: When two or more wires are used in a parallel splice, the combined cross section area must be within the CMA range listed.

Parallel Splices

Aluminum Wire Size		L Max.	Splice Part No.	Hand Tool No.	Head Nos. for Pneumatic Tools			Head and Die Insert Nos. for Power Unit No. 69120	
No.	CMA Range				No. 69015	No. 69010	No. 68068	Head No.	Die Insert No.
16-14	2,050 to 5,180	.283	52791	68041 ■ 68140-1 ▲	—	68031 ■, 68093-1 ▲	68104 ■, 68100 ▲ 68104 ■ or 68105 ■, 68100 ▲ or 68101 ▲	—	—
12-10	5,180 to 13,100	.375	52792	68042 ■ 68141-1 ▲	—	68030 ■, 68080 ▲	68105 ■, 68100 ▲ or 68101 ▲	—	—
8	13,100 to 20,800	.437	52745	—	68032 ■, 68081 ▲	68054 ■	68105 ■ 68101 ▲ 68192-1 ▲	69099	68043 ■, 68084 ▲
6	20,800 to 33,100	.450	52746	—	69999 ■, 68082 ▲	—	68106 ■, 68102 ▲	69099	68044 ■, 68085 ▲
4	33,100 to 52,600	.562	52747	—	68038 ■	—	—	69099	68045 ■, 68086 ▲
2	52,600 to 83,700	.781	52748	—	—	—	—	69099	68046 ■, 68130 ▲
1/0	83,700 to 119,500	.734	52749	—	—	—	—	69099	68047 ■, 68131 ▲
2/0	119,500 to 150,500	.734	52750	—	—	—	—	69099	68048 ■, 68132 ▲
3/0	150,500 to 190,000	.749	52751	—	—	—	—	69099	68049 ■, 68133 ▲
4/0	190,000 to 231,000	.765	52752	—	—	—	—	69082 68073-1	68050 ■, 68129 ▲ 68160-1 ■
250 MCM	231,000 to 300,000	1.062	52805	—	—	—	—	69082 68073-1	68034 ■ 68161-1 ■
300 MCM	300,000 to 380,000	1.124	52806	—	—	—	—	69082 68073-1	68035 ■ 68162-1 ■
400 MCM	380,000 to 478,000	1.249	52807	—	—	—	—	69082 68073-1	68036 ■ 68163-1 ■
500 MCM	478,000 to 600,000	1.421	52808	—	—	—	—	69082 68073-1	68037 ■ 68164-1 ■

■ Denotes bar crimp tooling

▲ Denotes insulation piercing crimp tooling

## Tooling

### Manually Operated Tools

These tools are designed for hand operation and low volume production work or where power is not available. They feature the CERTI-CRIMP ratchet device for controlled compression crimping to provide uniform terminations consistently.



Heavy Head Hand Tools

### Pneumatic Tools

Designed for medium production, these semi-automatic power tools offer the convenience of hand tools plus the effortless precision and speed of machines. They are built for long, rugged service and are equipped with removable crimping dies for terminating a variety of AMP products.



Pneumatic Tool  
No. 69010



Pneumatic Tool  
No. 69015



Pneumatic Tool  
No. 68068 — As shown  
No. 68068-1 — Handle mounted on side of tool  
No. 68068-3 — Foot pedal.  
Can be bench mounted.

### Electro-Hydraulic Tool

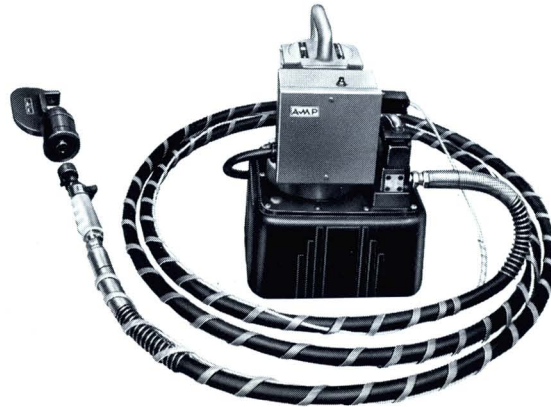
Power Unit Only (Includes Pressure Release)

- 115 Volts — 69120-1
- 230 Volts — 69120-2
- 220 Volts — 1-69120-0

Power Unit Only (Includes Pressure Release: Use with Pressure Release Handle Control Assembly Only)

- 115 Volts — 69120-9
- 230 Volts — 69120-7

The DYNA-CRIMP Power Unit can be equipped with various heads and dies for terminating COPALUM products in wire ranges from No. 8 to 500 MCM. A complete line of accessories is also available with the tool permitting its use in portable and stationary applications as well as for multi-head crimping.



Electro-Hydraulic Tool  
115V—No. 69120-1 (Power Unit Only)  
230V—No. 69120-2 (Power Unit Only)



Power Unit Crimping Head  
No. 69099



Power Unit Crimping Head  
No. 69082

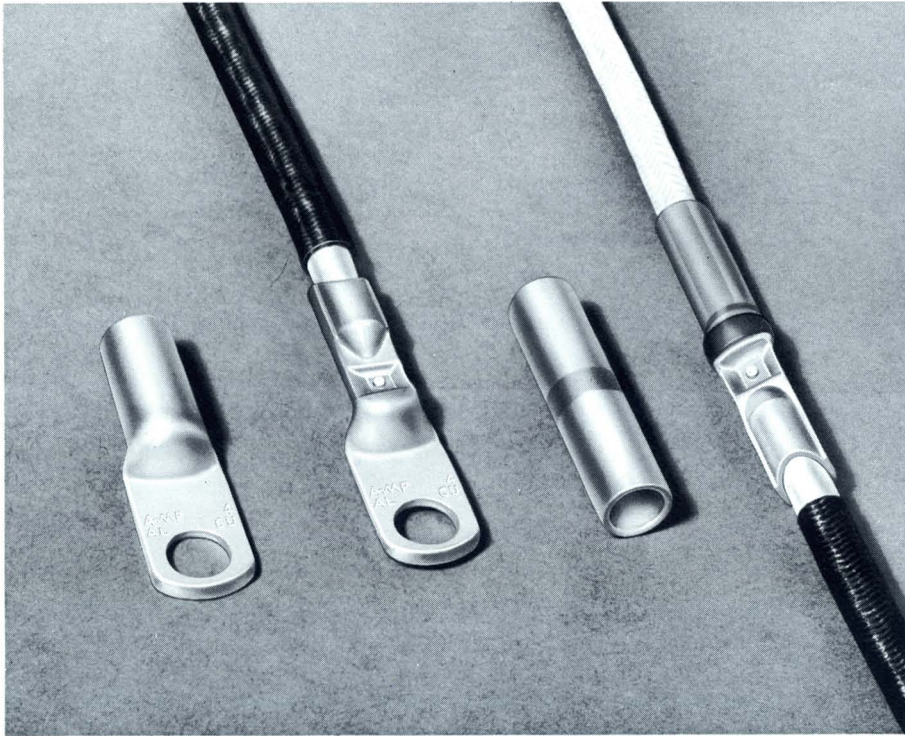


Power Unit Crimping Head  
No. 68073-1

**INCORPORATED**  
HARRISBURG, PENNSYLVANIA 17105  
Phone: 717-564-0100 TWX: 510-657-4110

Number	Description	
59512-5	7' Handle Control Assembly — Hose and Cord	Pressure Release on Power Unit
59512-6	15' Handle Control Assembly — Hose and Cord	
59512-7	21' Handle Control Assembly — Hose and Cord	
59512-9	21' Handle Control Assembly — Cord (Less Hose)	
1-59512-5	28' Handle Control Assembly — Hose and Cord	
1-59512-3	7' Handle Control Assembly — Hose and Cord	Pressure Release Handle
1-59512-2	15' Handle Control Assembly — Hose and Cord	
1-59512-0	15' Handle Control Assembly — Cord (Less Hose)	
1-59512-1	21' Handle Control Assembly — Hose and Cord	
1-59512-6	21' Handle Control Assembly — Cord (Less Hose)	
303775	7' Foot Switch Assembly (needs hose assembly)	
303776	15' Foot Switch Assembly (needs hose assembly)	
303777	21' Foot Switch Assembly (needs hose assembly)	
306023-4	3' Hose Assembly	47206 Crimping Head Coupling needed with these hose assemblies
306023-1	7' Hose Assembly	
306023-2	15' Hose Assembly	
306023-3	21' Hose Assembly	
59220	3-Way Multi-Directional Valve	For use with Foot Switch only
59220-2	3-Way Multi-Directional Valve (Elec. Control)	
59221	6-Way Multi-Directional Valve	
59221-2	6-Way Multi-Directional Valve (Elec. Control)	





### COPALUM Sealed Terminals and Splices (for Stranded Aluminum Wire)

#### FEATURES

- "Dry crimp" technique eliminates need for inhibitor agents.
- Provides terminating and splicing capabilities for stranded aluminum wire plus splicing of aluminum wire to copper wire.
- Offers wide wire size range — No. 8 to 2/0 AWG.
- Three-stage A-MP dies produce three distinct crimps for optimum electrical and mechanical performance as well as insulation sealing characteristics.
- AMP's electro-hydraulic DYNA-CRIMP Tooling assures efficient production rates and uniform reliability . . . at lowest possible cost.

AMP COPALUM Sealed Terminals and Splices are especially designed to solve the inherent problems of terminating aluminum conductors. They are terminated to stranded aluminum wire using a "dry crimp" technique which eliminates the need for an inhibitor agent to break down the highly tenacious and inert oxides that form on aluminum conductors. This extremely efficient and reliable crimping method also produces a sealed connection that prevents re-oxidation and corrosion once intimate terminal/conductor contact is achieved.

