
**Povezovalne naprave v nizkonapetostnih tokokrogih za uporabo v
gospodinjstvu in podobne namene – 2-4. del: Posebne zahteve za ovijalne
povezovalne naprave (IEC 60998-2-4:2004, spremenjen)**

(istoveten EN 60998-2-4:2005)

Connecting devices for low voltage circuits for household and similar purposes –
Part 2-4: Particular requirements for twist-on connecting devices (IEC 60998-2-
4:2004, modified)

(standards.iteh.ai)

SIST EN 60998-2-4:2006

[https://standards.iteh.ai/catalog/standards/sist/577fe7a0-20be-49c6-aa4e-
4c4a03316502/sist-en-60998-2-4-2006](https://standards.iteh.ai/catalog/standards/sist/577fe7a0-20be-49c6-aa4e-4c4a03316502/sist-en-60998-2-4-2006)

iTeh STANDARD PREVIEW **(standards.iteh.ai)**

SIST EN 60998-2-4:2006

<https://standards.iteh.ai/catalog/standards/sist/577fe7a0-20be-49c6-aa4e-4c4a03316502/sist-en-60998-2-4-2006>

English version

**Connecting devices for low voltage circuits
for household and similar purposes
Part 2-4: Particular requirements for twist-on connecting devices
(IEC 60998-2-4:2004, modified)**

Dispositifs de connexion pour circuits
basse tension pour usage domestique
et analogue
Partie 2-4: Règles particulières pour
dispositifs de connexion par épissure
(CEI 60998-2-4:2004, modifiée)

Verbindungsmaterial für
Niederspannungs-Stromkreise für
Haushalt und ähnliche Zwecke
Teil 2-4: Besondere Anforderungen an
Drehklemmen
(IEC 60998-2-4:2004, modifiziert)

STANDARD PREVIEW
(standards.iteh.ai)

This European Standard was approved by CENELEC on 2005-03-01. 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.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of the International Standard IEC 60998-2-4:2004, 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 60998-2-4 on 2005-03-01.

This European Standard supersedes EN 60998-2-4:1993.

It introduces an additional explanation for the temperature cycling test.

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) 2006-03-01
- latest date by which the national standards conflicting with
the EN have to be withdrawn (dow) 2008-03-01

This Part 2-4 is intended to be used in conjunction with EN 60998-1:2004.

It supplements or modifies the corresponding clauses of EN 60998-1 so as to convert it into the European Standard: *Particular requirements for twist-on connecting devices*.

Where a particular subclause of Part 1 is not mentioned in this Part 2-4, that subclause applies as far as is reasonable. Where this Part 2-4 states "addition", "modification" or "replacement", the relevant text of Part 1 is to be adapted accordingly.

In this standard

a) the following print types are used:

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

b) the following numbering system is used:

- subclauses and figures which are additional to those in Part 1 are numbered starting from 101,
- additional annexes are lettered AA, BB, etc.,
- annexes and notes which are additional to those in IEC 60998-2-4 are prefixed with the letter "Z".

Endorsement notice

The text of the International Standard IEC 60998-2-4:2004 was approved by CENELEC as a European Standard with agreed common modifications as given below.

COMMON MODIFICATIONS

1	Delete the Note. Add: NOTE Z1 See Annex ZB for special national conditions.
3.102	Delete " or AWG".
8.1	Delete the Note.
8.1 2nd dash c)	Delete " or AWG".
8.3	Delete the Note.
14.101	Delete the Note.
14.101 Table 102	Delete the Note. Add: https://standards.iteh.ai/catalog/standards/sist/577fe7a0-20be-49c6-aa4e-42b93716592/iec-60998-2-4-2006 NOTE Z1 See Annex ZB for special national conditions.
14.103 Table 104	Delete the Note. Add: NOTE Z1 See Annex ZB for special national conditions.
14.103 Note	Delete "North American".
15.102.1	Delete Note 3.
Bibliography	Add the following note for IEC 60999-1: NOTE Z1 Harmonized as EN 60999-1:2000 (not modified).

