AMPLIVAR Splices

Product Facts

- Compression crimp eliminates cold solder points, weld burns and wire embrittlement usually connected with thermal-type terminations
- Excellent tensile strength vibration resistant
- Provides a superior electrical connection that is free of many contaminants such as stripper residue and solder flux
- Precision formed, strip-fed splices terminated in automatic machines for high production rates per hour
- High termination rates, low wire consumption and the elimination of rejects caused by solder flux or heat damage results in the lowest applied costs
- Precisely controlled crimp termination helps eliminate human error for maximum reliability
- Splice up to 3 magnet wires together with stranded lead in one barrel

Application s

- Motor windings and connections
- Coil connections
- Transformer windings and connections
- Solid wire connections
- Lighting ballasts
- Power supplies
- Starters and alternators



TE Connectivity offers a full selection of AMPLIVAR splices that are specifically designed to terminate magnet wire to itself or in combination with standard solid or stranded lead wire.

AMPLIVAR splices have machined, sharp edged serrations inside the crimp barrels. These serrations, made by a special production process, pierce the insulating layer of magnet wires in a manner that provides a large contact area.

In a one-step operation the magnet wire is automatically multiple ring-stripped of its

insulation as it is forced into the serrations during the precisely controlled crimp.

The resulting termination produces a high tensile strength, air-sealed connection that is as resistant to corrosion as the insulated conductor.

As many as three magnet wires can be terminated simultaneously in one splice. In addition, copper or aluminum magnet wire, or a combination of both, can be terminated.

When required, copper or aluminum magnet wire can

be combined with standard, pre-stripped solid or stranded lead wires.

Depending on your specific application, AMPLIVAR splices are available in 5, 7 and 9 serration versions for terminations in the 100 to 22,000 CMA range as well as miniature and subminiature designs for terminations in the 100 to 1850 CMA range.

The crimping of AMPLIVAR splices is done by semiautomatic crimping machines for high output per hour production rates.



A Burrs Serrations

Section AA

Stranded Wire



Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents. Dimensions are shown for reference purposes only. Specifications subject to change.



Technical Features

Applicable Types of Wire — Cu, Al (Solid) together or in combination with stranded lead wire

Wire Size Range -

from 300 to 13,000 CMA (0.1 mm² to 6.6 mm²)

Terminal Base Material – Brass, phosphor bronze

 $\begin{array}{l} \textbf{Surface Finish} - \textit{plain and} \\ \textit{tin plated except where noted} \end{array}$

Temperature Range -

-65°C to +150°C

Rated Current — according connected wire size

Rated Voltage — according terminated winding

Test Results

The AMPLIVAR products have been subjected to the following tests without significant millivolt losses.

Temperature Cycling – 25 cycles with each cycle consisting of 30 minutes at +125°C followed by 30 minutes at –65°C

Heat Age - 96 hours at +150°C Thermal Shock - 25 cycles with each cycle consisting of 30 minutes at +150°C followed by 30 minutes at -65°C **Salt Spray** — 96 hours at +35°C with a 5% salt solution spray

Humidity — 96 hours at 90–95% relative humidity and +40°C

Current Cycling — 10,000 cycles with each consisting of 3 minutes on and 3 minutes off at a current (25 A) which establishes a wire temperature

TYPICAL CURRENT CYCLING TEST RESULTS





Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents. Dimensions are shown for reference purposes only. Specifications subject to change.

General Application Guidelines

To assist you in obtaining the optimum AMPLIVAR product termination, the following guidelines are recommended:

- 1. All magnet wires must be placed in the bottom of the wire barrel before crimping. If lead wire is to be crimped in the same termination, it should be placed on top of the magnet wires.
- 2. Wire barrels are designed to accept a maximum of three insulated magnet wires plus stranded lead wires.
- **3.** The ratio of magnet wire diameters crimped in any wire barrel should not exceed 2:1. This ratio is approximately a range from the largest to the smallest magnet wire of six sizes.
- 4. The sum of the circular mil area (CMA) of the magnet wires and any lead wires should not exceed the capacity of the splice.
- **5.** The sum of the diameters of the individual magnet wires plus twice the terminal stock thickness must be equal to or less than the crimp width.

Technical Documents

Application specifications describe requirements for using the product in its intended application and or crimping information. They are intended for the packaging and design engineer and the machine setup person.