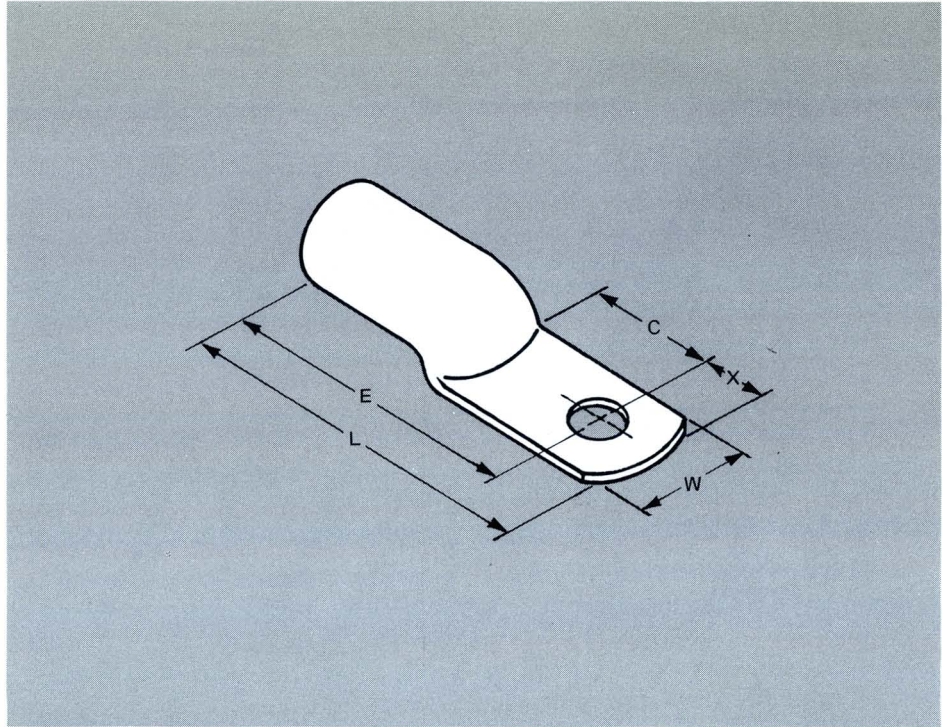
COPALUM Sealed Terminals and Splices are available for terminating and splicing stranded aluminum wire in sizes ranging from No. 8 to 2/0 AWG and also provide the capabilities of splicing aluminum wire to copper wire. They are finding wide application wherever aluminum wire or cable is used and are particularly suited for use in the aerospace industry. Each terminal and splice body is constructed of tin-plated copper and houses a nickel-plated insert and funnel. The funnel is designed to prevent wire strands from hanging up

when inserted into the wire barrel while the perforated insert assures optimum reliability for the terminal and splice when crimped to the aluminum conductor. During the crimping operation, the relatively soft aluminum material extrudes through the insert holes causing the brittle oxide to be sheared and clean aluminum metal to be brought into intimate contact with the inner surfaces of the perforated insert. These areas of extrusion form an air- and moisture-tight seal to minimize re-oxidation and corrosion. The crimping of stranded wire also produces "cold welding" or solid phase bonding between each wire strand. During the crimping process, deformation pressure is applied from several planes causing sufficient plastic flow of the aluminum material. This fractures the oxide film on each wire strand and induces different rates of extrusion. The resultant wiping action under pressure produces interstrand bonding. Since electrical contact is primarily dependent upon the conductor's contact with the insert and the interstrand bonding, excellent electrical characteristics are achieved due to the substantial in-

crease in the contact area created by the large number of independent contact surfaces. The increase in contact area also decreases the possibility of electrical failure due to creep, differences in thermal expansion, and corrosion. A good mechanical connection, too, is obtained since the insert grips the conductor securely.

Both terminal and splice are economically terminated in AMP's electro-hydraulic DYNA-CRIMP Tool which is equipped with a uniquely designed die that simultaneously produces three distinct crimps. The first is performed at the front of the wire barrel, and as previously discussed, provides outstanding electrical performance. The second, also a wire barrel/conductor crimp, is of a sufficient pressure to achieve excellent mechanical characteristics. The third is AMP's patented "O" crimp which crimps the wire barrel and conductor insulation. This insulation crimp, combined with the completely enclosed design of the terminal and splice, assures the environmental integrity of the connection.

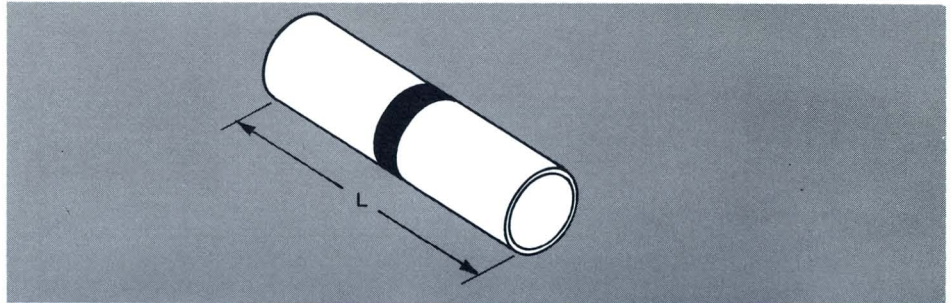
### Ring Tongue Terminals



Wire Size	Ins. Dia. Range	Tongue Thickness (Nom.)	Stud Size	Dimensions					Part Number	Heads and Die Sets for Power Unit No. 69120	
				L Max.	E Max.	W	X Max.	C Min.		Head No.	Die Set No.
8	.182—.200	.069	10	1.660	1.340	.587	.296	.510	52516	69066 (Mod Z) or 69993	68006
			1/4	1.660	1.340	.587	.296	.510	52516-1		
			5/16	1.660	1.340	.587	.296	.510	52516-2		
			3/8	1.660	1.340	.587	.296	.510	52516-3		
6	.225—.250	.088	8	1.897	1.590	.622	.315	.518	52517	69066 (Mod Z) or 69993	68007
			10	1.897	1.590	.622	.315	.518	52517-1		
			1/4	1.897	1.590	.622	.315	.518	52517-2		
			5/16	1.897	1.590	.622	.315	.518	52517-3		
4	.276—.305	.082	3/8	1.897	1.590	.622	.315	.518	52517-4	69066 (Mod Z) or 69993	68008
			8	2.002	1.681	.622	.315	.561	52518-4		
			10	2.002	1.681	.622	.315	.561	52518		
			1/4	2.002	1.681	.622	.315	.561	52518-1		
2	.340—.380	.093	5/16	2.002	1.681	.622	.315	.561	52518-2	69066 (Mod Z) or 69993	68009
			3/8	2.002	1.681	.622	.315	.561	52518-3		
			1/4	2.317	1.956	.670	.340	.559	52519		
			5/16	2.317	1.956	.670	.340	.559	52519-1		
1/0	.425—.470	.101	3/8	2.317	1.956	.670	.340	.559	52519-2	69006 (Mod Z) or 69993	68010
			1/4	2.456	2.050	.807	.406	.530	52520		
			1/4	2.676	2.270	.807	.453	.750	52520-3		
			3/8	2.456	2.050	.807	.406	.530	52520-1		
			3/8	2.676	2.270	.807	.453	.750	52520-4		
2/0	.500—.550	.128	1/2	2.456	2.050	.807	.406	.530	52520-2	69993	68011-1
			1/2	2.676	2.270	.807	.453	.750	52520-5		
			5/16	2.809	2.353	.906	.456	.510	52521-6		
			5/16	3.049	2.593	.906	.456	.750	52521-9		
			3/8	2.809	2.353	.906	.456	.510	52521-7		
			3/8	3.049	2.593	.906	.456	.750	1-52521-0		
			1/2	2.809	2.353	.906	.456	.510	52521-8		
1/2	3.049	2.593	.906	.456	.750	1-52521-1					

Specifications  
(Continued)

Butt  
Splices



Wire Size *		Ins. Dia. Range	L Max.	Part Number	Heads and Die Sets for Power Unit No. 69120	
Aluminum	Copper				Head No.	Die Set No.
8	10	.182—.200	1.413	52522	69066 (Mod Z) or 69993	68006
6	8	.225—.250	1.793	52523	69066 (Mod Z) or 69993	68007
4	6	.276—.305	1.903	52524	69066 (Mod Z) or 69993	68008
2	4	.340—.380	2.513	52525	69066 (Mod Z) or 69993	68009
1/0	2	.425—.470	2.689	52526	69066 (Mod Z) or 69993	68010
2/0	1/0	.500—.550	3.279	52527	69993	68011-1

\* For aluminum-to-aluminum applications, splices will accept the same wire size at either end. For aluminum-to-copper applications, however, the size of the copper wire must be "stepped down" one wire range to compensate for differences in the physical properties of copper and aluminum.

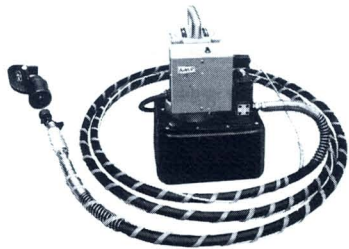
Tooling

Electric Hydraulic Tool

The DYNA-CRIMP Power Unit can be equipped with a variety of heads and dies for terminating A-MP Terminals in wire ranges from 8 to 1000 MCM. A complete accessory line is also available with the tool for use in portable and stationary applications as well as for multiple-head crimping. Consult the Accessory Power Controls and Hoses table for the entire accessory listing.

Accessory Power Controls and Hoses for Tool No. 69120

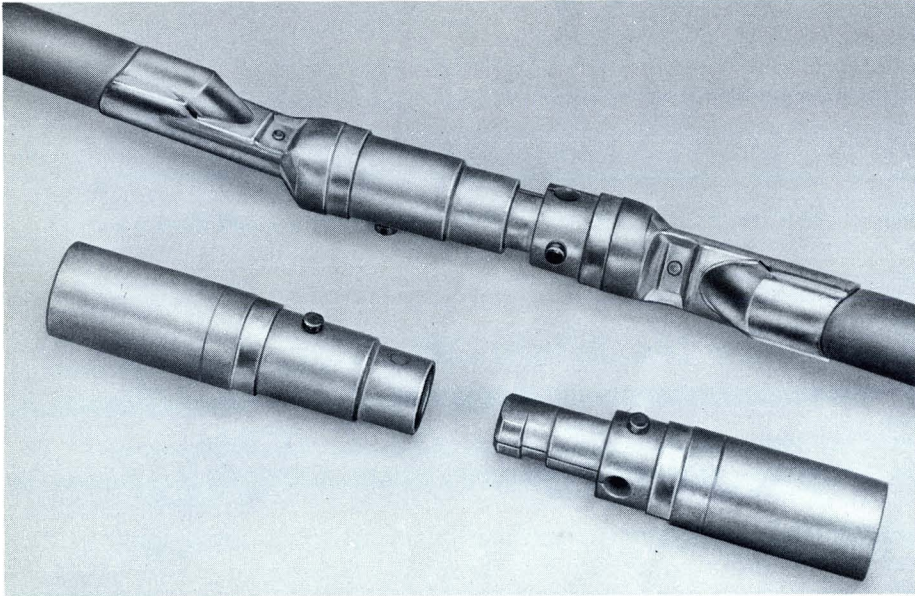
Control and hose accessories must be ordered separately. If tool is to be used in portable applications, a Handle Control and Hose Assembly should be used. For stationary applications, a Foot Switch Assembly, Crimping Head Coupling and Hose Assembly will be necessary. Multi-Directional Valves are used when more than one crimping head is permanently attached to the tool.



