

BS EN 61210:2010



BSI Standards Publication

Connecting devices — Flat quick-connect terminations for electrical copper conductors — Safety requirements

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National foreword

This British Standard is the UK implementation of EN 61210:2010. It is derived from IEC 61210:2010. It supersedes BS EN 61210:1995, which will be withdrawn on 1 November 2013.

The CENELEC common modifications have been implemented at the appropriate places in the text and are indicated by tags (e.g. [C] [C]).

The UK participation in its preparation was entrusted by Technical Committee PEL/23, Electrical accessories, to Subcommittee PEL/23/2, Connecting devices.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Compliance with a British Standard cannot confer immunity from legal obligations.

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Amendments/corrigenda issued since publication

Date	Text affected
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English version

**Connecting devices -
Flat quick-connect terminations for electrical copper conductors -
Safety requirements
(IEC 61210:2010, modified)**

Dispositifs de connexion -
Bornes plates à connexion rapide pour
conducteurs électriques en cuivre -
Exigences de sécurité
(CEI 61210:2010, modifiée)

Verbindungsmaterial -
Flachsteckverbindungen für elektrische
Kupferleiter -
Sicherheitsanforderungen
(IEC 61210:2010, modifiziert)

This European Standard was approved by CENELEC on 2010-11-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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CENELEC

European Committee for Electrotechnical Standardization
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Foreword

The text of document 23F/200/FDIS, future edition 2 of IEC 61210, prepared by SC 23F, Connecting devices, of IEC TC 23, Electrical accessories, was submitted to the IEC-CENELEC parallel vote.

A draft amendment was prepared by the Technical Committee CENELEC SR 23F, Connecting devices and was submitted to formal vote.

The combined texts were approved by CENELEC as EN 61210 on 2010-11-01.

This European Standard supersedes EN 61210:1995.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN and CENELEC shall not be held responsible for identifying any or all such patent rights.

The following dates were fixed:

- latest date by which the EN has to be implemented
at national level by publication of an identical
national standard or by endorsement (dop) 2011-11-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2013-11-01

This European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association.

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61210:2010 was approved by CENELEC as a European Standard with agreed common modifications.

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60068-1	1988	Environmental testing - Part 1: General and guidance	EN 60068-1 ¹⁾	1994
IEC 60352-2	2006	Solderless connections - Part 2: Crimped connections - General requirements, test methods and practical guidance	EN 60352-2	2006
ISO 1456	2009	Metallic and other inorganic coatings - Electrodeposited coatings of nickel, nickel plus chromium, copper plus nickel and of copper plus nickel plus chromium	EN ISO 1456	2009
ISO 2081	2008	Metallic and other inorganic coatings - Electroplated coatings of zinc with supplementary treatments on iron or steel	EN ISO 2081	2008
ISO 2093	1986	Electroplated coatings of tin - Specification and test methods	-	-

¹⁾ EN 60068-1 includes A1 to IEC 60068-1 + corr. October 1988.

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CONNECTING DEVICES – FLAT QUICK-CONNECT TERMINATIONS FOR ELECTRICAL COPPER CONDUCTORS – SAFETY REQUIREMENTS

1 Scope

This International Standard applies to non-insulated flat quick-connect terminations consisting of a male tab of size 2,8 mm, 4,8 mm, 6,3 mm or 9,5 mm with hole or dimple detents and a mating female connector for use as either an incorporated or an integrated part of an equipment or of a component, or as a separate entity. This standard establishes uniform requirements for the dimensions, performance characteristics and test program.

The connected electrical copper conductors shall be flexible or rigid stranded, having a cross-sectional area up to and including 6 mm² or rigid solid having a cross-sectional area up to and including 2,5 mm². This standard shall not be used for connecting aluminum conductors.

The rated voltage shall not exceed 1 000 V a.c. with a frequency up to and including 1 000 Hz, and 1 500 V d.c., and having the temperature limits applicable to materials used within this standard.

NOTE 1 This standard, where applicable, may be used for conductors made of material other than copper.

NOTE 2 For reasons of safety, it is recommended that flat quick-connect terminations beyond the scope of this standard should not be interchangeable with those of this standard.

NOTE 3 This standard does not apply to female connectors with positive locking means.

NOTE 4 The flat quick-connect terminations covered by this standard are not intended to be disconnected by pulling on the cable.

NOTE 5 Annex D provides additional information on non international units.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60068-1:1988, *Environmental testing – Part 1: General and guidance*

IEC 60352-2:2006, *Solderless connections – Part 2: Crimped connections – General requirements, test methods and practical guidance*

ISO 1456:2009, *Metallic and other inorganic coatings – Electrodeposited coatings of nickel, nickel plus chromium, copper plus nickel and of copper plus nickel plus chromium*

ISO 2081:2008, *Metallic and other inorganic coatings – Electroplated coatings of zinc with supplementary treatments on iron or steel*

ISO 2093:1986, *Electroplated coatings of tin – Specification and test methods*

3 Terms and definitions

For the purpose of this document the following terms and definitions apply:

3.1

flat quick-connect termination

electrical connection consisting of a male tab and a female connector which can be inserted and withdrawn with or without the use of a tool

3.2

male tab

that portion of a flat quick-connect termination which receives the female connector

3.3

male test tab

male tab manufactured with tighter tolerances for the specific purpose of conducting mechanical tests with production female connectors

3.4

female connector

that portion of a flat quick-connect termination which is pushed onto the male tab

3.5

detent

dimple (depression) or hole in the male tab which engages a raised portion on the female connector to provide a latch for the mating parts

3.6

maximum permissible temperature

maximum service temperature

highest temperature which the flat quick-connect termination is allowed to attain in normal use

4 Main characteristics

4.1 Flat quick-connect terminations are classified into sizes according to the nominal width and thickness of the male tabs. This standard covers the following nominal sizes:

- 2,8 mm × 0,5 mm
- 2,8 mm × 0,8 mm
- 4,8 mm × 0,5 mm
- 4,8 mm × 0,8 mm
- 6,3 mm × 0,8 mm
- 9,5 mm × 1,2 mm

NOTE Relationship between millimetres and inches is shown in Table D.2.