114-2002	AMPLIVAR 7- serration pigtail splices	114-2006	AMPLIVAR subminiature pigtail splices
114-2003	AMPLIVAR 9- serration pigtail splices	114-2009	AMPLIVAR 5- serration thru splices
114-2005	AMPLIVAR subminiature thru splices	114-2016	AMPLIVAR miniature pigtail splices

6. Magnet wire of 26 AWG [0.40 mm] or smaller should be used with 7-serration splices having "shallow serrations," and magnet wire of 28 AWG [0.32 mm] or smaller should be used with 9-serration splices having "shallow serrations" (part numbers identified with asterisk [*] are in the tabular data on the following technical pages).

- 7. Magnet wire of 20 AWG [0.81 mm] or larger having an insulation thickness heavier than "single film coated," should not be used with splices having "shallow serrations" (those part numbers marked with an asterisk [*] in the tabular data on the following technical pages).
- **8.** When aluminum magnet wire is used, splices and terminals must be tin plated.
- **9.** Consult TE for splice and terminal selection and recommendations for all non-standard applications.

Suggested Splice Selection Procedure

Use the following guide to help you to determine the proper splice for your application:

- 1. Use 9-serration splices, tin plated when terminating aluminum magnet wire or combinations with aluminum magnet wire.
- 2. Use 9-serration splices for hermetic and severe environment applications.
- **3.** Use splices identified with an asterisk [*] when terminating 7-serration 26 AWG [0.40 mm] or smaller wires and 9-serration 28 AWG [0.32 mm] or smaller wires.
- 4. Calculate the total CMA of the magnet wires plus any lead wires to be terminated. Always use the coated magnet wire for CMA (see pages 90–91).

- 5. Calculate the total magnet wire diameters (see pages 90 and 91).
- 6. Select a splice for trial calculations. It should have the proper CMA range. Plating finish should be considered at this time.
- 7. Calculate the sum of the magnet wire diameters plus two splice stock thicknesses. If this total is less than the crimp width of the splice selected, it may be used. If the total is greater than the crimp width, a splice with a greater crimp width must be selected. Consult TE for special wide tooling recommendations.

Example:

- Selection of a pigtail splice to terminate the following wires:
- One 28 AWG [0.32 mm] copper magnet wire. One 22 AWG [0.64 mm] aluminum magnet wire. One 18 AWG [0.8–0.9 mm²] 19-strand copper lead wire.
- Calculate the total CMA (Procedure 4):

Total	= 2501 CMA
22 AWG [0.64 mm] coated magnet wire 18 AWG [0.8–0.9 mm ²] stranded lead wire	= 708 CMA = 1608 CMA
28 AWG [0.32 mm] coated magnet wire	= 185 CMA

■ Calculate the sum of the magnet wire diameters (Procedure 5):

Select a terminal for trial calculations. Splice No. 62305-2, page 47 (Procedure 6):

CMA range	= 600-3000
Stock thickness	= .016 [0.41]
Crimp width	= .110 [2.79]

9-serration, tin plated for aluminum magnet wire (Procedure 1).

Splice identified with asterisk [*] for 28 AWG [0.32 mm] (Procedure 3).

 Calculate the sum of the magnet wire diameters plus two splice stock thicknesses (Procedure 7):

 $.0402 + (.016 \times 2) = .0722$ $[1.02 + (0.41 \times 2) = 1.84$

.0722 [1.84] is less than the splice crimp width of .110 [2.79]; therefore, Part No. 62305-2 may be used.

Dimensions are shown for reference purposes only. Specifications subject to change.

9 Serrations — **Pigtail Type**

Product Facts (Plus All 7 Serration Facts)

- Splice length is increased on larger CMA splices for improved performance
- Serration depths are varied within the splice to give optimum electrical/ mechanical performance on all wire sizes
- Serration sidewall angles are varied to allow better wire stripping and serration fill
- Flat bottom of splice helps keep magnet wires on bottom as required during crimping
- Magnet wires 28 AWG [0.32 mm] and larger may be terminated without requiring shallow serrations
- Additional serrations enhance stability of crimp