Power Unit Only  
(Includes Pressure Release)  
115 Volts – 69120-1;  
230 Volts – 69120-2;  
220 Volts – 1-69120-0

Power Unit Only (Includes Pressure Release:  
For use with pressure release handle control  
assembly only.)  
115 Volts – 69120-9;  
230 Volts – 69120-7

NUMBER	DESCRIPTION	
59512-5	7' Handle Control Assembly — Hose and Cord	} Pressure Release on Power Unit
59512-6	15' Handle Control Assembly — Hose and Cord	
59512-7	21' Handle Control Assembly — Hose and Cord	
59512-9	21' Handle Control Assembly — Cord (Less Hose)	
1-59512-5	28' Handle Control Assembly — Hose and Cord	
1-59512-3	7' Handle Control Assembly — Hose and Cord	} Pressure Release Handle
1-59512-2	15' Handle Control Assembly — Hose and Cord	
1-59512-0	15' Handle Control Assembly — Cord (Less Hose)	
1-59512-1	21' Handle Control Assembly — Hose and Cord	
1-59512-6	21' Handle Control Assembly — Cord (Less Hose)	
303775	7' Foot Switch Assembly (needs hose assembly)	
303776	15' Foot Switch Assembly (needs hose assembly)	
303777	21' Foot Switch Assembly (needs hose assembly)	
306023-4	3' Hose Assembly	47206 Crimping Head Coupling needed with these hose assemblies
306023-1	7' Hose Assembly	
306023-2	15' Hose Assembly	
306023-3	21' Hose Assembly	
59220	3-Way Multi-Directional Valve	For use with Foot Switch only
59220-2	3-Way Multi Directional Valve (Elec. Control)	
59221	6-Way Multi-Directional Valve	
59221-2	6-Way Multi-Directional Valve (Elec. Control)	



AMP COPALUM Sealed Welding Cable Disconnects are specifically designed to overcome the inherent problems of terminating "fine stranded" aluminum conductors such as highly flexible welding cable. Use of the AMP "dry crimp" technique eliminates the need for an inhibitor agent, saving time in extra operation and cleanup. The "dry crimp" method produces a sealed interface, preventing reoxidation and corrosion.

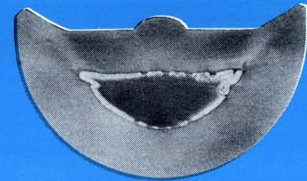
The terminal body is constructed of tin-plated copper with an integral tin-plated copper alloy perforated insert and funnel entry ring. The funnel entry ring is designed to facilitate wire insertion while the perforated insert fractures the aluminum oxides on the outer strands of the wire bundle establishing an intimate wire to wire barrel contact. Using the principles of high deformation and controlled extrusion accomplished by the specific crimp design, establishment of intimate metallic contact, and possibly even the formation of "cold welds" between inner strands of the conductor bundle is obtained. This is necessary to obtain a consistent, predictable, and long life termination when using stranded aluminum conductors. This high

deformation/controlled extrusion technique provides for a substantial increase in actual contact area over previous crimp techniques due to the large number of individual and independent contact surfaces created. This increase in contact area substantially limits or eliminates the possibility of electrical failure due to creep, differences in coefficients of thermal expansion in bi-metallic contacts, and corrosion.

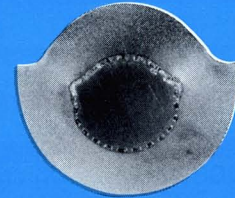
COPALUM Sealed Welding Cable Disconnects are applied, using AMP's electro-hydraulic or foot operated DYNA-CRIMP tool equipped with the uniquely designed die that simultaneously produces these distinct crimps. The first is performed at the front of the wire barrel, and as discussed previously, provides outstanding electrical performance. The second, also a wire barrel crimp, is of lesser deformation providing the mechanical properties of the crimp and acting as a transition to the third and final crimp section. This crimp occurs on the insulation barrel portion using AMP's proven "O" crimp design which, coupled with enclosed design of the terminal, provides an environmental seal and excellent strain relief for the cable.

### COPALUM Welding Cable Disconnect

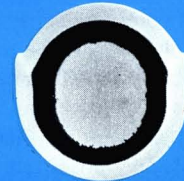
Cross sections of three distinct areas of the crimp.



Front wire barrel crimp provides electrical connection.



Rear wire barrel crimp provides mechanical connection.



Insulation barrel crimp provides environmental seal and strain relief.

### Features

- Lower inventory and permits smooth change over from copper to light weight and less expensive aluminum cable.
- Considerable saving on material and labor due to no burn offs.
- Reduces corrosion giving longer life.
- Dry Crimp eliminates special brushing and inhibitors therefore saving material and labor.
- No danger of oxidation or corrosion. No aluminum exposed to the environment.

**Note:** All dimensions in inches. Specifications subject to change. Consult AMP Incorporated for latest design specifications.

Specifications

Disconnect

**Aluminum Wire:**

Size—4/0  
 CMA Range—190,000 to 231,000  
 Insulation Dia. Range—.825 to .925

**Copper Wire:**

Size—3/0  
 CMA Range—150,000 to 190,000  
 Insulation Dia. Range—.825 to .925

**Head and Die Insert Part Numbers for use with DYNA-CRIMP units:**

Head—68183-1  
 Die Insert—68184-1

Tooling



**Electro-Hydraulic Tool**

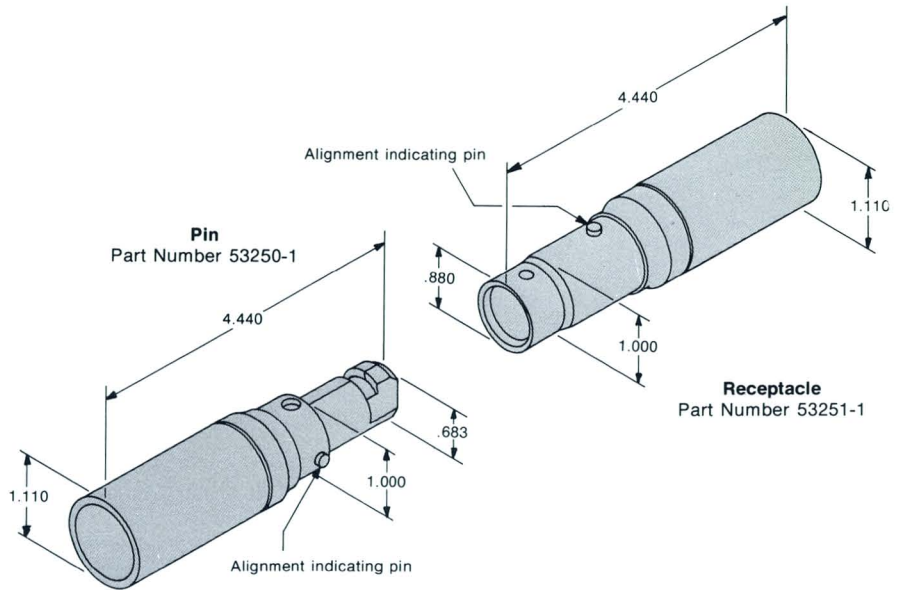
Power Unit Only  
 (Includes Pressure Release)  
 115 Volts—69120-1  
 230 Volts—69120-2  
 220 Volts—1-69120-0

Power Unit Only  
 (Includes Pressure Release:  
 Use with Pressure Release  
 Handle Control Assembly Only)  
 115 Volts—69120-9  
 230 Volts—69120-7



**Foot Operated Tool**

69325—Includes 7' hose  
 69325-1—Includes 15' hose



**Electro-Hydraulic Tool**

The DYNA-CRIMP Power Unit provides electric hydraulic powered crimping for the COPALUM Welding Cable Disconnect. Heads and dies for this unit are available for other types of AMP terminals in wire ranges from #8 to 1000 MCM.

A complete accessory line is also available with the tool for use in portable and stationary applications as well as for multiple-head

crimping. Consult the Accessory Power Controls and Hoses table for the entire accessory listing.

**Foot Operated Tool**

A DYNA-CRIMP self-powered unit for intermittent service or for locations where outside power sources are not available.

Heads and dies for this tool are available for other AMP terminals in ranges from #8 to 1000 MCM.

**Accessory Power Controls and Hoses** for Electro-Hydraulic Tool Control and hose accessories must be ordered separately. If tool is to be used in portable applications, a Handle Control and Hose Assembly should be used. For stationary

applications, a Foot Switch Assembly, Crimping Head Coupling and Hose Assembly will be necessary. Multi-Directional Valves are used when more than one crimping head is permanently attached to the tool.

Number	Description	
59512-5	7' Handle Control Assembly—Hose and Cord	
59512-6	15' Handle Control Assembly—Hose and Cord	Pressure Release on Power Unit
59512-7	21' Handle Control Assembly—Hose and Cord	
59512-9	21' Handle Control Assembly—Cord (Less Hose)	
1-59512-5	28' Handle Control Assembly—Hose and Cord	
1-59512-3	7' Handle Control Assembly—Hose and Cord	
1-59512-2	15' Handle Control Assembly—Hose and Cord	Pressure Release Handle
1-59512-0	15' Handle Control Assembly—Cord (Less Hose)	
1-59512-1	21' Handle Control Assembly—Hose and Cord	
1-59512-6	21' Handle Control Assembly—Cord (Less Hose)	
303775	7' Foot Switch Assembly (needs hose assembly)	
303776	15' Foot Switch Assembly (needs hose assembly)	
303777	21' Foot Switch Assembly (needs hose assembly)	
306023-4	3' Hose Assembly	47206 Crimping Head Coupling needed with these hose assemblies
306023-1	7' Hose Assembly	
306023-2	15' Hose Assembly	
306023-3	21' Hose Assembly	
59220	3-Way Multi-Direction Valve	
59220-2	3-Way Multi-Directional Valve (Elec. Control)	For use with Foot Switch only
59221	6-Way Multi-Direction Valve	
59221-2	6-Way Multi-Directional Valve (Elec. Control)	



### Large Size Open-Barrel Terminals (for Aluminum and Copper Wire)

AMP large size open-barrel terminals provide low cost, reliable terminations with extreme versatility. They are available in a variety of base materials to meet your specific demands; aluminum, tin-over-nickel plated brass, and tin-over-nickel plated steel. All provide for a wide range of applications on aluminum wire. The brass and steel terminals may also be used on copper wire.

