




Introduction

As noted, FASTON products meet or exceed industry standards UL-310 listed UL file No. E66717. 

Recognized under the Component Program of Underwriters Laboratories Inc. electrical UL file no. E28476, and E13288 

CSA certified file no. LR 7189A-509 

■ **Produced under a Quality Management System certified to ISO 9001**

A copy of the certificate is available upon request.



The FASTON terminal product line includes Ultra-Fast, Ultra-Fast Plus and Ultra-Pod fully insulated FASTON terminals, as well as Positive Lock receptacles consisting of receptacles, tabs and splices specifically designed for quick connections. FASTON products are grouped according to tab width dimensions in series “312”, “250”, “205”, “187”, “125” and “110”. This product line offers speed of application, uniform reliability and low per line cost. These advantages have made FASTON products the number one choice of many leaders in the appliance and automotive industries. Other industries for FASTON products are computer and peripheral equipment,

industrial controllers, test equipment and telecommunications equipment manufacturers.

Speed of application is achieved through the use of application tools for which a complete line has been developed specifically for these terminals. See application tooling section in back of catalog for general information. Specific rates and capabilities can be obtained by contacting technical support at the numbers listed below.

Precisely controlled crimping specifications for each FASTON terminal allow all connections to perform as specified. Low per line costs are derived from low initial product costs, high application speeds, and plug-in

assemblies of the finished termination. While it's true that we have over fifty years of proven reliability behind our product, we are not content to rest. We are constantly striving to introduce new and improved products to add to our quick connect family. Positive Lock RAST 5 connectors, Ultra-Pod Positive Lock, C-Crimp flags and our ever expanding offering of printed circuit board tabs and receptacles are examples of recent additions to the FASTON product family.

It is our commitment to innovation and continuous improvement that allows the FASTON terminal product line to remain the leader in the industry.

Need more information?

Call Technical Support at the numbers listed in the footer of every page.

Technical Support is staffed with specialists well versed in all Tyco Electronics products. They can provide you with:

- Technical Support
- Catalogs
- Technical Documents
- Product Samples
- Tyco Electronics Authorized Distributor Locations

Check the electronic catalog for the most up-to-date information.

Restriction on the use of Hazardous Substances (RoHS)

At Tyco Electronics, we're ready to support your RoHS requirements. We've assessed more than 1.5 million end items/components for RoHS compliance, and issued new part numbers where any change was required to eliminate the restricted materials. Part numbers in this catalog are identified as:

RoHS Compliant — Part numbers in this catalog are RoHS Compliant, unless marked otherwise. These products comply with European Union Directive 2002/95/EC as amended 1 January 2006 that restricts the use of lead, mercury, cadmium, hexavalent chromium, PBB, and PBDE in certain electrical and electronic products sold into the EU as of 1 July 2006.

NOTE: For purposes of this Catalog, included within the definition of RoHS Compliant are products that are clearly “Out of Scope” of the RoHS Directive such as hand tools and other non-electrical accessories.

NOTE: Information regarding RoHS compliance is provided based on reasonable inquiry of our suppliers and represents our current actual knowledge based on the information provided by our suppliers. This information is subject to change. For latest compliance status, refer to our website referenced at right.

Getting the Information You Need

Our comprehensive on-line RoHS Customer Support Center provides a forum to answer your questions and support your RoHS needs. A RoHS FAQ (Frequently Asked Questions) is available with links to more detailed information. You can also submit RoHS questions and receive a response within 24 hours during a normal work week. The Support Center also provides:

- Cross-Reference from Non-compliant to Compliant Products
- Ability to browse RoHS Compliant Products in our on-line catalog
- Downloadable Technical Data Customer Information Presentation
- More detailed information regarding the definitions used above
- So whatever your questions when it comes to RoHS, we have the answers at www.tycoelectronics.com/leadfree



The Tyco Electronics family of quick connects provides the right product for most applications. All styles provide features to enhance quality and reliability of interconnections. The FASTON product line consists of two mating parts—the receptacle and the tab. Receptacles are available in both straight and flag configurations and come in a variety of sizes. They are designed numerically by a series number that corresponds to the width of the mating tab. There are six series of both straight-on and flag receptacles “312”, “250”, “205”, “187”, “125”, and “110”.

