



**Kopplingsmateriel –
Anslutningsklämmor av skruvtyp och av skruvlös typ
för anslutning av kopparledare –
Säkerhetsfordringar –
Del 1: Allmänna fordringar på klämmor för ledare
med area 0,2 mm² t o m 35 mm²**

Connecting devices –

Electrical copper conductors –

Safety requirements for screw-type and screwless-type clamping units –

*Part 1: General requirements and particular requirements for clamping units for conductors
from 0,2 mm² up to 35 mm² (included)*

Som svensk standard gäller europastandarden EN 60999-1:2000. Den svenska standarden innehåller den officiella engelska språkversionen av EN 60999-1:2000.

Nationellt förord

Europastandarden EN 60999-1:2000

består av:

- **europastandardens ikraftsättningsdokument**, utarbetat inom CENELEC
- **IEC 60999-1, Second edition, 1999 - Connecting devices -Electrical copper conductors - Safety requirements for screw-type and screwless-type clamping units - Part 1: General requirements and particular requirements for clamping units for conductors from 0,2 mm² up to 35 mm² (included)**

utarbetad inom International Electrotechnical Commission, IEC.

Tidigare utgiven svensk standard SS-EN 60999-1, utgåva 1, 1994, gäller ej fr o m 2003-01-01.

English version

Connecting devices - Electrical copper conductors
Safety requirements for screw-type and screwless-type clamping units
Part 1: General requirements and particular requirements for clamping
units for conductors from 0,2 mm² up to 35 mm² (included)
(IEC 60999-1:1999)

Dispositifs de connexion - Conducteurs électriques en cuivre - Prescriptions de sécurité pour organes de serrage à vis et sans vis

Partie 1: Prescriptions générales et particulières pour les organes de serrage pour les conducteurs de 0,2 mm² à 35 mm² (inclus)
(CEI 60999-1:1999)

Verbindungsmaterial - Elektrische Kupferleiter - Sicherheitsanforderungen für schraub- und schraubenlose Klemmstellen

Teil 1: Allgemeine Anforderungen und besondere Anforderungen für Klemmstellen für Leiter von 0,2 mm² bis einschließlich 35 mm²
(IEC 60999-1:1999)

This European Standard was approved by CENELEC on 2000-01-01. 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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, 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 document 23F/108/FDIS, future edition 2 of IEC 60999-1, prepared by SC 23F, Connecting devices, of IEC TC 23, Electrical accessories, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60999-1 on 2000-01-01.

This European Standard supersedes EN 60999-1:1993 and its corrigendum March 1997.

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) 2000-10-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2003-01-01

Annexes designated "normative" are part of the body of the standard.

Annexes designated "informative" are given for information only.

In this standard, annexes B, C and ZA are normative and annex A is informative.

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60999-1:1999 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60998-2-3 NOTE: Harmonized as EN 60998-2-3:1993 (not modified).

IEC 60998-2-4 NOTE: Harmonized as EN 60998-2-4:1993 (not modified).

IEC 61210 NOTE: Harmonized as EN 61210:1995 (modified).

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

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 60228 (mod) + IEC 60228A (mod)	1978 1982	Conductors of insulated cables First supplement: Guide to the dimensional limits of circular conductors	HD 383 S2	1986
IEC 60344	1980	Guide to the calculation of resistance of plain and coated copper conductors of low-frequency cables and wires	-	-
IEC 61545	1996	Connecting devices - Devices for the connection of aluminium conductors in clamping units of any material and copper conductors in aluminium bodied clamping units	-	-
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	-	-

CONTENTS

Clause	Page
1 Scope	4
2 Normative references.....	4
3 Definitions.....	5
4 General.....	7
5 General notes on tests	7
6 Main characteristics	7
7 Connection of conductors	8
8 Constructional requirements	9
9 Tests.....	13
Annex A (informative) Approximate relationship between mm ² and AWG sizes	24
Annex B (normative) Rated connecting capacity and corresponding gauges	25
Annex C (normative) Construction of stranded conductors	26
Bibliography	27
Figure 1 – Test apparatus according to 9.4	19
Figure 2 – Examples of pillar clamping units.....	20
Figure 3 – Examples of screw and stud clamping units	21
Figure 4 – Examples of <i>saddle</i> clamping units	22
Figure 5 – Examples of mantle clamping units	22
Figure 6 – Examples of screwless-type clamping units	23
Table 1 – Relationship between rated connecting capacity and diameter of conductors.....	8
Table 2 – Relationship between mass and cross-sectional area during testing	15
Table 3 – Relationship between pull force and cross-sectional area.....	15
Table 4 – Relationship between torque and nominal diameter of thread	16

**CONNECTING DEVICES –
ELECTRICAL COPPER CONDUCTORS –
SAFETY REQUIREMENTS FOR SCREW-TYPE AND
SCREWLESS-TYPE CLAMPING UNITS –**

**Part 1: General requirements and particular requirements for clamping
units for conductors from 0,2 mm² up to 35 mm² (included)**

1 Scope

This part of IEC 60999 applies to screw-type and screwless-type clamping units for connecting devices, either as separate entities or as integral parts of equipment, for the connection of electrical copper conductors (complying with IEC 60228), rigid (solid or stranded) and/or flexible, having a cross-sectional area of 0,2 mm² up to and including 35 mm² and equivalent AWG sizes with a rated voltage not exceeding 1 000 V a.c. with a frequency up to and including 1 000 Hz, and 1 500 V d.c.

It applies to clamping units primarily suitable for connecting unprepared conductors.

This standard does not apply to clamping units

- a) for connection by crimping or soldering;
- b) for data and signalling circuits;
- c) for flat quick-connect terminations, insulation-piercing connecting devices and twist-on connecting devices, which are covered by IEC 61210 [3]¹⁾, IEC 60998-2-3 [1] and IEC 60998-2-4 [2] respectively.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 60999. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of IEC 60999 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60228:1978, *Conductors of insulated cables*

IEC 60228A:1982, *Conductors of insulated cables – First supplement*

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

IEC 61545:1996, *Connecting devices – Devices for the connection of aluminium conductors in clamping units of any material and copper conductors in aluminium bodied clamping units*

¹⁾ Figures in square brackets refer to the bibliography.