Terminal sizes are available for terminating aluminum and copper wire from No. 8 AWG through No. 2 AWG. Stud sizes range from No. 6 to 1/2".

Specifically designed hydraulic tooling

crimps the wire barrel with a combination bar crimp (used on the popular AMP COPALUM terminals) and standard AMP "F" crimp. The insulation barrel is crimped with a standard "O" crimp to provide insulation support and extra mechanical strength to the wire termination. This crimping technique, combined with precisely designed serrations in the wire barrel, parabolically deforms the wire to promote surface extension and inter-strand bonding. This technique is particularly necessary for removing the tenacious oxides on aluminum wire and minimizing their reformation in the crimp region.

#### Features

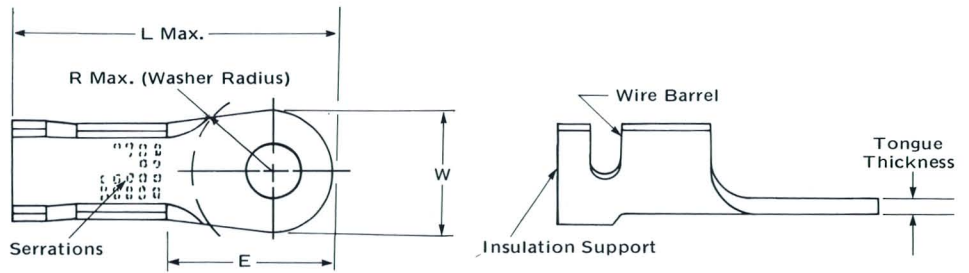
- Provides stable electrical and mechanical performance for aluminum cable.
- Low cost, reliable open barrel terminations.
- Available in aluminum, tin-over-nickel brass, and tin-over-nickel steel.
- Sizes for No. 8 AWG through No. 2 AWG aluminum and copper wire.
- Brass and steel terminals may also be used on copper wire.
- Stud sizes cover a range from No. 6 to 1/2".
- Eliminates messy inhibitors.
- Can be automated for high production rates.

**Note:** All dimensions in inches unless indicated otherwise.

Specifications subject to change. Consult AMP Incorporated for latest design specifications.

Specifications

**Wire Size Range:**  
**Aluminum and Copper, No. 8 to 2**  
 (CMA Range: 13,100 to 83,700)



Aluminum and Copper Wire Size		Ins. Dia. Range	Tongue Material Thickness	Stud Size	Dimensions				Terminal Part Numbers			Head and Die Insert Nos. for Power Unit No. 69120	
No.	CMA Range				R	L	E	W	Brass*	Aluminum	Steel*	Die Insert	Head
8	13,100 to 20,800	.250-.350	.040 ±.003	6	.300	1.357	.596	.292	53500-7	1-53500-8	2-53500-5	68215-1	
				8	.300	1.420	.659	.416	53500-9	1-53500-9	2-53500-7		
				10	.300	1.412	.651	.400	53500-1	53500-2	53500-3		
				1/4	.400	1.551	.790	.478	1-53500-1	2-53500-0	2-53500-9		
				5/16	.400	1.608	.847	.593	1-53500-3	2-53500-1	3-53500-1		
				3/8	.500	1.786	1.025	.750	1-53500-5	2-53500-2	3-53500-3		
				1/2	.500	1.811	1.050	.800	1-53500-7	2-53500-3	3-53500-5		
				10	.350	1.722	.862	.625	53600-2	1-53600-1	1-53600-7		
6	20,800 to 33,100	.275-.325	.049 ±.002	1/4	.400	1.807	.947	.625	53600-4	1-53600-2	1-53600-9	68218-1	69099
				5/16	.450	1.872	1.012	.625	53600-6	1-53600-3	2-53600-1		
				3/8	.500	1.922	1.062	.625	53600-8	1-53600-4	2-53600-3		
				1/2	.550	2.072	1.212	.875	1-53600-0	1-53600-5	2-53600-5		
				10	.350	2.026	.978	.656	53601-2	1-53601-1	1-53601-7		
				1/4	.400	2.111	1.063	.656	53601-4	1-53601-2	1-53601-9		
				5/16	.450	2.167	1.128	.656	53601-6	1-53601-3	2-53601-1		
				3/8	.500	2.226	1.178	.656	53601-8	1-53601-4	2-53601-3		
4	33,100 to 52,600	.300-.375	.059 ±.003	1/2	.550	2.360	1.312	.875	1-53601-0	1-53601-5	2-53601-5	68219-1	
				10	.350	2.026	.978	.656	53601-2	1-53601-1	1-53601-7		
2	52,600 to 83,700	.350-.450	.078 ±.004	3/8	.500	2.723	—	.750	53501-1	53501-2	53501-3	68216-1	69099
													68217-1

\*Brass and steel terminals may be used on either aluminum or copper wire. Aluminum terminals are for use with aluminum wire only.

**Materials and Finishes:**

Brass terminals per QQ-B-626, plated .0001" thick tin (MIL-T-10727) over .0002" thick nickel (QQ-N-290)

Aluminum terminals per QQ-A-250/11, unplated

Steel terminals per QQ-S-700, plated .0001" thick tin (MIL-T-10727) over .0002" thick nickel (QQ-N-290)

**Temperature Range:** to +105°C

**Current Rating:** Any combination of ambient temperature, wire and terminal size, and current passing through the terminal which does not raise the temperature above 105°C is permissible.

**Tooling**



Electro-Hydraulic Tool  
 115V – No. 69120-1 (Power Unit Only)  
 230V – No. 69120-2 (Power Unit Only)



Power Unit Crimping Head  
 No. 69099



Power Unit Crimping Head  
 No. 69082

The DYNA-CRIMP Power Unit can be equipped with various heads and dies for terminating AMP products in wire ranges from No. 8 to 500 MCM. A complete line of accessories is available with the tool, permitting its use in portable and stationary applications as well as for multi-head crimping.

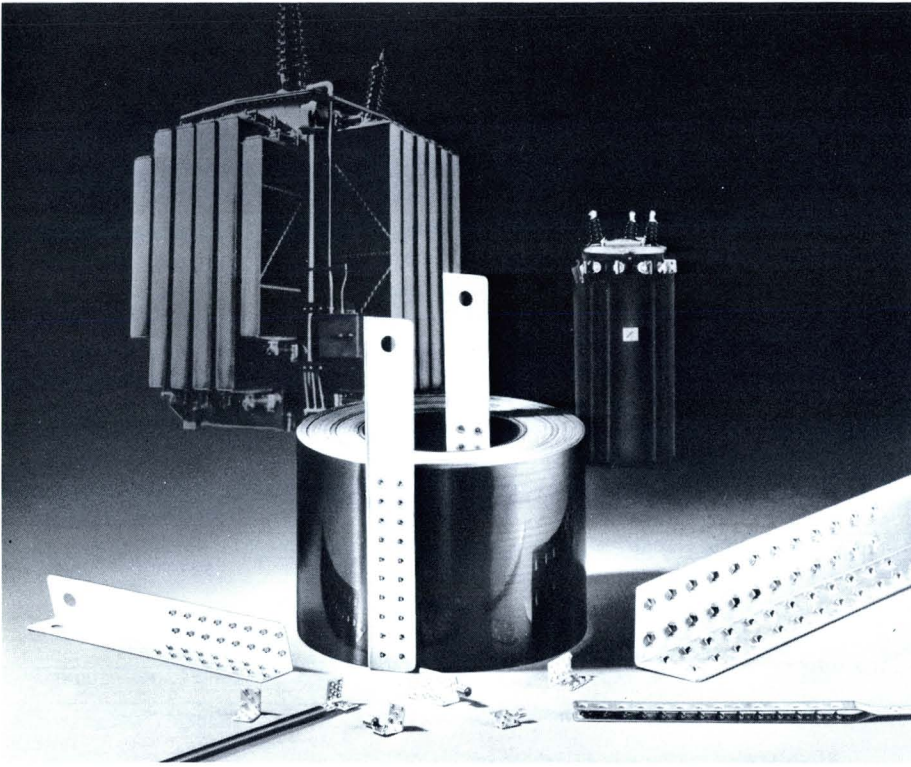
Power Unit Only (Includes Pressure Release)

- 115 Volts – 69120-1
- 230 Volts – 69120-2
- 220 Volts – 1-69120-0

Power Unit Only (Includes Pressure Release: Use with Pressure Release Handle Control Assembly Only)

- 115 Volts – 69120-9
- 230 Volts – 69120-7

## Terminals and Splices for Special Applications



These terminations now make it possible for the transformer manufacturer to use aluminum foil or strip instead of copper wire windings. TERMINI-FOIL terminals and splices have a calculated number of precision-spaced lances that penetrate surface oxides and insulation and imbed themselves in the foil or strip when the two faces are clamped together. This results in an airtight and moisture-proof connection, with no need for surface preparation or time-consuming terminating equipment.

Terminations thus made are reliable, light, economical, and quickly done. They dissipate heat efficiently and are mechanically strong. Tests in air and under oil show entirely satisfactory performance, in both elevated and sub-zero temperatures, during current cycling and overload conditions. There are two types of TERMINI-FOIL terminals: wire-to-foil types (for wire sizes #22 to #8) and larger tap types (in lengths up to 15 inches) with provision for lead termination.

Selection of the proper TERMINI-FOIL Terminal or Splice depends on several factors: **(a)** The terminal must have the same current carrying capacity as the aluminum strip (i.e., the CMA of the TERMINI-FOIL termination must be equivalent to the CMA of the aluminum strip).

The following formula or the nomograph inside may be used in the selection of the proper TERMINI-FOIL terminal or splice.

$T$  = thickness of aluminum strip in mils.

$W$  = width of aluminum strip in mils.

$T \times W \times 1.273 \times .62$  = equivalent CMA of the TERMINI-FOIL terminal or splice to be used.

**(b)** The lanced area of the TERMINI-FOIL terminal must cover a minimum of 60% of the width of the aluminum strip to insure proper current distribution in the foil. **(c)** For TERMINI-FOIL terminals with wire barrels the current carrying capacity of the wire used in conjunction with the terminal can be considered as the current carrying capability of the connection.