The Products

Product Styles

Flag Receptacles



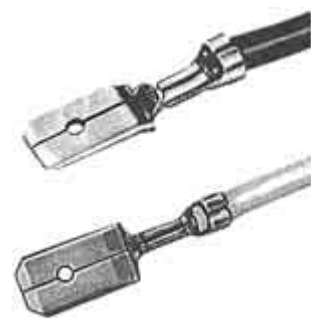
The flag receptacle is a reliable termination for those applications where space is a critical factor. Connection with mating tab is at right-angle to axis of conductor. Typical installations include bussing switches in back-splashes of ranges or in similar heavy duty applications.

Straight Receptacles



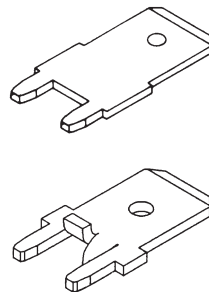
Straight receptacles are made with or without insulation support. Insulation diameters of .040-.230 are accommodated by the insulation support receptacle. Another feature of this type is a step-down insulation support barrel to compensate for insulation thickness to maintain axial alignment of the conductor strands. Over-insertion of shoulderless tabs is prevented by tapering walls at the rear of the receptacle.

Wire Crimp Tabs



The wire crimp tabs are designed for line splices and other special applications. They can be applied to 22-14 AWG wire with “F” crimp termination and include insulation support. The wire crimp tab is also available with AMPLIVAR connector type serrations for magnet wire applications.

Printed Circuit Board Tabs



These tabs are designed to be inserted into holes in PC boards, then attached permanently during the soldering operation. They can be hand inserted or machine inserted using Tyco Electronics application equipment.

Board Mount Tabs



Board mount tabs are available in all the series. These tabs are mounted using rivets or screws through stud holes. They are available in single 90 degree configurations, straight and angled versions, dual versions (90, 45 degree and straight), weld tab versions and special configurations.

Locking Action and Contact Area



Since corrosion and oxidation tend to affect performance by cutting down contact areas and increasing the constriction resistance of connections, maximum contact areas are incorporated in the design of FASTON receptacles and tabs. The design also includes a dimple detent and web section which not only increases contact surfaces but also locks in the tab and receptacles at proper insertion depth for firm retention.

The Products (Continued)

Crimp Styles

The "F" Crimp



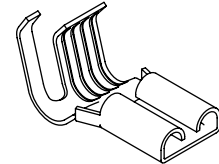
The standard crimp on all straight and certain flag type FASTON terminals is the "F" crimp. Experience over widespread segments of the industry has proved this crimp the most effective way of providing stable electrical and mechanical performance. Applied with match-mated tooling, the "F" crimp offers the optimum combination of mechanical strength and electrical conductivity. This method of termination also provides maximum resistance to vibration and corrosion.

Tab-Lok Crimp for FASTON Flag Terminals



In making this crimp, a tab on the wire barrel, is inserted through a slot in the terminal itself. The crimping action is continued by flattening the tab between two lances which in turn are locked over the tab. The wire connection is locked in to offer reliable electrical and mechanical performance. This receptacle design includes a lance-tab stop at its rear to avoid over-insertion of shoulderless tabs.

The "C" Crimp



A new style crimp with wrap-around barrel design with the standard, reliable FASTON receptacle. The special barrel design provides a maximum contact area and when applied with the matched tooling, will provide reliable electrical and mechanical performance at a minimum terminal profile.

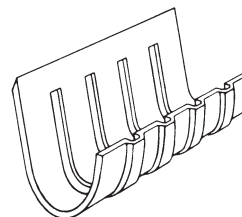
Available in the 187 series for both .020 and .032 thick tabs, brass or phosphorous bronze base materials in either plain or tin plated.

TETRA-CRIMP Terminal Crimp



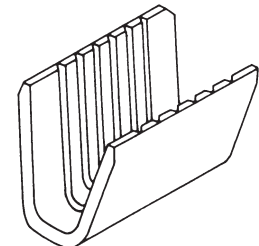
This reliable crimp is used on PIDG FASTON receptacles. The terminals feature nylon insulation fitted over a copper support sleeve. PIDG FASTON receptacles are of the straight variety only, and are available in strip form or tape mounted for high-speed application with automatic crimping machines, or in loose piece form for application with hand tools.