4.2 The preferred conductor cross-sectional areas shall be 0,2 mm², 0,34 mm², 0,5 mm², 0,75 mm², 1,0 mm², 1,5 mm², 2,5 mm², 4,0 mm² and 6,0 mm².

NOTE The approximate equivalent relationship between cross-sectional area in mm² and AWG sizes is shown in Table D.3.

5 Marking and information

5.1 The manufacturer of male tabs and/or female connectors supplied separately and the manufacturer of the component with integral tabs and/or female connectors shall provide adequate information to ensure that the flat quick-connect termination can be applied in the intended manner and that the testing authority can perform the relevant tests in accordance with this standard.

5.2 This information shall be provided in the following methods, as detailed in 5.3:

- by marking (Ma)

The information shall be clearly and indelibly marked on the male tab and on the female connector.

NOTE In the case of integral tabs (e.g. in switches for appliances) the marking may be located on the switch itself.

- by documentation (Do)

The information shall be provided by a separate document, which may consist of a leaflet, label or a specification sheet, supplied with the smallest package unit or supplied separately. The content of the document shall be available to the end user or to the component or equipment manufacturer and to the testing authority, as appropriate, in any suitable format. The format in which this information is presented is not within the scope of this standard.

- by declaration (De)

This information shall be provided to the testing authority for the purpose of testing and in a manner agreed between the testing authority and the manufacturer.

5.3 The following information shall be supplied by the methods indicated.

- a) Manufacturer's name or trade mark Ma (see note 1)
- b) Type reference..... Do (see note 2)
- c) Nominal series designation (size: width and thickness, see 4.1).. Do (see note 2)
- d) Maximum permissible temperature if higher than 85 °C..... Do (see note 3)
- e) The most onerous combination of the tab and the female connector Do
- f) Type of conductor(s) for which that part of the termination is suitable.....Do
- g) Conductor cross-sectional area for which that part of the termination is suitable Do
- h) The recommended method of attaching the conductor to the termination (i.e. tool, stripping length, any special preparation, etc.) Do
- i) The material(s) and type of coating De

NOTE 1 The information for integrated tabs or female connectors may be given together with the equipment or component.

NOTE 2 An appropriate code may be used for this information.

NOTE 3 The insulation of the cable and of the contact-carrying plastic parts should be compatible with the declared maximum permissible temperature.

NOTE 4 In Japan, tab thickness marking on the female connector is 5 for 0,5 mm and 8 for 0,8 mm.

6 Constructional requirements

6.1 Flat quick-connect terminations shall be so designed and constructed that in normal use their performance is reliable and without danger to the user or surroundings.

Compliance is checked by the tests of 8.1 to 8.6.

6.2 Male tabs and female connectors shall be of a metal having mechanical strength, electrical conductivity and resistance to corrosion adequate for their intended use.

Compliance is checked by inspection, by the tests of 8.1 to 8.6 and, if necessary, by chemical analysis.

Examples of suitable metals, when used within the permissible temperature range and under standard atmospheric conditions, are

- copper (for tabs only);
- an alloy containing at least 58 % copper for parts made from rolled sheet (in cold condition) or at least 50 % copper for other parts;
- stainless steel containing at least 13 % chromium and not more than 0,09 % carbon;
- steel provided with an electroplated coating of zinc (for earthing conductors only), according to ISO 2081;
- steel provided with an electroplated coating of nickel, according to ISO 1456;
- steel provided with an electroplated coating of tin, according to ISO 2093.

NOTE The choice of material and coating is left to the relevant product committees who should consider the pollution conditions occurring in the equipment or component where the flat quick-connect termination is mounted.

6.3 The dimensions of male tabs shall comply with those specified in Table 1 and Figures 1, 2, 3 and 4 where the dimensions A, B, C, D, E, F, J, M, N and Q are mandatory.

NOTE 1 The shapes of the various parts may deviate from those given in the figures, provided that the specified dimensions are not influenced and the test requirements are complied with, for example: corrugated tabs, folded tabs, etc.

NOTE 2 Dimensions of male tabs in inches are shown in Table D.4.

Compliance is checked by inspection and measurement.

6.4 The dimensions of female connectors shall comply with those specified in Table 2 and Figure 5 where L_2 , B_3 and 1,5 mm maximum are mandatory.

NOTE Dimensions of female connectors for tab size in inches are shown in Table D.5.

Compliance is checked by inspection and measurement.

6.5 Male tabs and female connectors shall be so designed and constructed as to allow the correct insertion and withdrawal of either the female connector or the tab without damage or loosening of other components.

Compliance is checked by the insertion and withdrawal force test of 8.1.

6.6 Male tabs and female connectors integral with equipment or components shall be securely retained.

Compliance is checked by the mechanical overload force test of 8.2.

6.7 Male tabs and female connectors shall be so designed and constructed that the temperature rise in normal use does not reach values likely to impair their further use.

Compliance is checked by the temperature rise test of 8.3.