## TERMI-FOIL Terminals and Splices

### Features

- Accommodates aluminum foil or strip thicknesses from .001 to .095, soft copper to .010
- Exceeds current carrying requirements
- For use in air or oil filled transformers, capacitors, reactors, solenoids, relays, regulators, etc.
- No surface preparation necessary
- No noise injection in low-level audio circuits
- Available plain, tinned, or nickel-plated in copper, brass, steel and aluminum
- Terminate or tap aluminum-foil wound coils
- Splice two or more pieces of foil or strip
- Apply to bare, insulated, anodized, or coated aluminum and bare or insulated copper
- Can be applied in heating elements, alarm systems, electrostatic shields
- Lower applied cost
- Tin-plated items acceptable for use to 175°C; nickel-plated to 343°C

**Note:** All dimensions in inches.

**Specifications subject to change.**  
Consult AMP Incorporated for  
latest design specifications.



**Material:**

Most TERMI-FOIL terminals and splices are made from copper per QQ-C-576 and finished with tin plating per MIL-T-10727 or nickel plate per QQ-N-290, or just cleaned and

unplated. The aluminum conductor terminated for the tests consisted of bare, anodized, coated, and insulated E.C. grade aluminum foil and sheet.

**Test Conditions and  
Construction:**

Test environments include oven cycling, and oil and air cycling. Samples were energized with D.C. and 60 cycle AC current. Samples prepared by crimping TERMI-FOIL terminals to both ends of aluminum conductor. Resistance measurements were obtained using the Voltage Drop Method.

Standard Appendix C57.92 (Guide for loading oil-immersed distribution and power transformers) and Electrical Standards Board sponsored publications C57.12.00-1965 (American Standard general requirements for distribution, power, and regulating transformers and shunt reactors) and C57.12.90-1965 (American Standard test code for distribution, power, and regulating transformers and shunt reactors).

In all tests, no significant change in resistance occurred when tested within the temperature range and conditions specified in U.S.A.

**Test Parameters:**

**Short circuit:** Terminals were subjected to momentary high current tests. Tests were conducted with two second surge currents simulating  $6\frac{1}{2}$  times rated operating current.

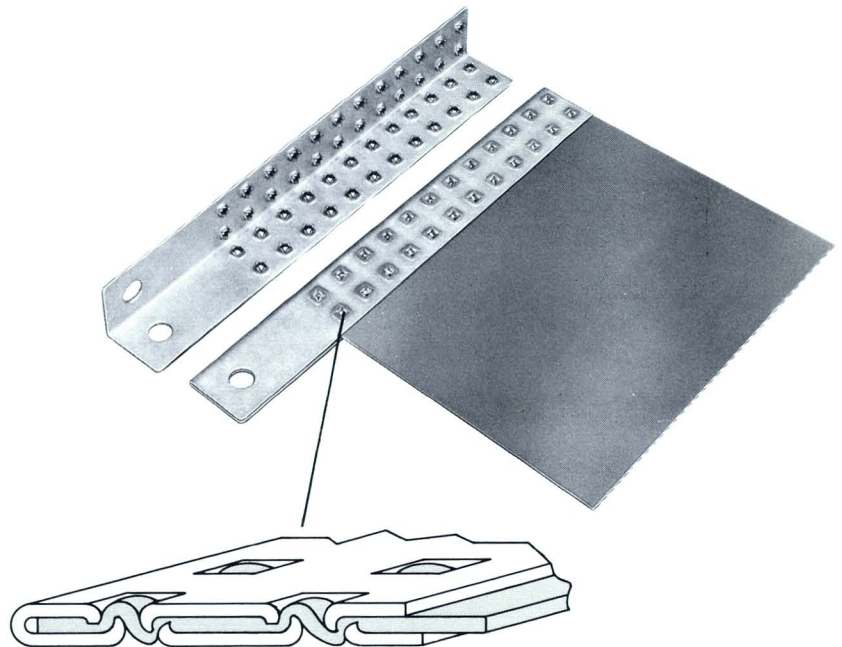
**Current cycling:** Terminals energized one hour on, one hour off, at twice rated current for 30 days minimum. Tests conducted at room temperature (20°C.) and at 155°C.

**Current heat cycling:** End tap terminals were energized until crimped section attained a temperature of 95°-120°C. for 2500 cycles 15 mins. on, 15 mins. off.

**Thermal shock:** Temperature cycling from -40°C. to +200°C.

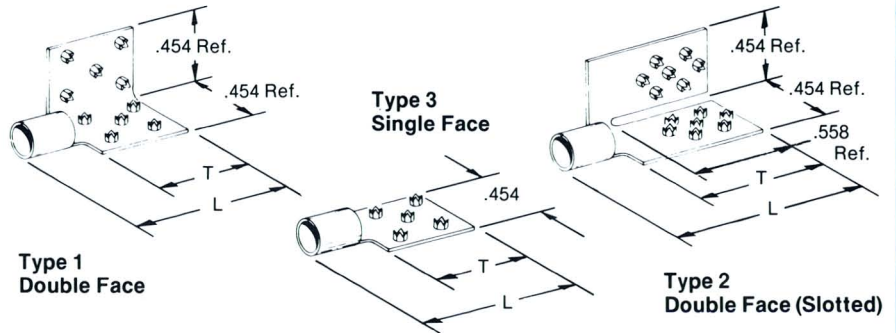
**Noise Tests:** No noise generated in circuit by the terminal when used in low-level audio circuitry.

**Typical  
Cross Section**



**TERMI-FOIL  
Terminals and  
Splices**

Terminals  
For .030 Max.  
Foil Thickness



Material and Finish	Type	Wire Barrel Range	Dimensions		Terminal Part Number	Foil Crimp Tooling	
			T	L Max.		Hand Tool	Dies for Pneu. Tool #69010 with Head #69263-1
Nickel Plated Copper	1	16-14	.408	.671	329860		
	1	12-10	.408	.781	329254	68026*	69177-1
	2	16-14	.708	.989	52195		
	2	12-10	.708	1.068	330716		
Tin Plated Copper	3	16-14	.408	.671	329255		
	3	12-10	.408	.768	53613-2	68026-2	69176-1
	1	12-10	.408	.781	2-329254-4		
	2	12-10	.708	1.068	1-330716-2		
	1	12-10	.932	1.296	330003	68026*	69177-1
	1	12-10	2.111	2.484	330004		
	1	12-10	2.635	3.000	330005		
	1	8	3.549	3.979	50682		

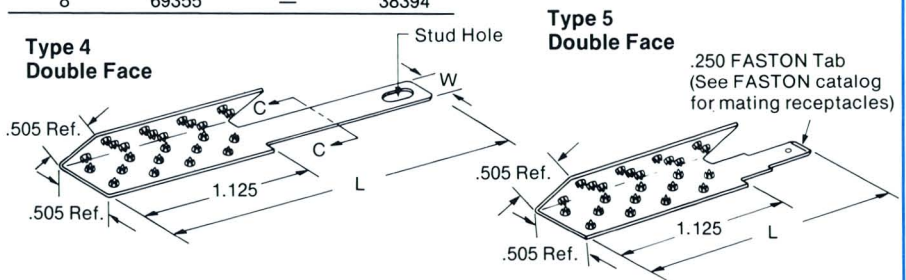
\* For heavy duty use tool #68064.

**Wire Barrel Crimp Tooling\*\***

Wire Range	Hand Tool	Dies for Pneu. Tool	
		#69005	#69010
16-14 and 12-10	49935	300454	300583
8	69355	—	38394

\*\* This is only a partial listing of the tools available for crimping the wire barrel. For additional tooling information and recommendations consult AMP Incorporated.

End Tap Terminals  
For .030 Max.  
Foil Thickness

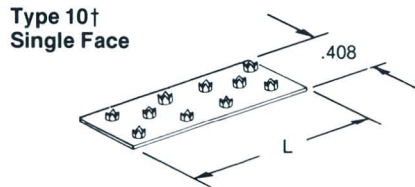
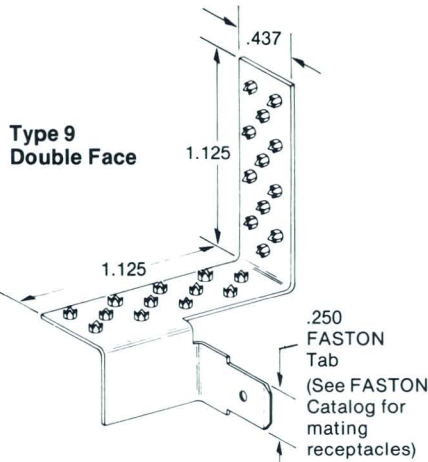


Material and Finish	Type	Terminal CMA at C-C	Stud Hole	Dimensions		Terminal Part Numbers	Foil Crimp Tooling		
				W	L		Hand Tool	Dies for Pneu. Tool #69010 with Head #69263-1	Dies for Power Unit #69120 with Head #69099
Tin Plated Copper	4	11,100	.141 x .284	.281	2.312	51911-8			
	4	14,800	.172 x .310	.375	2.312	51911-9			
	4	14,800	.172 x .310 and (2) #10 Stud Holes	.375	2.312	53604-2	68026*	69177-1	69944
	4	16,000	.203 x .334	.406	2.312	1-51911-0			
	4	17,250	.266 x .406	.437	2.312	1-51911-1			
Tin Plated Copper Unannealed	5	—	—	—	1.615	51943			
	4	11,100	.141 x .284	.281	2.312	51911			
	4	14,800	.172 x .310	.375	2.312	51911-1	68026*	—	69965
	4	14,800	.172 x .310	.375	1.875	52570			
	4	16,000	.203 x .334	.406	2.312	51911-2			
4	17,250	.266 x .406	.437	2.312	51911-3				

\* For heavy duty use tool #68064.