Corrugated Keystone Barrel Serrations



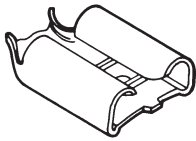
This special terminal wire barrel design provides maximum contact area between terminal and bare conductor. During the crimping process, bulk deformation forces the conductor into these serration channels creating a scrubbing action on oxide film on the wire. The termination is also resistant to vibration and shock.

AMPLIVAR Terminal Crimp



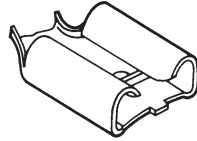
This crimp is designed for reliable, high-speed connection of magnet wire. The conductor(s) is automatically multiple-ring stripped and forced into sharp serrations with a single precision-controlled solderless crimp. This operation produces a strong, air-tight termination that is as resistant to corrosion and many other environmental effects as the insulated conductor itself.

Receptacle Product Lines



Premier

The receptacle configuration of the premier line, with its resilient rolls and double slot bottom allows maximum compliancy while retaining the high normal forces necessary to provide good wiping action and highly reliable interface. The basis to the resiliency of the premier line receptacle is in the *thermal stress relieving* each terminal receives. This extra processing step relieves the residual stresses the stamping process imparts and allows the receptacle to resist the effects of over-stressing, while retaining the normal forces which provide good cleaning action and low, stable resistance under a variety of operating conditions.



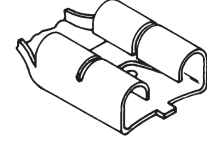
Budget

The budget line receptacles are constructed similar to the premier line and are easily distinguished by the single slot. The single most important difference between the budget line and premier line is that the budget line does not receive the special processing of the premier line. In addition, in the .250 series, the budget line receptacles are constructed of lighter .016 brass.



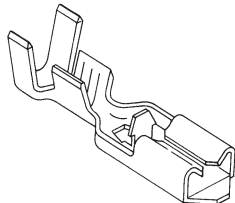
Economy

The economy line receptacle is separated from its counterparts by the large lead-in provided by its flared, relatively low, roll construction. This roll construction and lead-in, with tab contact coming on the mill finish of the brass instead of a profiled edge, makes for lower average insertion forces at relatively high normal forces.



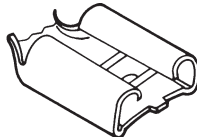
Low Insertion Force

The Low Insertion Force (LIF) type receptacle offers lower insertion forces than the other receptacle styles thru the unique design features of a two-stage receptacle and a cantilever mounted locking dimple.



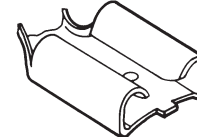
Positive Lock

Positive Lock receptacles are designed with reduced mating forces, and a large locking dimple on a flexible latch. This locking feature acknowledges proper mating with an audible "snap" of the dimple into the mating hole. This enhances safety and reliability of the mated pair for isolated and hard to reach areas. Until the release latch is depressed manually the receptacle cannot be removed.



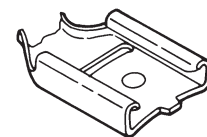
Hermetic

The hermetic receptacle is a premier line receptacle which has been designed to mate with the posted header tabs in hermetic motor applications. This receptacle provides all the features and benefits of the premier line.



Moldable

The moldable receptacle is available in many of the same configurations shown and is produced without slots or openings in the floor of the receptacle to facilitate over-molding.



Commercial

The commercial receptacles, with their abbreviated roll construction, conserve stock, have generally higher insertion forces and somewhat lower tolerance for general abuse.

Test Specifications

Operating Temperatures of Materials and Finishes

FASTON terminals are made available in brass and phosphor bronze which can be plated with tin or silver. The line also includes a selection of nickel plated steel tabs and receptacles.

Certain products are available in either pre-tin or tin plated. Tin plate is the electro-depositing of tin on base metal over the entire surface of the terminal following the fabrication of

the terminal. Pre-tin plate is the plating of tin on base metal prior to fabrication which produces exposed base metal in the terminal edge areas after stamping.

Brass

Plain

Allowable connection temperature* — 110°C.

Plain brass is used frequently, where applications have optimal environmental conditions.

Tin Plated

Allowable connection temperature — 110°C.

Tin plating of receptacle and tab improves operation at higher temperatures, and in addition helps to protect the connection against corrosion.

Silver Plated

Allowable connection temperature — 130°C.

Silver plated connections allow the highest operating temperature for brass and a higher current-carrying capacity.