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

Annex ZA of Part 1 is applicable.

Annex ZB (normative)

Special national conditions

Special national condition: National characteristic or practice that cannot be changed even over a long period, e.g. climatic conditions, electrical earthing conditions.

NOTE If it affects harmonization, it forms part of the European Standard.

For the countries in which the relevant special national conditions apply these provisions are normative, for other countries they are informative.

Clause

Special national condition

1

United Kingdom

SIST EN 60998-2-4:2006

<https://standards.iteh.ai/catalog/standards/sist/577fe7a0-20be-49c6-aa4e-1c4a03316502/sist-en-60998-2-4-2006>

In the UK, TOCDs must also be suitable for connecting two or more unprepared flexible cables, including a flexible cable having a cross sectional area of 1,25 mm² complying with BS 6500.

14.101

Table 102

United Kingdom

In the UK, the following additional row covering 1,25 mm² applies:

1,25	6,5	260	0,4
------	-----	-----	-----

14.103

Table 104

United Kingdom

In the UK, the following additional row covering 1,25 mm² applies:

1,25	60
------	----

**NORME
INTERNATIONALE
INTERNATIONAL
STANDARD**

**CEI
IEC**

60998-2-4

Deuxième édition
Second edition
2004-09

**PUBLICATION GROUPEE DE SÉCURITÉ
GROUP SAFETY PUBLICATION**

**Dispositifs de connexion pour circuits
basse tension pour usage domestique
et analogue –**

Partie 2-4:

**Règles particulières pour
dispositifs de connexion par épissure**

**Connecting devices for low-voltage circuits
for household and similar purposes –**

Part 2-4:

**Particular requirements for
twist-on connecting devices**

© IEC 2004 Droits de reproduction réservés — Copyright - all rights reserved

Aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photo-copie et les microfilms, sans l'accord écrit de l'éditeur.

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

International Electrotechnical Commission, 3, rue de Varembé, PO Box 131, CH-1211 Geneva 20, Switzerland
Telephone: +41 22 919 02 11 Telefax: +41 22 919 03 00 E-mail: inmail@iec.ch Web: www.iec.ch



Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

CODE PRIX
PRICE CODE

T

Pour prix, voir catalogue en vigueur
For price, see current catalogue

CONTENTS

FOREWORD.....	5
1 Scope.....	11
2 Normative references	11
3 Terms and definitions	11
4 General	13
5 General notes on tests	13
6 Main characteristics.....	15
7 Classification.....	15
8 Marking	15
9 Protection against electric shock	17
10 Connection of conductors	17
11 Construction	19
12 Resistance to ageing, to humid conditions, to ingress of solid foreign objects and to harmful ingress of water	19
13 Insulation resistance and electric strength	21
14 Mechanical strength	23
15 Temperature rise	29
16 Resistance to heat.....	35
17 Clearances and creepage distances	35
18 Resistance of insulating material to abnormal heat and fire	35
19 Resistance of insulating material to tracking	35
20 EMC requirements.....	35
Annex AA (informative) Example for temperature cycling test according to 15.102.1	45
Figure 101 – Gripping dimension	37
Figure 102 – Examples of torque calculations of 14.103	39
Figure 103 – Exemple for the application of the pull-out force in the axis of TOCD.....	41
Figure 104 – Test apparatus according to 14.101	43
Figure AA.1 – Example for temperature cycling test according to 15.102.1 for TOCDs designed to accept all type of conductors	45
Table 101 – Number of new samples and sequence of the tests	13
Table 102 – Relationship between mass, height and cross-sectional area of conductors.....	25
Table 103 – Number of conductors to be removed	25
Table 104 – Relationship between pull force and cross-sectional area of conductors	29

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**CONNECTING DEVICES FOR LOW-VOLTAGE CIRCUITS
FOR HOUSEHOLD AND SIMILAR PURPOSES –****Part 2-4: Particular requirements for
twist-on connecting devices**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with an IEC Publication.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60998-2-4 has been prepared by sub-committee 23F: Connecting devices, of IEC technical committee 23: Electrical accessories.

