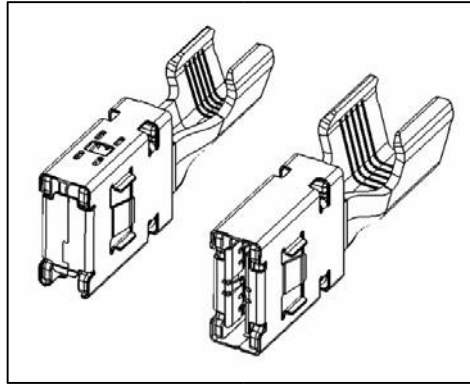


PCON12 Terminal System

Crimping for 5-8mm² and 10-16mm² wire diameters



<u>LTR</u>	<u>REVISION RECORD</u>	<u>DRAWN</u>	<u>APPROVAL-ROUTE</u>	<u>DATE</u>
A	ECR-18-01184 / ECR-18-012427	M.KUMAR	AT/JS/DB/WS	08.08.2018
A2	Spec. Chgs: Sec 3.1 Fig 1 /Table 3	WS	AT/WS	09.28.2018
A3	Applicator p/n corrected in Table 3	WS	AT/WS	11.05.2018
A4	Add FLY and FLRY wire types	WS	AT/WS	02.27.2019
A5	Add bulk handling note	WS	AT/WS	03.22.2019
A6	Added 16mm ² Coroplast Cable	PK	YS	06.10.2020
A7	Added crimp tooling on Page 10 and Note 5 on Page 11	PK	YS	07.18.2022



Table of Contents

1.	Scope	3
2	Applicable documents	3
2.1	Additional customer information	3
2.2	National & international Standards	3
2.3	Bulk Handling	4
3	Description	4
3.1	Contact system - for wire crimp application	4
3.1.1	Contact system variants - for applications without insulation crimp	5
4	Wire	5
4.1	Wire selection.....	6
4.2	Wire preparation.....	6
5	Requirements of the crimped contact	7
5.1	Wire crimp	7
5.1.1	Conductor position	7
5.1.2	Crimp data	7
5.1.3	Cross sections.....	8
5.1.4	Wire pull-out forces	8
5.1.5	Bellmouth	8
5.2	Contact area.....	8
5.3	Shape and angular tolerances	9
6	Subsequent processing of crimped contacts.....	10
7	PCON12 Terminal System crimp data.....	10



1. Scope

This specification contains the guidelines for processing the PCON12 contact system.

Generally, the guidelines according to TE Application Specification 114-18022 are valid. Definitions which differ from this are mentioned here specifically and are valid prior to 114-18022.

This instruction is primarily intended for automatic or semi-automatic application of all mentioned versions. It may be applied, to hand tools if the use has been agreed upon by TE engineering and external customer(s).

Contacts, wires and crimp tooling are made for specific purposes. The usage of the correct components for the specific application must be ensured by the harness maker.

The various contact types are listed in Table 3 and they are sorted by wire range.

2 Applicable documents

The following documents are part of this specification. In case of a conflict between the requirements of this specification and the product drawing or the referenced documents, this specification has priority.

- Customer Drawing: See P/N 2840573 and 2840575 at: www.te.com
- 108-32193 Product specification. Describes the terminal characteristics and their electrical and mechanical performances.
- 114-18022 General guidelines for application of contacts with open crimp barrels.
- 114-18022-10 Making and evaluation of cross sections for F-Crimp terminations.
- 408-7424 Checking the terminal crimp height or gaging the die closure.
- 408-35048 / Instruction Sheet for HV Modular Die Holders 408-35049
- 1-1773864-9 Applicators
- 107-18064 Packaging Requirements / Storage Conditions of TE Connectivity Products

2.1 Additional customer information

Crimp technology training, information at: Application Tooling customer support:

<http://www.te.com/usa-en/products/terminals-splices/intersection/2d-crimp-technology.html>

Application Tooling, Hand Tooling, Machines and further application equipment:

<http://www.te.com/usa-en/products/application-tooling.html>

OCEAN Applicator/Terminal Lookup Tool:

<https://www.te.com/usa-en/products/application-tooling/applicators.html?tab=pgp-story>

2.2 National & international Standards

SAE/USCAR-2 Rev 6 Performance Specification for Automotive Electrical Connector Systems

SAE/USCAR-21 Rev 3 Performance Specification for Cable-To-Terminal Electrical Crimps

ISO6722-1:2011/
Cor.1:2012(E) Technical corrigendum1 to ISO6722-1:2011
Road vehicles – 60 V and 600 V single-core cables

DIN EN 60352-2 Solderless connections – Part 2 Crimped connections
(general requirements, test methods and practical guidance)

LV112-1: 2007-01 Electrical cables for motor vehicles (copper, single-core, unscreened)

LV112-4: 2010-04-21 Electrical cables for motor vehicles (copper alloy, single-core, unscreened)

LV214-1, -3: 2010-03 Motor Vehicle Connectors, Test Matrix and Test Procedures

LV214-2: 2007-10 Motor Vehicle Connectors, Slow Motion Test

2.3 Bulk Handling

The Terminals are packaged and shipped in containers, separated by individual pockets to protect them from damage.

