

Connecting devices for low-voltage circuits for household and similar purposes —

Part 1: General requirements

The European Standard EN 60998-1:2004 has the status of a
British Standard

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National foreword

This British Standard is the official English language version of EN 60998-1:2004. It was derived by CENELEC from IEC 60998-1:2002. It supersedes BS EN 60998-1:1993 which will be withdrawn on 1 April 2006.

The CENELEC common modifications have been implemented at the appropriate places in the text and are indicated by tags [C] <C>.

The UK participation in its preparation was entrusted by Technical Committee PEL/23, Electrical accessories, to Subcommittee PEL/23/2, Connecting devices, which has the responsibility to:

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- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
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**Connecting devices for low-voltage circuits
for household and similar purposes
Part 1: General requirements
(IEC 60998-1:2002, modified)**

Dispositifs de connexion
pour circuits basse tension
pour usage domestique et analogue
Partie 1: Règles générales
(CEI 60998-1:2002, modifiée)

Verbindungsmaterial
für Niederspannungs-Stromkreise
für Haushalt und ähnliche Zwecke
Teil 1: Allgemeine Anforderungen
(IEC 60998-1:2002, modifiziert)

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Foreword

The text of the International Standard IEC 60998-1:2002, prepared by SC 23F, Connecting devices, of IEC TC 23, Electrical accessories, together with common modifications prepared by the CENELEC Reporting Secretariat SR 23F, was submitted to the formal vote and was approved by CENELEC as EN 60998-1 on 2004-03-01.

This European Standard supersedes EN 60998-1:1993 + A1:2001.

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) 2005-03-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2007-03-01

In this standard, the following print types are used:

- requirements proper: in roman type;
- *test specifications: in italic type;*
- explanatory matter: in smaller roman type.

Annexes ZA and ZB have been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60998-1:2002 was approved by CENELEC as a European Standard with agreed common modifications.

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CONNECTING DEVICES FOR LOW-VOLTAGE CIRCUITS FOR HOUSEHOLD AND SIMILAR PURPOSES –

Part 1: General requirements

1 Scope

This part of IEC 60998 applies to connecting devices as separate entities for the connection of two or more electrical copper conductors (complying with IEC 60228 or IEC 60344) rigid (solid or stranded) or flexible, having a cross-sectional area of 0,2 mm² up to and including 35 mm² ~~text deleted~~ with a rated voltage not exceeding 1 000 V a.c. up to and including 1 000 Hz and 1 500 V d.c. where electrical energy is used for household and similar purposes.

NOTE Rated connecting capacities lower than 0,5 mm² are referred to IEC 60344 and rated connecting capacities equal to, or higher than, 0,5 mm² are referred to IEC 60228.

Connecting devices that require the use of special tools other than for twist-on connecting devices and insulation piercing connecting devices do not comply with this standard.

This standard contains the general requirements to be used together with the relevant Part 2, containing detailed particular requirements for

- devices with screw-type clamping units (IEC 60998-2-1);
- devices with screwless-type clamping units (IEC 60998-2-2);
- devices with insulation piercing clamping units (IEC 60998-2-3);
- devices with twist-on connecting devices (IEC 60998-2-4);
- devices with connecting boxes (junction and/or tapping) (IEC 60998-2-5).

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 60068-2-32:1975, *Basic environmental testing procedures – Part 2: Tests – Test Ed: Free fall*

IEC 60068-2-75:1997, *Environmental testing – Part 2: Tests – Test Eh: Hammer tests*

IEC 60112:1979, *Method for determining the comparative and the proof tracking indices of solid insulating materials under moist conditions*

IEC 60228:1978, *Conductors of insulated cables*
Amendment 1 (1993)

IEC 60344:1980, *Guide to the calculation of resistance of plain and coated copper conductors of low-frequency cables and wires*

IEC 60529:1989, *Degrees of protection provided by enclosures (IP Code)*

IEC 60695-2-10:2000, *Fire hazard testing – Part 2-10: Glowing/hot-wire based test methods – Glow-wire apparatus and common test procedure*

IEC 60695-10-2:1995, *Fire hazard testing – Part 10: Guidance and test methods for the minimization of the effects of abnormal heat on electrotechnical products involved in fires – Section 2: Method for testing products made from non-metallic materials for resistance to heat using the ball pressure test – Basic safety publication*

IEC 61032:1997, *Protection of persons and equipment by enclosures – Probes for verification*

ISO 1456:1988, *Metallic coatings – Electrodeposited coatings of nickel plus chromium and of copper plus nickel plus chromium*

ISO 2081:1986, *Metallic coatings – Electroplated coatings of zinc on iron or steel*

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

3 Terms and definitions

For the purpose of this standard, the following definitions apply.