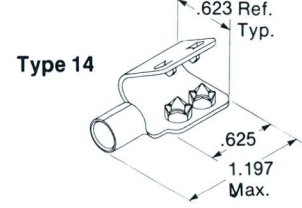
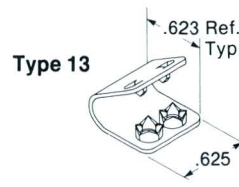
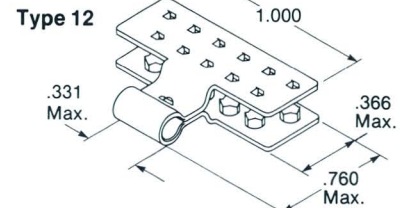
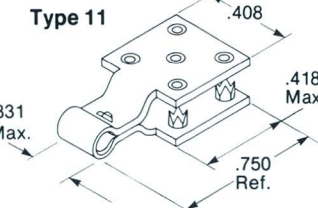
# TERMI-FOIL Terminals and Splices

Splices  
For .030 Max.  
Foil Thickness

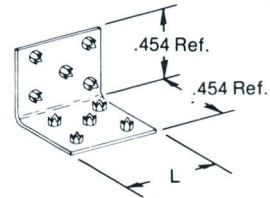


Double Face Tap

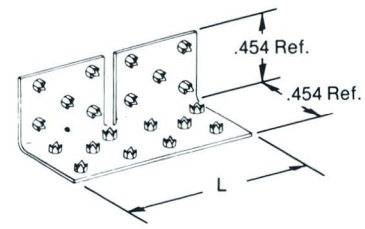
Power Factor Capacitor  
Tap Splice and Terminal  
For .095 Max. Foil  
Bundle Thickness



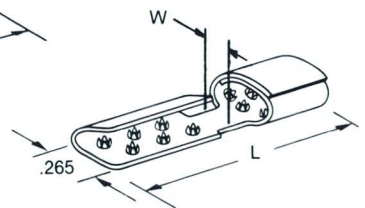
Type 6  
Double Face  
Parallel Splice



Type 7  
Double Face  
Butt Splice



Type 8  
Double Face



Wire Range	Material and Finish	Type	Dimensions		Part Number	Foil Crimp Tooling	
			W	L		Hand Tool	Dies for Pneu. Tool #69010 with Head #69263-1
Current carrying capacity equal to #10 AWG	Tin Plated Copper	6	—	.932	52275	68026*	69177-1
		6	—	.408	329656		
		7	—	.932	329657		
		9	—	—	332510		
	Nickel Plated Copper	8	.170	1.012	1-332006-0	68026*	69177-1
		8	.340	1.012	1-332006-2		
		6	—	.408	1-329656-1		
		7	—	.932	1-329657-1		
Brass	10	—	.865	332063†	69741 or 68026-2	69176-1	

\*For heavy duty use tool #68064.  
†For .015 max. foil thickness.

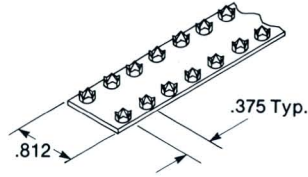
Foil Thickness	Type	Material and Finish	Wire Barrel Range	Part Number	Foil Crimp Tooling		Wire Barrel Crimp Tooling	
					Hand Tool	Dies for Pneu. Tool #69010 with Head #69263-1	Hand Tool	Head for Pneu. Tool #69005
.030 Max. Foil	11	Tin Plated Copper	22-16	52584	68026*	69177-1	69997	—
.010 Max. Bare or Insulated Foil	12	Tin Plated Copper	18-14 (Solid) 18-12 (Stranded)	53264-2	68099-1	—	49975	37917

\*For heavy duty use tool #68064.

Material and Finish	Type	Wire Barrel Range	Part Number	Foil Crimp Tooling	Wire Barrel Crimp Tooling	
				Jaws for #68068, -1, -3, -4, -5	Jaws for #68068, -1, -3, -4, -5	Head for Pneu. Tool #69010
Tin Plated Brass	13	—	53612-2	68257-1	—	—
Tin Plated Steel	13	—	53612-4	68257-1	—	—
Tin Plated Brass	14	8	53660-4	68257-1	68135	38394
Tin Plated Steel	14	8	53660-2	68257-1	68135	38394

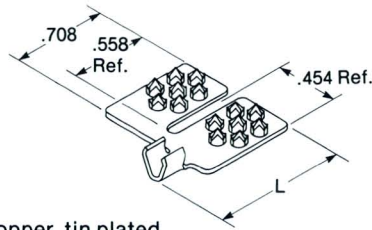
# TERMI-FOIL Terminals and Splices

Single Face Strip  
For .020 Max.  
Foil Thickness



300 Ft. Coil  
Material: Copper  
Terminal CMA: 18,562  
Part Number: 53129-1  
Hand Tool: 68026-2  
Power Unit: 69120 with Head 69980

Strip Tap Terminals  
For .030 Max.  
Foil Thickness

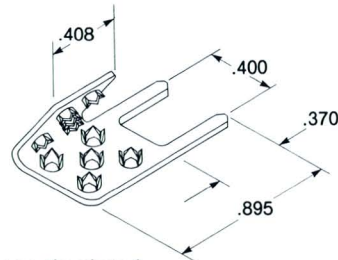


Material and Finish: Copper, tin plated

Wire Barrel Range	L Max.	Terminal Part Number	Wire Barrel Crimp Tooling		Foil Crimp Tooling	
			AMP-O-LECTRIC Machine #1-471273-2 with Applicator #68196-1	Hand Tool	Dies for Pneu. Tool #69010 with Head #69263-1	
16-14	.989	53645-2	Dies #68194-1	68026*		69177-1
12-10	1.068	53644-2	Dies #68195-1			

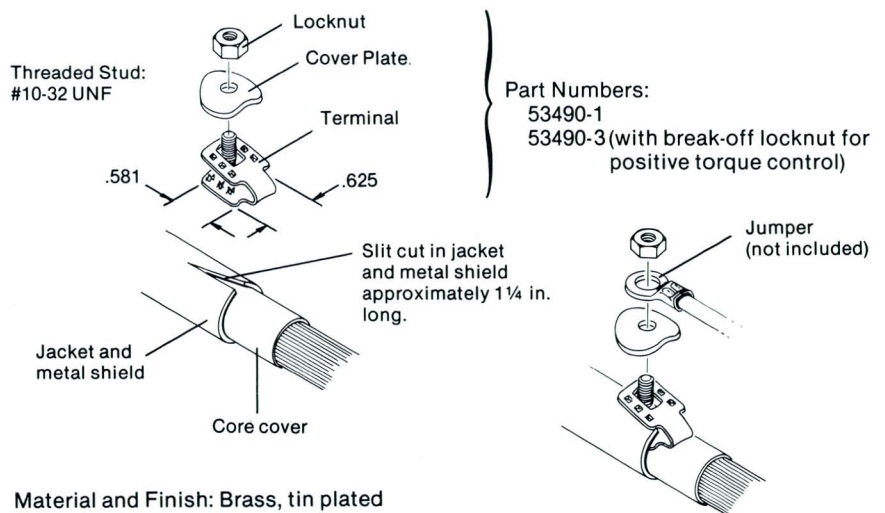
\*For heavy duty use tool #68064.

Strip Tap  
For .030 Max.  
Foil Thickness



Material and Finish: Copper, tin plated  
Part Number: 53610-2  
Foil Crimp Tooling: AMP-O-LECTRIC Machine and Applicator #68238-1

Shield Connector  
For Telephone and  
Power Cable

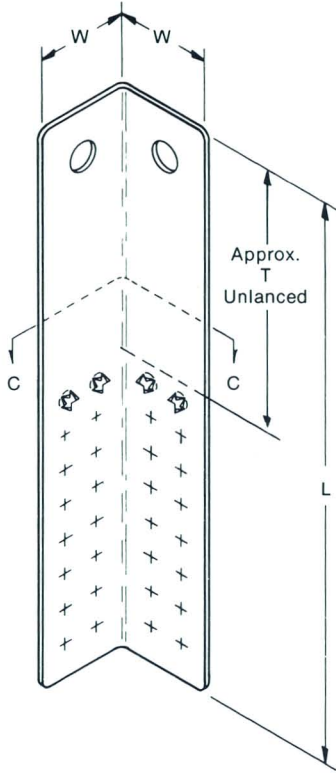


Material and Finish: Brass, tin plated

These connectors are approved by R.E.A. and appear on the R.E.A. list of material acceptable for use on telephone systems of R.E.A. borrowers.

# TERMI-FOIL Terminals and Splices

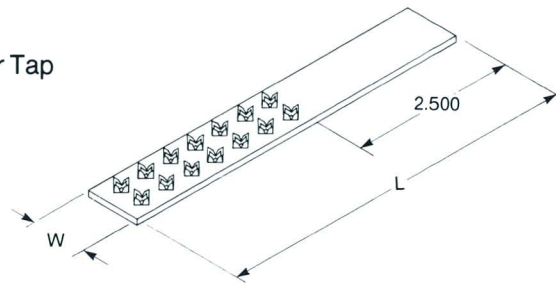
## Large Size End Tap Terminals



Nomo-graph Size	Foil** Thickness	Terminal CMA at C-C	Stud Size	Material and Finish	Dimensions			Part Numbers					
					W	L	T	With Stud Hole	Without Stud Hole				
1	.015 Max.	30,552	—	Unplated Copper	1.000	9.000	4.500	—	53611-2				
						4.000	.875	52342	—				
						4.187	.500	53188-2	—				
						6.000	3.000	329488	—				
						7.500	3.000	53187-2	—				
						9.000	3.000	2-329488-1	—				
				Tin Plated Copper	1.000	12.000	3.000	2-329488-2	—				
						15.000	3.000	2-329488-3	—				
						6.000	3.000	2-329488-4*	—				
						9.000	3.000	3-329488-0*	—				
						12.000	3.000	2-329488-5*	—				
						6.000	3.000	2-329488-6	3-329488-3				
				Unplated Copper	1.000	7.187	.500	—	3-329488-1				
						9.000	3.000	2-329488-7	3-329488-4				
						9.000	4.500	—	5-329488-0				
12.000	3.000	2-329488-8	3-329488-5										
12.000	6.000	—	4-329488-8										
13.187	.500	—	3-329488-2										
2	.020 Max.	45,828	5/16	Unplated Copper	1.000	15.000	3.000	2-329488-9	3-329488-6				
						6.000	3.000	329489	—				
						9.000	3.000	2-329489-1	—				
						9.000	3.000	3-329489-6***	—				
						12.000	3.000	2-329489-2	—				
						15.000	3.000	2-329489-3	—				
				Tin Plated Copper	1.000	6.000	3.000	2-329489-4	3-329489-2				
						9.000	3.000	2-329489-5	3-329489-3				
						12.000	3.000	2-329489-6	3-329489-4				
						15.000	3.000	2-329489-7	3-329489-5				
						6.000	3.000	329490	—				
						9.000	3.000	2-329490-1	—				
				Unplated Copper	1.000	12.000	3.000	2-329490-2	—				
						15.000	3.000	2-329490-3	—				
						6.000	3.000	2-329490-4	3-329490-2				
9.000	3.000	2-329490-5	3-329490-3										
12.000	3.000	2-329490-6	3-329490-4										
15.000	3.000	2-329490-7	3-329490-5										
3	.035 Max.	77,653	3/8	Tin Plated Copper	1.250	6.000	3.000	329491	—				
						9.000	3.000	2-329491-1	—				
						12.000	3.000	2-329491-2	—				
						15.000	3.000	2-329491-3	—				
						6.000	3.000	2-329491-4	3-329491-3				
						9.000	3.000	2-329491-5	3-329491-4				
				Unplated Copper	1.250	12.000	3.000	2-329491-6	3-329491-5				
						15.000	3.000	2-329491-7	3-329491-6				
						6.000	3.000	329491	—				
						9.000	3.000	2-329491-1	—				
						12.000	3.000	2-329491-2	—				
						15.000	3.000	2-329491-3	—				
				4	.045 Max.	143,212	7/16	Tin Plated Copper	1.500	12.000	3.000	2-329491-4*	—
										6.000	3.000	2-329491-5	3-329491-3
										9.000	3.000	2-329491-6	3-329491-4
12.000	3.000	2-329491-7	3-329491-5										
15.000	3.000	2-329491-8	3-329491-6										
6.000	3.000	329491	—										
Unplated Copper	1.500	9.000	3.000					2-329491-1	—				
		12.000	3.000					2-329491-2	—				
		15.000	3.000					2-329491-3	—				
		6.000	3.000					2-329491-4*	—				
		9.000	3.000					2-329491-5	3-329491-3				
		12.000	3.000					2-329491-6	3-329491-4				

\*Unplated 2 1/2" at end with stud hole. †Terminal not bent.  
 \*\*Max. foil thickness for lance penetration.  
 \*\*\*Unplated 3" at end with stud hole.  
 NOTE: All End Tap Terminals can be made available flat for center tapping and with or without stud hole.