To ensure the Terminals perform reliably, it is recommended to avoid bulk handling and keep the parts in the containers until point of use.

3 Description

The following terms shown below are used in this specification. The variants of the contact system are shown exemplary and schematically.

3.1 Contact system - for wire crimp application

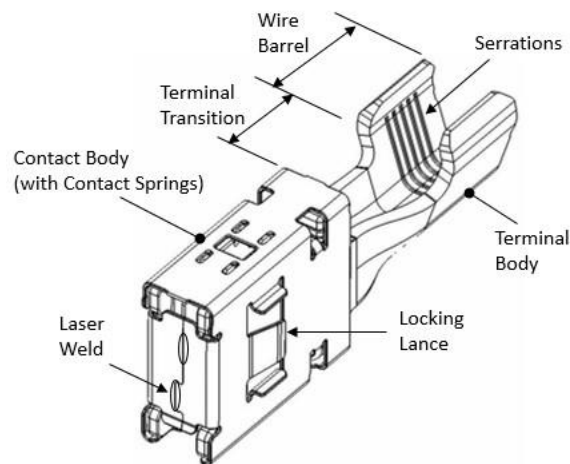


Fig 1: Contact system (1-2840573-2 shown)

3.1.1 Contact system variants - for applications without insulation crimp

The PCON terminals have 4 variants, differentiated by wire size range (Grip A/B) and contact engagement (coaxial and normal). These variants are intended for stranded wire crimping only, within the specified ranges as defined in Section 7, Table 3.

The terminal system does not require insulation crimping and must follow the configuration as shown in Section 4.2, Fig 2.

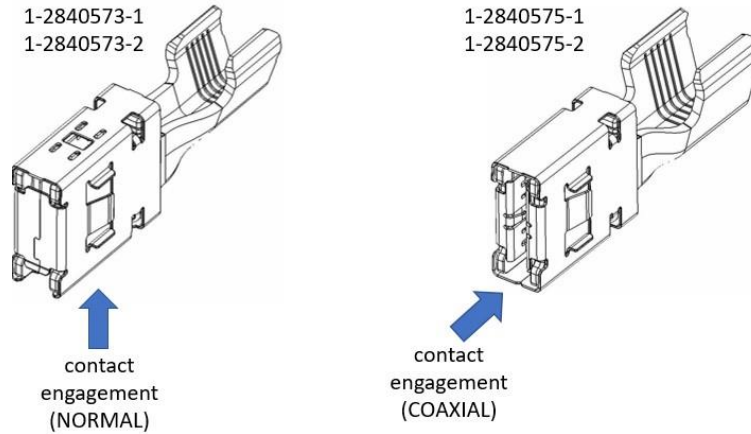


Fig 2: Contact variants

4 Wire

Table 1: Qualified wires

Nom. Wire size [mm ²]	Wire type	No. of strands	Supplier	Valid for: Terminal P/N
5	• ISO 6722	37	Judd Wire Inc.	1-2840573-1 1-2840575-1
6	• FLY	84	NKT or LEONI	
8	• FLRY (Thin Wall)	50		
10	• ISO 6722	63	Judd Wire Inc.	1-2840573-2 1-2840575-2
	• FLY • FLRY (Thin Wall)	80	NKT or LEONI	
12	• ISO 6722	154	Judd Wire Inc.	
16	• ISO 6722	105		
		512		
	• FLY • FLRY (Thin Wall)	126	NKT or LEONI	

4.1 Wire selection

The PCON12 contact system is released for the application with ISO 6722 in accordance with USCAR-21 Rev3, USCAR-2 Rev 6, LV112-1 and LV214-4 and LV214-3.

Furthermore, the PCON12 contact system is released for the application of Thick Wall, Thin Wall, Ultra-Thin Wall wires in accordance ISO6722, considering that their minimum wire size fulfils the geometrical requirements according to USCAR-21 Rev3 and USCAR-2 Rev 6, LV112-1, LV214-1 and LV214-3.

Fine stranded and superfine stranded wires (i.e. wire construction type C) are excluded unless specified in Table 1.