7 Serrations — **Pigtail Type**

given CMA

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AWG/ mm ²	Wire Range Solid Dia.	Wire Range CMA	Stock Thickness	Crimp Width	Dim. L	Material	Part Number
24-18.5 0.26-0.80	.020039 0.55-1.00	400-1500	.016 0.41	.080 2.03	.225 5.72	Tin Plated Brass	62303-2*
22-15.5 0.38-1.54	.028055 0.70-1.40	600-3000	.020 0.51	.110 2.79	.225 5.72	Tin Plated Brass	62304-2
22-15.5 0.38-1.54	.028055 0.70-1.40	600-3000	.016 0.41	.110 2.79	.225 5.72	Tin Plated Brass	62305-2*
18.5-13.5 0.80-2.54	.039071 1.00-1.80	1500-5000	.020 0.51	.110 2.79	.225 5.72	Tin Plated Brass	62306-2
18.5-13.5 0.80-2.54	.039071 1.00-1.80	1500-5000	.016 0.41	.110 2.79	.225 5.72	Tin Plated Brass	62307-2*
15.5-12 1.54-3.46	.055083 1.40-2.10	3000-7000	.020 0.51	.140 3.56	.265 6.73	Tin Plated Brass	62308-2
13.5-10 2.54-4.90	.071098 1.80-2.50	5000-10,000	.025 0.64	.180 4.57	.265 6.73	Tin Plated Brass	62309-2
12-9 3.46-6.38	.083112 2.10-2.85	7000-14,000	.025 0.64	.180 4.57	.265 6.73	Tin Plated Brass	62310-2
10-8 4.90-8.60	.098130 2.50-3.31	10,000-17,000	.030 0.76	.250 6.35	.340 8.64	Tin Plated Brass	62311-2
9-6.5 7.07-9.45	.118137 3.00-3.47	14,000-22,000	.030 0.76	.250 6.35	.340 8.64	Tin Plated Brass	1742898-1

*These splices are recommended for applications using wire size 28 AWG [0.32 mm] or smaller.

¹ Special high force application equipment required.



7 Serrations — Pigtail Type	AWG/ mm ²	Wire Range Solid Dia.	Wire Range CMA	Stock Thickness	Crimp Width	Dim. L	Material	Part Number
i igiui i jpo	22-15.5 0.38-1.54	.028055 0.70-1.40	600-3000	.020 0.51	.110 2.79	.225 5.72	Brass	62000-1
Product Facts	22-15.5 0.38-1.54	.028055 0.70-1.40	600-3000	.020 0.51	.110 2.79	.225 5.72	Brass	62157-1*
Taper on both crimper and anvil improves flex life of	22-15.5 0.38-1.54	.028055 0.70-1.40	600-3000	.020 0.51	.110 2.79	.225 5.72	Tin Plated Brass	62000-2
termination	22-15.5 0.38-1.54	.028055 0.70-1.40	600-3000	.020 0.51	.110 2.79	.225 5.72	Tin Plated Brass	62157-2*
Longer "flat" on tooling improves electrical	22-15.5 0.38-1.54	.028055 0.70-1.40	600-3000	.020 0.51	.110 2.79	.225 5.72	Tin Plated Brass	62200-2 ¹
performance (.125 vs080	18.5-13.5 0.80-2.54	.039071 1.00-1.80	1500-5000	.020 0.51	.110 2.79	.225 5.72	Brass	62040-2
■ Radius on wire entry end	18.5-13.5 0.80-2.54	.039071 1.00-1.80	1500-5000	.020 0.51	.110 2.79	.225 5.72	Tin Plated Brass	62040-1
of splice helps prevent	18.5-13.5 0.80-2.54	.039071 1.00-1.80	1500-5000	.020 0.51	.110 2.79	.225 5.72	Phosphor Bronze	964156-1
mechanical performance	15.5-12 1.54-3.46	.055083 1.40-2.10	3000-7000	.020 0.51	.140 3.56	.225 5.72	Brass	62001-1
Serrations are offset to shoared and to place	15.5-12 1.54-3.46	.055083 1.40-2.10	3000-7000	.020 0.51	.140 3.56	.225 5.72	Tin Plated Brass	62001-2
additional serrations in	15.5-12 1.54-3.46	.055083 1.40-2.10	3000-7000	.020 0.51	.140 3.56	.225 5.72	Tin Plated Brass	62201-2 ¹
"electrical" portion of crimped splice	12-10 2.10-6.0	.085110 2.10-2.85	7000-12,000	.025 0.64	.250 6.35	.225 5.72	Tin Plated Brass	62295-1
Splice CMA ranges are	12-10 2.10-6.0	.085110 2.10-2.85	7000-12,000	.025 0.64	.250 6.35	.225 5.72	Brass	62295-2
overlapped so that two splices are available for any	12-9 2.10-6.38	.085115 2.10-3.47	7000-13,000	.025 0.64	.180 4.57	.225 5.72	Tin Plated Brass	62002-2

*These splices are recommended for applications using wire size 26 AWG [0.40 mm] or smaller.