This second edition cancels and replaces the first edition published in 1993 and constitutes a technical revision. This edition introduces an additional explanation for the temperature cycling test.

It has the status of a group safety publication in accordance with IEC Guide 104.

The text of this standard is based on the following documents:

FDIS	Report on voting
23F/162/FDIS	23F/164/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

This standard constitutes Part 2-4 of the IEC 60998 series, published under the general title *Connecting devices for low voltage circuits for household and similar purposes*. This series consists of Part 1, devoted to general requirements, and various parts 2, devoted to particular requirements.

At the moment of the publication of this part, the following parts had already been published.

- Part 1: General requirements
- Part 2-1: Particular requirements for connecting devices as separate entities with screw-type clamping units
- Part 2-2: Particular requirements for connecting devices as separate entities with screwless-type clamping units
- Part 2-3: Particular requirements for connecting devices as separate entities with insulation piercing clamping units
- Part 2-4: Particular requirements for twist-on connecting devices
- Part 2-5: Particular requirements for connecting boxes (junction and/or tapping) for terminals or connecting devices

This Part 2-4 is intended to be used in conjunction with IEC 60998-1. It was established on the basis of the second edition (2002) of that standard.

It supplements or modifies the corresponding clauses in IEC 60998-1 so as to convert that publication into the IEC standard: *Particular requirements for twist-on connecting devices*.

Where a particular subclause of Part 1 is not mentioned in this Part 2-4, that subclause applies as far as is reasonable. Where this standard states "addition", "modification" or "replacement", the relevant requirements, test specification or explanatory matter in Part 1 should be adapted accordingly.

In this standard:

- a) the following print types are used:
 - requirements proper: in roman type;
 - *test specifications: in italic type;*
 - explanatory matter: in smaller roman type.
- b) subclauses and figures which are additional to those in Part 1 are numbered starting from 101; additional annexes are lettered AA, BB, etc.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

iTeh STANDARD PREVIEW **(standards.iteh.ai)**

SIST EN 60998-2-4:2006

<https://standards.iteh.ai/catalog/standards/sist/577fe7a0-20be-49c6-aa4e-4c4a03316502/sist-en-60998-2-4-2006>

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

Part 2-4: Particular requirements for twist-on connecting devices

1 Scope

Replacement:

This International Standard applies to twist-on connecting devices for connecting two or more unprepared rigid and/or flexible copper conductors having a cross-sectional area of 0,5 mm² up to and including 16 mm² and complying with IEC 60228, the total cross-sectional area of the connected conductors not exceeding 35 mm².

It covers low voltage circuits up to 1 000 V a.c. and 1 500 V d.c. where electrical energy is utilized for household and similar purposes.

This standard covers TOCDs primarily designed for application by hand. However, certain TOCDs, for example for large cross-sections, may require the use of a tool designed for that particular TOCD.

NOTE In the UK, TOCDs must also be suitable for connecting 2 or more unprepared flexible cables, including a flexible cable having a cross sectional area of 1,25 mm² complying with BS 6500. Wires and cables in the USA do not presently comply to IEC 60228.

[SIST EN 60998-2-4:2006](https://standards.iteh.ai/catalog/standards/sist/577fe7a0-20be-49c6-aa4e-4c4a03316502/sist-en-60998-2-4-2006)

2 Normative references

<https://standards.iteh.ai/catalog/standards/sist/577fe7a0-20be-49c6-aa4e-4c4a03316502/sist-en-60998-2-4-2006>

This clause of Part 1 is applicable.

3 Terms and definitions

This clause of Part 1 is applicable, except as follows:

Additional definitions:

3.101

twist-on connecting device

TOCD

terminal which is twisted on the ends of two or more conductors

3.102

range of TOCD's connecting capacity

the smallest and the largest individual conductors (expressed in mm² or AWG) used in pairs of equal size capable of being safely connected as specified by the manufacturer. This does not exclude the use of more than two conductors in the TOCD or the use of conductors of sizes outside the specified range of connecting capacity.