More details regarding the qualified wires are given in Table 1.

The released contact-wire-combinations are given in Table 3.

Other wires require the approval of the TE engineering department.

The wires are applied as single wire terminations. Double terminations are not intended.

4.2 Wire preparation

The wire must be stripped before crimping. A stripping length recommendation with tolerance is given in Section 7 Table 3. Wire stripping is chosen to satisfy the requirements of the position of the wire end and position of the insulation with respect to the crimp. Uneven cuts of insulation may not remain on the conductor.

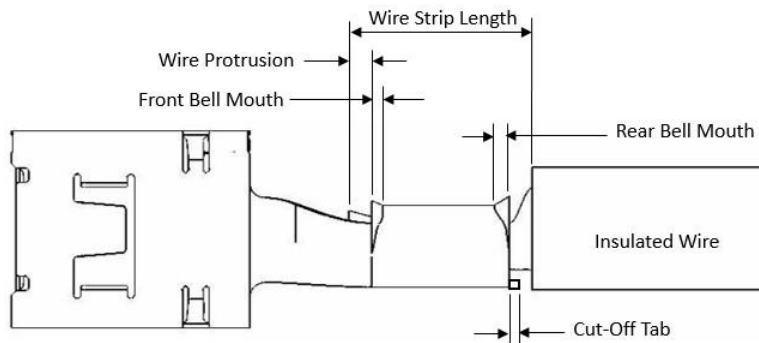


Fig 2: Wire preparation

Single strands may not be damaged, bent, cut or pulled out. Furthermore, the operator should avoid touching the bare single strands. Frayed strands, or sticking out strands, are not permitted. The single strands of the conductor may not be twisted.



5 Requirements of the crimped contact

5.1 Wire crimp

5.1.1 Conductor position

The single strands of the conductor are clamped in the wire barrel. Single wires sticking out or on top are not permitted.

The wire end must be visible at the front end of the wire crimp and may not protrude more than 2.0mm. Under no circumstances may insulation material be crimped into the wire crimp.

Loose single strands of the conductor either upwards, sideways, or protruding over the wire barrel are not permitted, especially if they interfere with a contact locking feature.

5.1.2 Crimp data

The crimp form, height and width, including their corresponding tolerances as well as wire sizes are given in Section 7 Table 3.

The crimp height is a key quality feature of a crimp connection. The measurement is a non-destructive examination and a continuous process inspection. It is provided for every wire size and contact. The crimp height and width shall be performed by mechanical operated measurements. It may also be measured in a cross-section image.

During the application process the crimp height must be checked. This is valid for each batch and after every change or switchover of packaging or wire bundle or applicator regardless of its setup or components.

5.1.3 Cross sections

When creating cross-sections, the correct grinding layer must be between, and not through, the serration (Fig. 3)

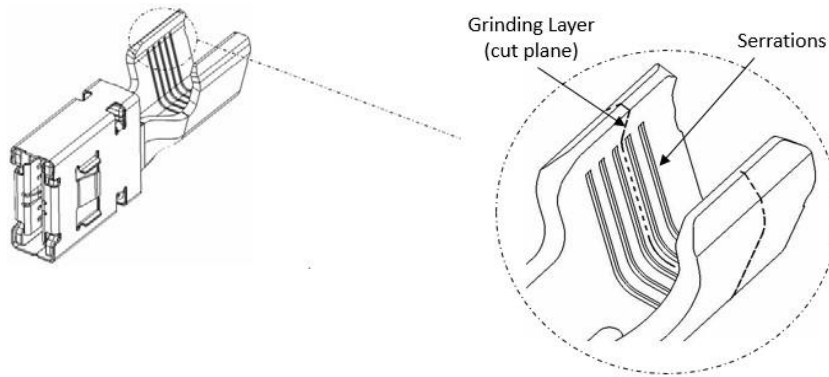


Fig 3: Cross section grinding layer

5.1.4 Wire pull-out forces

The pull-out forces must fulfil the requirements according USCAR-21 Rev3

5.1.5 Bellmouth

At the rear edge of the wire crimp (wire side) a bell mouth is required. A front bellmouth is allowable but not required.

The rear bell mouth length is grouped according to wire size, and may be taken from the following from Table 2.

Table 2: Bell mouth

Wire Size (mm ²)	Bellmouth Length (mm)
5- 8	0.6 ±0.3
10-16	1.0 ±0.5

5.2 Contact area

Locking lances, contact springs and contact body may not be bent, damaged or deformed after crimping. Further processing of the crimped contact requires that locking lances, contact springs and contact body are

not damaged or deformed by external factors. The contact must be able to be inserted freely to the bottom of the housing or to the stop position.