## Large Size End or Center Tap Terminals Single Face



### Tooling:

#### End Tapping:

- Power Unit\* w/Head #69980 (dies included)
- Power Unit\* w/Head #69099\*\* (dies 69479-1)
- Power Unit\* w/Head #69082\*\* (dies 69791)

NOTE: Terminal #50854 can be applied as an end tap in Head #69082 (dies 69791) only.

#### Center Tapping:

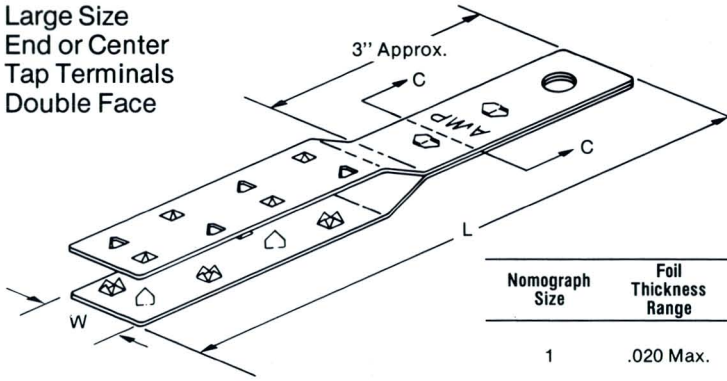
- Power Unit\* w/Head #69962 (dies included)
- \*Refer to back page for specifications and accessories.

\*\*For preparing small groups of samples for evaluation and/or pilot production.

Foil Thickness Range	Terminal CMA at C-C	Material	Dimensions		Part Number
			W	L	
.080 Max.	178,220	Unplated Copper	2.000	6.000	50854
.080 Max.	89,110	Unplated Copper	1.000	6.000	50855

## TERMI-FOIL Terminals and Splices

Large Size  
End or Center  
Tap Terminals  
Double Face



**Tooling:**

**End Tapping:**

- Power Unit\* with Head #69980 (dies included)
- Power Unit\* with Head #69099\*\* (dies 69479-1)
- Power Unit\* with Head #69082\*\* (dies 69791)

**Center Tapping:**

- Power Unit\* with Head #69962 (dies included)

\* Refer to back page for specifications and accessories.

\*\* For preparing small groups of samples for evaluation and/or pilot production.

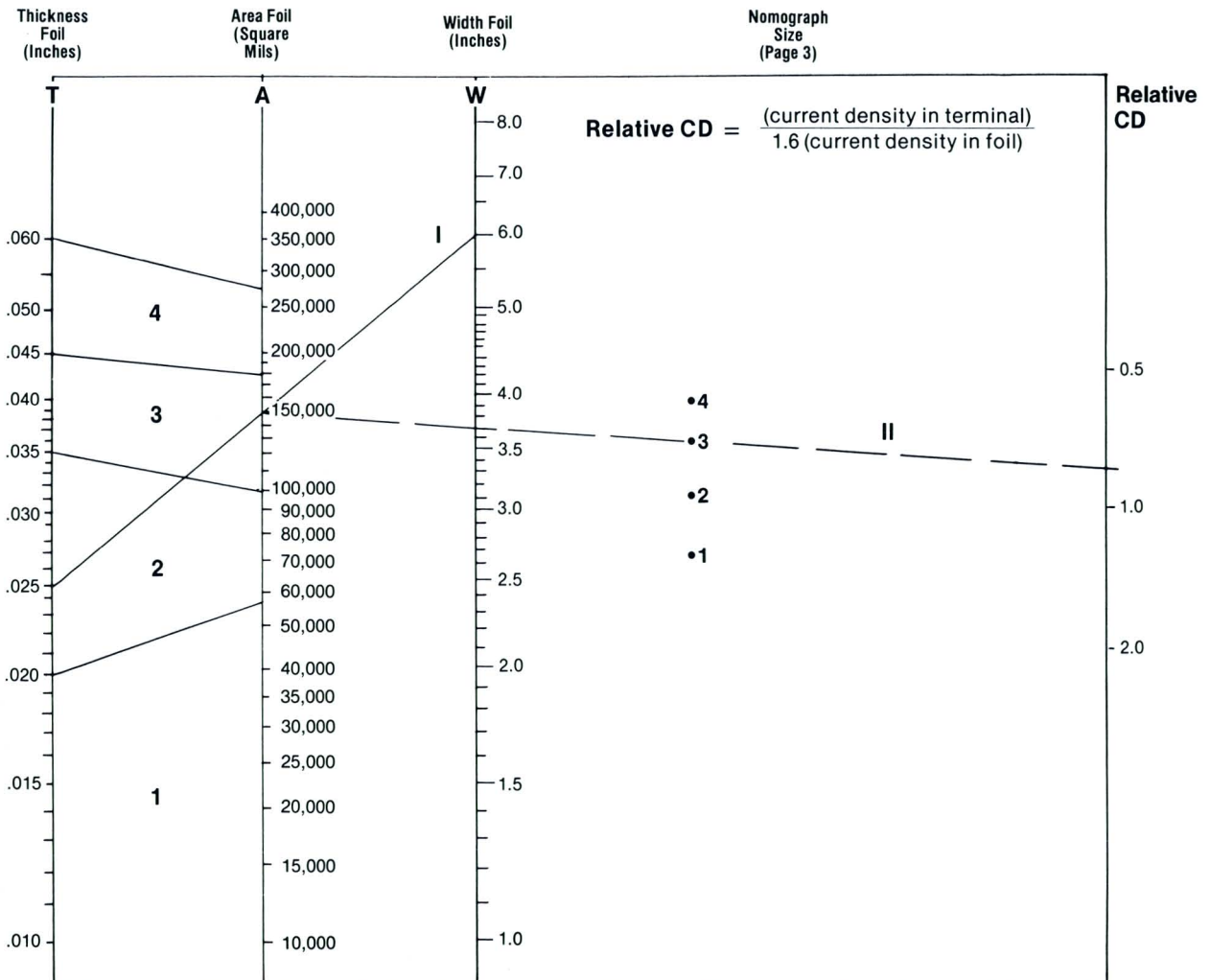
Nomograph Size	Foil Thickness Range	Terminal CMA at C-C	Stud Size	Material and Finish	Dimensions		Part Numbers
					W	L	
1	.020 Max.	45,828	3/8	Tin Plated Copper	1.000	6.910	331927
						10.910	1-331927-0
						14.910	1-331927-1
2	.035 Max.	77,653	3/8	Tin Plated Copper	1.000	6.910	331928
						10.910	1-331928-0
						14.910	1-331928-1

**Nomograph:**

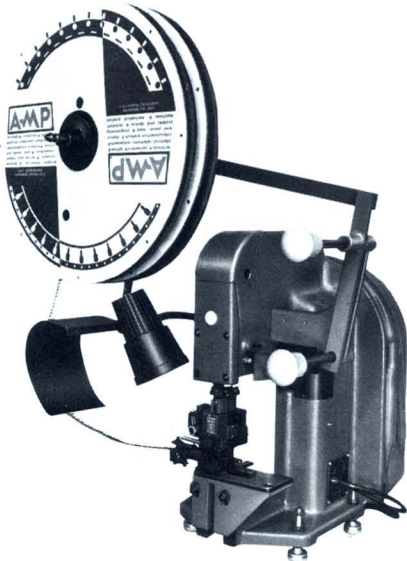
For selection of proper large size TERMI-FOIL Terminals for End Tapping.

**I** Find foil area A from W & T. The highest region on column A touched by Line I denotes the terminal size (1, 2, 3 or 4) which must be used.

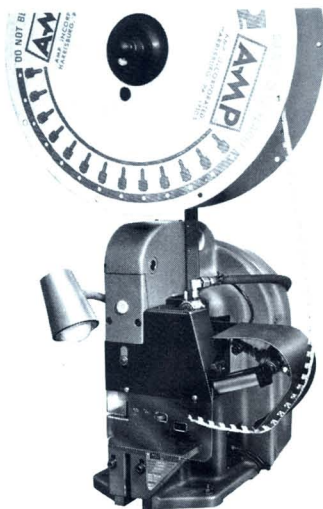
**II** From area A found, pass thru dot corresponding to correct terminal to CD scale, which gives relative current density in the terminal.