* Allowable connection temperature is the ambient temperature plus temperature rise of the terminal at normal operating conditions.

Phosphor Bronze

Plain

Allowable connection temperature — 110°C.

Phosphor bronze is used in applications where brass would normally be corroded, for example the various freezing mixtures and ammonias.

Tin Plated

Allowable connection temperature — 110°C.

Tin plating of receptacle and tab improves operation at higher temperatures, and in addition helps to protect the connection against corrosion.

Silver Plated

Allowable connection temperature — 130°C.

Silver plated connections allow the highest operating temperature for phosphor bronze and higher current-carrying capacity.

Steel

Nickel Plated

Allowable connection temperature — 250°C.

This combination allows a reliable connection at high temperatures, for example in stoves, cooking appliances, etc. For optimum performance, these nickel plated receptacles are used with compatible lead wires and tabs that can be welded to heating units.

Plastics (Insulation)

Material Temperature Rating —

The following list shows various plastics and their application temperatures.

High temp. polyamide (nylon)	150°C
Polyamide, (nylon)	125°C
Polypropylene	105°C
Polyester.	90°C
Polyethylene.	75°C
A.B.S.	70°C
PVC.	60°C

Note: For information related to Glow Wire temperature ratings, contact Tyco Electronics Engineering.

Stress Relieving of Brass or Steel Receptacles

The process of stress relieving is unique to Tyco Electronics quick connects and is most commonly used in the production of those receptacles designated as premier line, including Ultra-Fast, Ultra-Fast Plus FASTON and PIDG receptacles. Stress is introduced into copper alloy or steel terminals during the stamping process. When metal strip

is formed into the receptacle, the material is deformed beyond its yield stress to form it into its new shape. This forming operation leaves a residual stress in the grain structure. The orientations and magnitudes of the forming stresses are complex, but can exist in the same direction as the applied load. Thus, residual stresses can reduce the force necessary to open the

receptacle during the tab insertion. Stress relieving the terminal restores the elastic spring properties and improves receptacle performance by reducing the residual stresses. After stress relieving, the receptacle resists opening when a tab is inserted, especially where difficult or awkward mating situations may cause mechanical abuse.

Test Specifications (Continued)

Test Specifications

The following information and related charts are taken from the qualification requirements as defined in UL-310, the safety standard

for electrical Quick-Connect terminals. Throughout this catalog, when a reference is made to a part being UL listed, that part has been

qualified to the standards shown in these charts.

Temperature Rise and Millivolt Drop

The temperature rise and millivolt drop characteristics are the lowest in the industry. They comply with safety requirements and exhibit extreme stability during extended time tests.

When using FASTON terminals, the allowable connection temperatures can be adjusted, based on the application, by considering actual current(s) and related temperature rise,

time at this temperature, humidity, corrosion environment, vibration, base metal, plating (if any), and other environmental considerations.

Test Parameters for FASTON Terminals (Based on UL-310 Temperature Rise and Current Requirements)

Contact Size	Wire Size (Strand Count)	Continuous Current	Intermittent Current	
250 Series	10 (105)	24	48	
	12 (65)	20	40	
	14 (41)	15	30	
	205 Series	16 (26)	10	20
		18 (16)	7	14
		20 (10)	4	8
		22 (7)	3	6
	187 Series	16 (26)	5	10
		18 (16)	4	8
		20 (10)	3	6
110 Series		22 (7)	2	4

Note: This information applies only to UL listed (UL) terminals. A part with a component recognition (CR) status deviates from the electrical or other requirements defined in the UL-310 safety standard.

This table can be used as a guide for selecting a characteristic such as contact size, wire size, or current (either continuous or intermittent operating current) when the other two are known. This table also identifies the possible receptacle sizes available for a given wire size. The continuous current column highlights the maximum current that should be applied to a given receptacle and wire combination to meet a 30°C maximum temperature rise. Intermittent current can be defined as a one hour cycle consisting of 45 minutes on and 15 minutes off. The temperature rise of the connector using the intermittent current on the corresponding wire size will be less than 85° C. The wire used in the testing to meet these electrical requirements is tin plated copper with stranding as indicated above in parentheses for terminals intended for internal wiring connections.

Tensile Strength (forces for crimp pull-out)

Maximum tensile strength of the wire to terminal connection does not insure reliable electrical performance. An acceptable compromise between maximum tensile strength and electrical stability is recommended.