3.1 connection

electrical connection between two or more conductors or between a conducting part and one or more conductors

3.2 junction

connection between two or more conductor ends

3.3 tapping

connection of a conductor end (called “tapped conductor”) on any point of another conductor (called “main conductor”)

3.4 connecting device

device for the electrical connection of two or more conductors comprising one or more terminals and, if necessary, insulation and/or ancillary parts (see Annex A)

3.5 terminal

conductive part of one pole composed of one or more clamping unit(s) and insulation if necessary (see Annex A)

3.6 clamping unit

part(s) of a terminal necessary for the mechanical clamping and the electrical connection of the conductor(s), including the parts which are necessary to ensure correct contact pressure (see Annex A)

3.7**ancillary part**

part of a connecting device providing electrical and mechanical protection and/or mounting, for example, a base, an enclosure, a mounting rail, etc. (see Annex A)

3.8**rated connecting capacity**

cross-sectional area of the largest rigid conductor(s) to be connected as stated by the manufacturer of the connecting device. In the case of a connecting device for flexible conductors only, the rated connecting capacity is the cross-sectional area of the largest flexible conductor to be connected

3.9**rated insulation voltage**

voltage of a component, device or piece of equipment to which dielectric voltage tests and creepage distances are referred

3.10**rated current**

current assigned to the device by the manufacturer

3.11**clearance**

shortest distance in air between two conductive parts

3.12**creepage distance**

shortest distance along the surface of an insulating material between two conductive parts

3.13**ambient temperature**

temperature of the air surrounding the connecting device together with its enclosure, if any

3.14**temperature rise**

difference between the temperature of the part under test, together with its enclosure, if any, measured under load according to the test specification and the ambient temperature

3.15**multiway terminal device**

connecting device that consists of several terminals, insulated from each other in a common housing of insulating material, which are capable of being subdivided by the user to make connecting devices consisting of one or more terminals

3.16**unprepared conductor**

conductor which has been cut and the insulation of which has been removed over a certain length for insertion into a terminal

NOTE A conductor, the shape of which is arranged for introduction into a terminal, or of which the strands are twisted to consolidate the end, is considered to be an unprepared conductor.

4 General

Connecting devices 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 carrying out all tests specified.

5 General notes on tests

5.1 *Tests according to this standard are type tests.*

5.2 *Unless otherwise specified, the samples are tested as delivered and installed as in normal use, at an ambient temperature of $20\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$.*

5.3 *The tests are carried out in the order of the clauses.*

5.4 Unless otherwise stated, three samples are submitted to all the tests and the requirements are satisfied if all the tests are met. If only one of the samples does not satisfy a test due to an assembly or manufacturing fault, that test and any preceding ones which may have influenced the results of the test shall be repeated and also the tests which follow shall be made in the required sequence on another full set of samples, all of which shall comply with the requirements.

NOTE The applicant may submit, together with the number of samples specified in 5.4, the additional set of samples which may be wanted, should one sample fail. The testing station will then, without further request, test additional samples and will reject only if a further failure occurs. If the additional set of samples is not submitted at the same time, the failure of one sample will entail rejection.

6 Main characteristics

6.1 The preferred values of the rated insulation voltage of the connecting device are 125 V, 250 V, 300 V, 400 V, 500 V, 600 V, 690 V, 800 V, 1 000 V a.c. and d.c., and 1 500 V d.c.

6.2 The standard rated connecting capacities are 0,2 mm², 0,34 mm², 0,5 mm², 0,75 mm², 1 mm², 1,5 mm², 2,5 mm², 4 mm², 6 mm², 10 mm², 16 mm², 25 mm² and 35 mm².

 text deleted. 

NOTE 2 In the United Kingdom, 1,25 mm² is a standard rated connecting capacity.

6.3 Ambient temperatures above 40 °C require *T* marking.

The preferred values are 55 °C, 85 °C, 110 °C, 140 °C and 200 °C. If other values are used, they shall be multiples of 5 °C.