5.3 Shape and angular tolerances

Measuring the shape and position deviation is not always necessary. If the contact is obviously straight by eye then a simplified shape and position test can be performed by inserting it into a suitable housing cavity. The contact must be locked floating in the cavity.

The bend of the terminal within the crimp area must not exceed 3° about its centerline as shown in Fig. 4.

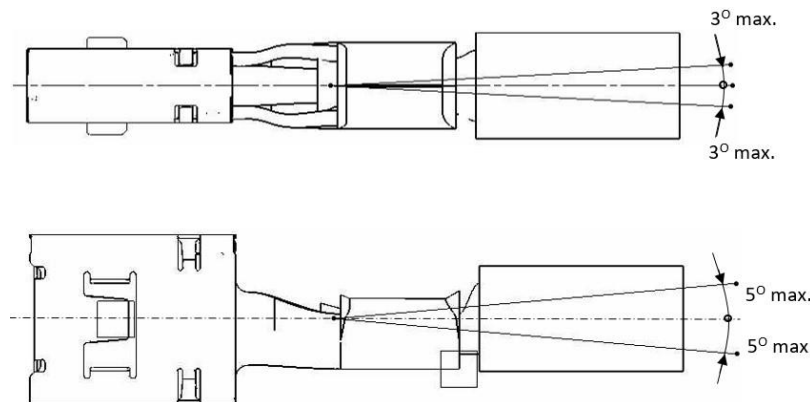


Fig 4: Bend and twist

In case a measurement is required, the following measuring equipment is recommended: X-Y-Coordinate-Reading-Microscope with a 10-time resolution measuring precision to the related measurement indicator.

Due to the limits of the cavity the width of the entire crimp may not exceed the dimension Cb_1 according to Section 7 Table 3.

If contacts are bent during the application process exceeding the specification limits they must be rejected. These contacts are not to be bent back into proper shape.

Meeting the specific shape and position tolerances must be ensured before the contact is inserted into the housing.

6 Subsequent processing of crimped contacts

The requirements according to 114-18022, chapters 7 and 8, are valid.

7 PCON12 Terminal System crimp data

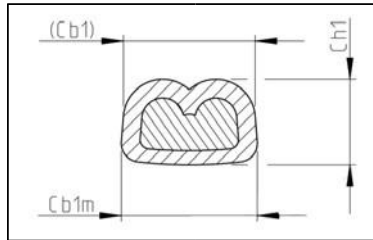


Fig 6: Wire crimp measurement

Table 3: Contact-Wire combination

Variants	Terminal		Wire			Crimp			Processing tool	
	Part Number	Diameter Range	Nom. Wire size	Type	Stripping length	Crimp profile width	Measurable crimp width	Crimp height	Type	Applicator
		[mm]			[mm ²]	(2)	(1)	(3)	(4) (5)	
					[mm]	Cb1	Cb1m	Ch1		
					[mm]	[mm] (inch)	[mm]	[mm]		
Grip A	1-2840573-1 1-2840575-1	N/A	5	• ISO 6722	9.5 ±0.2	5.59 (0.220)	5.59 +0.6	3.65 ±0.10	F	2276163-1 OR 2305860-1
			6	• FLY				3.75 ±0.10		
			8	• FLRY (Thin Wall)				4.00 ±0.10		
Grip B	1-2840573-2 1-2840575-2	N/A	10	• ISO 6722 • FLY • FLRY (Thin Wall)	12 ±0.2	7.11 (0.280)	7.11 +0.7	4.10 ±0.10	F	2276164-1 OR 2305855-1
			12	• ISO 6722				4.30 ±0.10		
			16	• ISO 6722 • FLY • FLRY (Thin Wall)				4.60 ±0.10		



- 1) The measurable crimp widths (Cb1) and (Cb1m) may be used to check whether the correct crimp profile widths were used. They are not inspection dimensions.
- 2) The stripping length is only a reference dimension. If necessary, it must be adjusted as per Section 4.2 Fig: 2 and meet all the requirements of USCAR-21 Rev 3 sec 4.2.5 -9.
- 3) The crimp height (Ch1) is only a reference dimension, even if a tolerance is given. The crimp height must be adjusted by the operator depending on the wire used. The preference is the bending test according to USCAR-2 Rev 6 sec. 5.2.2. Max. parameters must be met due to cavity dimensions.
- 4) Refer to TE Engineering, Section 2 'Applicable Documents 408-305048 / 408-305049' for further information on Applicator tooling selection.
- 5) 2276163-1 & 2276164-1 work with GII+ terminator. 2305860-1 & 2305855-1 work with HV 20 or HF 20 terminator.