**AMP-O-LECTRIC Machine #1-471273-2  
with Applicator #68196-1 and Dies**



**AMP-O-LECTRIC Machine and  
Applicator #68238-1**



**Hand Tool**



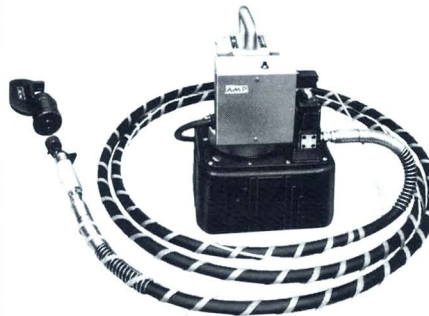
Part Number: 68026

**Pneumatic Tool**



Part Number: 69010

**Electric Hydraulic Power Unit**



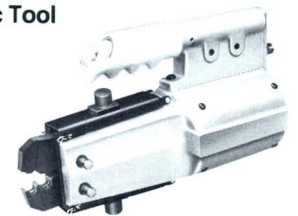
Part Numbers:  
Power Unit Only (includes Pressure Release)

- 115 volts (60 Hz) — 69120-1
- 230 volts (60 Hz) — 69120-2
- 220 volts (50 Hz) — 1-69120-0
- 440 volts (60 Hz) — 69120-4

Power Unit Only (includes Pressure Release: Use with Pressure Handle Control Assembly Only)

- 115 volts (60 Hz) — 69120-9
- 230 volts (60 Hz) — 69120-7

**Pneumatic Tool**



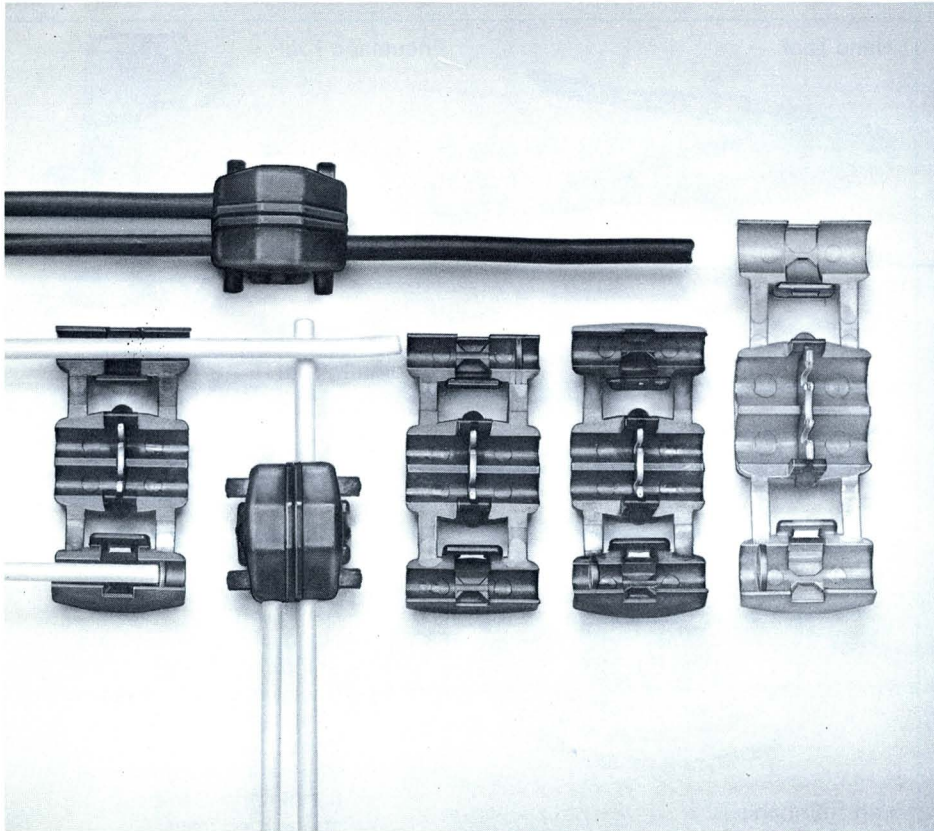
- Part Numbers:
- 68068 — As shown
  - 68068-1 — Handle mounted on side of tool.
  - 68068-3 — Foot pedal. Can be bench mounted or suspended from counterbalance.
  - 68068-4 — Vertical trigger at back of handle grip. Can be suspended from counterbalance.
  - 68068-5 — Jaws normally closed. Time delay foot valve.

**Multi-Directional Valve**



**Accessories for Power Unit (Must be ordered separately)**

Number	Description	Power Unit
59512-5	7' Handle Control Assembly — Hose and Cord	
59512-6	15' Handle Control Assembly — Hose and Cord	
59512-7	21' Handle Control Assembly — Hose and Cord	Pressure Release on Power Unit Only
59512-9	21' Handle Control Assembly — Cord (Less Hose)	
1-59512-5	28' Handle Control Assembly — Hose and Cord	
1-59512-7	50' Handle Control Assembly — Cord (Less Hose)	
68284-1	15' Foot Switch Assembly (needs hose assembly)	69120-1 69120-2 1-69120-0 69120-4
306023-4	3' Hose Assembly	47206
306023-1	7' Hose Assembly	
306023-2	15' Hose Assembly	Crimping Head Coupling needed with these hose assemblies
306023-3	21' Hose Assembly	
59220	3-Way Multi-Directional Valve	
59220-2	3-Way Multi-Directional Valve (Elec. Control)	For use with Foot Switch only
59221	6-Way Multi-Directional Valve	
59221-2	6-Way Multi-Directional Valve (Elec. Control)	
1-59512-3	7' Handle Control Assembly — Hose and Cord	Pressure Release on Handle and on Power Unit
1-59512-2	15' Handle Control Assembly — Hose and Cord	
1-59512-0	15' Handle Control Assembly — Cord (Less Hose)	
1-59512-1	21' Handle Control Assembly — Hose and Cord	
1-59512-6	21' Handle Control Assembly — Cord (Less Hose)	



The AMP ELECTRO-TAP connector is a reliable method for making branch and through-wire taps to solid and stranded wires for a variety of wire ranges. Each connector housing is of a single piece construction and made of nylon. The connectors utilize displacement-type, self-stripping contacts for faster, easier tapping than twist-on or other type splices.

These versatile connectors are suitable for a great variety of both high and low voltage applications. Automotive applications include automobile, bus, truck, and trailer wiring for items such as lights,

horns and gauges, speakers, etc. Other mobile applications include boat wiring systems, trailer wiring, and mobile homes, as well as other recreational vehicles such as campers and ATV's. Higher voltage applications include fixture wiring, industrial wiring, and equipment wiring systems, and may include switching systems, control panel wiring, hobby equipment, and such miscellaneous examples as intercoms, tape decks, stereo and quadraphonic systems, automated equipment, burglar and fire alarms, etc.

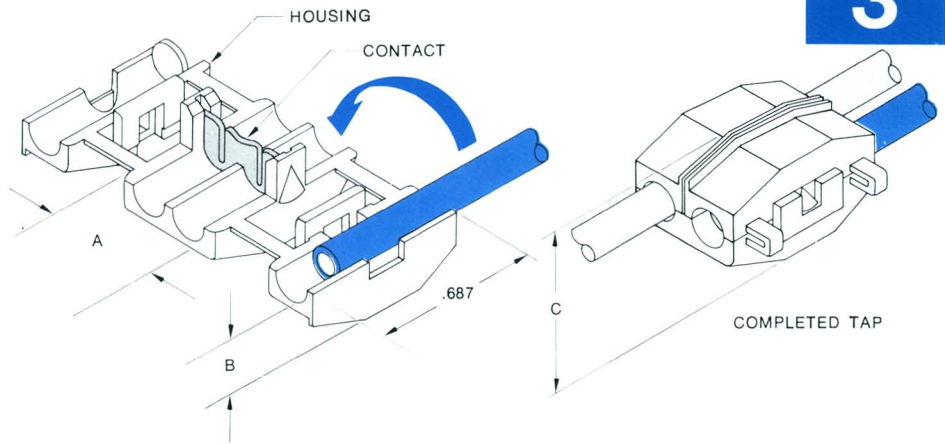
### AMP ELECTRO-TAP Splice

#### Features

- No special tools
- No wire stripping
- May be used for solid and stranded wire
- Single-piece molded nylon housing
- Positive latching assures tap quality
- Small size
- Fast tapping operation
- Economical
- Completely insulated finished tap
- U.L. Listed



**Specifications**



Wire Size Range (AWG)	Max. Wire Ins. Dia.	Dimensions			Color	Part Number
		A	B	C		
22-18	.160	.484	.247	.444	Red	53440-2
18-14	.160	.484	.247	.444	Blue	53440-1
12-10	.260	.697	.260	.520	Yellow	53542-1

**Material:**  
 Housing, nylon  
 Contact, tin-plated brass

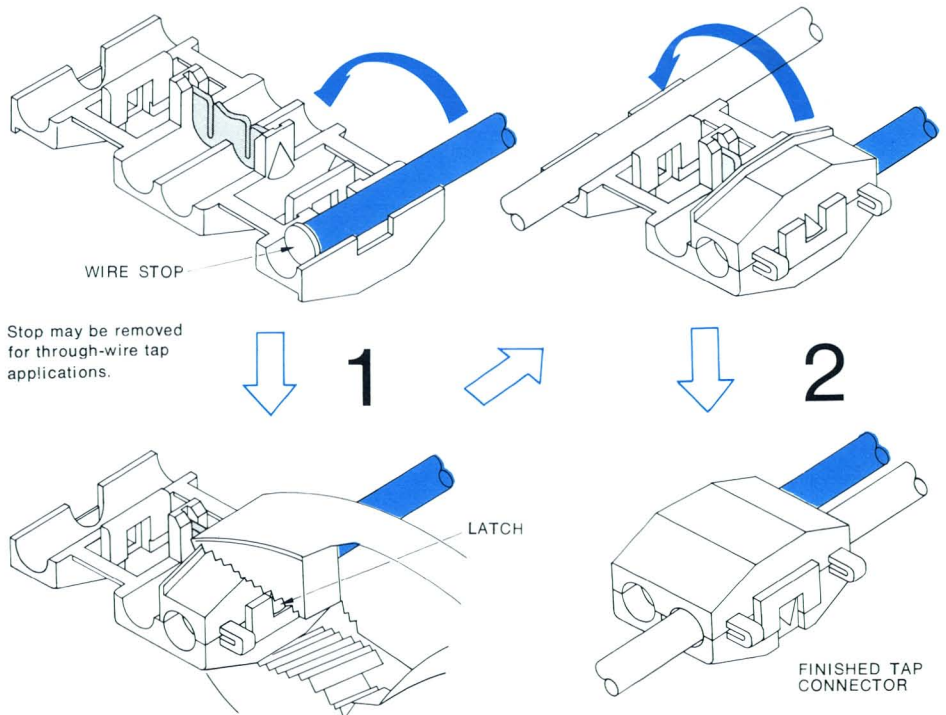
**Operating Temperature:**  
 + 105°C (Max.)

**Weight:**  
 Part No. 53440-2, 1.7 grams  
 Part No. 53440-1, 1.7 grams  
 Part No. 53542-1, 3.0 grams

**Voltage Rating:**  
 300 Volts

**Current Rating:**  
 Equivalent to wire being installed

**Application**



Stop may be removed for through-wire tap applications.

**Easy two-step operation**

1. Simply butt the tap-wire against wire stop, fold top cover half over to meet the base, and squeeze with ordinary pliers until the latch locks.
2. Lay the run-wire in the remaining section, fold over to meet the base, and squeeze to latch as before.