1 Flat bottom

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change. 47



Α

7 Serrations —

Thru Type

Product Facts

 Crimp bellmouth provides retention in circular cavity slot in bobbin

L'	

AWG/	Wire Range	Wire Range	Stock	Crimp	Dim.	Material	Part
mm ²	Solid Dia.	CMA	Thickness	Width	L		Number
22-15.5 0.38-1.54	.028055 0.70-1.40	600-3000	.020 0.51	.110 2.79	.225 5.72	Tin Plated Brass	1217384-1*

В

*These splices are recommended for applications using wire size 26 AWG [0.40 mm] or smaller.

5 Serrations — Thru Type

Product Facts

- Wide range of thru splice s
- Serrations centered in splic e to achieve optimu m electrical and mechanica I performance in a thru splic e
- CMA range accepts a wid e variety of wire sizes an d combination s



* These splices are recommended for applications using wire size 26 AWG [0.40 mm] or smaller.

1 Increased terminal pitch.

² Increased U-diameter.

5 Serrations — Pigtail Type

Product Facts

- Serration depths are varied within the splice to give optimum electrical / mechanical performance on all wire sizes
- Flat bottom of splice helps keep magnet wires on bottom as required during crimping

Miniature Splice — Pigtail Type

Product Facts

- The miniature AMPLIVAR splice was developed for crimping thinner copper magnet wires having a diameter between .003 and .016 [0.08 and 0.40 mm] and has to be connected with a stranded conductor
- The diameter of one conductor strand should not exceed the magnet wire diameter to be applied

Subminiature Splice — Thru or Pigtail Type

Product Facts

- The compactness of these splices makes them ideal for use in small subfractional motors, transformers, relays, solenoids, indicator lamps and small appliance terminations
- These splices provide the same reliability as the larger AMPLIVAR splices



AWG/	Wire Range	Wire Range	Stock	Crimp	Dim.	Material	Part
mm ²	Solid Dia.	CMA	Thickness	Width	L		Number
20-17 0.50-1.00	.030045 0.80-1.15	1000-2000	.016 0.41	.100 2.54	.225 5.72	Tin Plated Brass	62670-2*1

*These splices are recommended for applications using wire size 26 AWG [0.40 mm] or smaller.

¹ Flat bottom



AWG/ mm ²	Wire Range Solid Dia.	Wire Range CMA	Stock Thickness	Crimp Width	Dim. L	Material	Part Number
27-21 0.10-0.40	.014030 0.35-0.75	200-850	.012 0.30	.055 1.40	.195 4.95	Tin Plated Brass	63431-1
25-18 0.16-0.90	.015045 0.45-1.10	300-1850	.012 0.30	.070 1.78	.195 4.95	Copper-Nickel	61166-1
24-18.5 0.20-0.75	.020039 0.55-1.00	480-1500	.014 0.36	.080 2.03	.195 4.95	Tin Plated Brass	62341-1
 24-18.5 0.20-0.75	.020039 0.55-1.00	480-1500	.014 0.36	.080 2.03	.195 4.95	Brass	62341-2
24-18 0.20-0.80	.020040 0.55-1.00	480-1700	.016 0.41	.070 1.78	.195 4.95	Brass	62044-1



	AWG/ mm ²	Wire Range Solid Dia.	Wire Range CMA	Stock Thickness	Crimp Width	Dim. L	Material	Part Number
	30-26 0.05-0.15	.010015 0.30-0.50	100-300	.010 0.25	.042 1.08	.080 2.03	Tin Plated Brass	63621-2
	24-19 0.26-0.60	.020035 0.55-0.90	400-1300	.016 0.41	.070 1.78	.100 2.54	Tin Plated Brass	62194-2
	24-19 0.26-0.60	.020035 0.55-0.90	400-1300	.016 0.41	.070 1.78	.100 2.54	Gold Plated Brass	62194-4
_	24-19 0.26-0.60	.020035 0.55-0.90	400-1300	.016 0.41	.070 1.78	.100 2.54	Gold Plated Brass	62194-4