Normally the tensile strength is much greater than the force required to disconnect the tab from the receptacle; therefore, no difficulties or hazards are encountered.

Forces for Crimp Pull-out Test (UL-310 Specification)

Wire Size		Minimum Force	
AWG	(mm²)	pounds	N
22	0.32	8	36
20	0.52	13	58
18	0.82	20	89
16	1.3	30	133
14	2.1	50	223
12	3.3	70	311
10	5.3	80	356

The forces shown for the crimp pull out test represent the minimum force required to separate the wire from the crimped terminal in an axis parallel to the wire exit direction from the contact. This force does not include the holding force of the insulation crimp (if applicable).

Insertion and Withdrawal Forces for Engagement-Disengagement

The UL-310 safety standard defines a broad range for the insertion and extraction value of each connector series. Many of the FASTON product families (such as premier line, budget line, low insertion force type, etc.) have been designed for specific applications and to address forces within the overall range as defined in the chart.

Insertion and Withdrawal Forces for Engagement-Disengagement Test (UL-310 Specification)

Tab Size	First Insertion, Maximum Individual	Force, pounds (N)				
		First withdrawal			Sixth withdrawal	
		Maximum	Minimum		Minimum	
			Average	Individual	Average	Individual
Test Tab and Unplated Connector						
.250 6.30	18 (80)	18 (80)	6 (27)	4 (18)	5 (22)	4 (18)
.205 5.20	15 (67)	20 (89)	5 (22)	3 (13)	3 (13)	2 (9)
.187 4.80						
.125 3.20	12 (53)	14 (62)	3 (13)	2 (9)	2 (9)	1 (4)
.110 2.80						
Test Tab and Tin Plated Connector						
.250 6.30	17 (76)	17 (76)	5 (22)	3 (13)	4 (18)	3 (13)
.205 5.20	15 (67)	20 (89)	5 (22)	3 (13)	3 (13)	2 (9)
.187 4.80						
.125 3.20	12 (53)	14 (62)	3 (13)	2 (9)	2 (9)	1 (4)
.110 2.80						

This chart shows the forces required to engage and disengage a connector from a **plain brass test tab** (tab for mechanical testing as shown in the tab section of this catalog). The force is measured with a testing device capable of holding the reading and providing accurate alignment with slow and steady engagement and disengagement of the connector and test tab.

Vibration Resistance

In applications where conductors are subjected to flexing at termination points, circuit failure is avoided because resistance to vibration is enhanced through Tyco Electronics insulation support, even on conductors with oversized insulation.

Wire Range

FASTON receptacles are available in various wire ranges from 26-10 AWG, depending on series size. The chart below is designed to show our recommended two-wire combinations. Specific wire and insulation combinations should be evaluated for suitability and not all combinations may be appropriate for high speed or automatic termination equipment.

Recommended Two-Wire Combinations

Wire Ranges																
8-10	12-10	14-10	14-12	16-12	16-14	18-12	18-14 (2) 16	(2) 18 (2) 16	18-14	18-16	20-14	20-16 (2) 18	20-16	20-18	22-16	22-18
Two-Wire Combinations																
10-22 ¹	12-22 ¹	14-14	18-16	16-22	18-18	18-18	16-16	16-16	22-18	18-22 ¹	20-22	18-18	20-18	20-20	18-22 ¹	22-20 ¹
10-20	12-20	14-16	18-14	16-20	18-20	18-16	16-22 ¹	18-18	20-18	18-20	20-20	18-20	20-20	20-22 ¹	18-20	22-22
10-18	12-18	14-18	16-16	16-18	16-22 ¹	18-14	16-20	16-18 ¹	18-18	18-18	20-18	20-20	22-18 ¹	22-22	20-20	
10-16	12-16	14-20	14-22 ¹	16-16	16-20	18-20	16-18		20-20	20-20	20-16	22-20	22-22		20-22	
10-14	14-16	14-22	14-20	18-18	18-22	18-18			20-16	18-22	18-22 ¹	22-20				
	12-14	14-14	16-16	18-20	16-22	18-20			22-16 ¹		18-18					
		14-12	16-18	18-14	16-20	18-22					18-16					
			16-12	20-14	16-16	20-20					16-22 ¹					
			18-12		14-22 ¹	20-22										
			20-12	22-14 ¹	14-20											
			22-12 ¹													

¹ Min./max. wire size combinations