Mõõtetrafod. Osa 1: Voolutrafod

Instrument transformers - Part 1: Current transformers

EESTI STANDARDIKESKUS
ESTONIAN CENTRE FOR STANDARDISATION

EESTI STANDARDI EESSÕNA **NATIONAL FOREWORD**

Käesolev Eesti standard EVS-EN 60044-1:2002+A2:2003 sisaldab Euroopa standardi EN 60044-1:1999 + EN 60044-1:1999/A1:2000 + EN 60044-1:1999/A2:2003 ingliskeelset teksti.	This Estonian standard EVS-EN 60044-1:2002+A2:2003 consists of the English text of the European standard EN 60044-1:1999 + EN 60044-1:1999/A1:2000 + EN 60044-1:1999/A2:2003.
Standard on kinnitatud Eesti Standardikeskuse 25.11.2010 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.	This standard is ratified with the order of Estonian Centre for Standardisation dated 25.11.2010 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.
Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 20.08.1999.	Date of Availability of the European standard text 20.08.1999.
Standard on kättesaadav Eesti standardiorganisatsioonist.	The standard is available from Estonian standardisation organisation.

ICS 17.220.20

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60044-1

August 1999

ICS 17.220.20

Supersedes HD 553 S2:1993

English version

Instrument transformers
Part 1: Current transformers
(IEC 60044-1:1996, modified)

Transformateurs de mesure
Partie 1: Transformateurs de courant
(CEI 60044-1:1996, modifiée)

Meßwandler
Teil 1: Stromwandler
(IEC 60044-1:1996, modifiziert)

This European Standard was approved by CENELEC on 1999-08-01. 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

Ref. No. EN 60044-1:1999 E

Foreword

The text of the International Standard IEC 60044-1:1996, prepared by IEC TC 38, Instrument transformers, together with common modifications prepared by the Technical Committee CENELEC TC 38X, Instrument transformers, was submitted to the formal vote and was approved by CENELEC as EN 60044-1 on 1999-08-01.

This European Standard supersedes HD 553 S2:1993.

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) 2000-08-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2002-01-01

Annexes designated "normative" are part of the body of the standard.
Annexes designated "informative" are given for information only.
In this standard, annexes A and ZA are normative and annex B is informative.
Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60044-1:1996 was approved by CENELEC as a European Standard with agreed common modifications as given below.

COMMON MODIFICATIONS

1.1 **Add** at the end of the scope:

Instrument transformers (ITs) are considered to be passive elements.

NOTE: For outdoor ITs having voltages ≥ 123 kV the RIV measurements are suitable to cover the requirements of EMC Directive. For guidance of the test procedure EN 60694:1996, § 6.3 might be followed.

2.1.27 **Add** at the end of the subclause:

Rated times other than one second, such as 0,5 s, 2 s and 3 s may be agreed.

4.5.1 **Replace** "(see 2.1.25)" by "(see 2.1.27)".

4.5.2 **Replace** "(see 2.1.26)" by "(see 2.1.28)".

Table 4 **Replace** the 3rd row of values by the following:

420	**950**	1300
	1050	1425

(The remaining part of the table shall remain as it is).

10.1.2 **Replace** the sentence before Table 10 by the following:

The preferred terminal markings of current transformers are given in the following table 10.

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.

Publication	Year	Title	EN/HD	Year
IEC 60028	1925	International standard of resistance for copper	-	-
IEC 60038 (mod)	1983	IEC standard voltages[1)]	HD 472 S1	1989
IEC 60050-321	1986	International electrotechnical vocabulary Chapter 321: Instrument transformers	-	-
IEC 60060-1 + corr. March	1989 1990	High-voltage test techniques Part 1: General definitions and test requirements	HD 588.1 S1	1991
IEC 60071-1	1993	Insulation co-ordination Part 1: Definitions, principles and rules	EN 60071-1	1995
IEC 60085	1984	Thermal evaluation and classification of electrical insulation	HD 566 S1	1990
IEC 60121	1960	Recommendation for commercial annealed aluminium electrical conductor wire	-	-
IEC 60270	1981	Partial discharge measurements	-	-
IEC 60567	1992	Guide for the sampling of gases and of oil from oil-filled electrical equipment and for the analysis of free and dissolved gases	EN 60567	1992
IEC 60599	1978	Interpretation of the analysis of gases in transformers and other oil-filled electrical equipment in service	HD 397 S1[2)]	1979
IEC 60721	series	Classification of environmental conditions	EN 60721 HD 478.2	series series

1) The title of HD 472 S1 is: *Nominal voltages for low voltage public electricity supply systems.*

2) HD 397 S2 is superseded by EN 60599:1999, which is based on IEC 60599:1999.

Publication	Year	Title	EN/HD	Year
IEC 60815	1986	Guide for the selection of insulators in respect of polluted conditions	-	-

EUROPEAN STANDARD **EN 60044-1/A2**

NORME EUROPÉENNE

EUROPÄISCHE NORM January 2003

ICS 17.220.20; 29.180

English version

Instrument transformers
Part 1: Current transformers
(IEC 60044-1:1996/A2:2002)

Transformateurs de mesure
Partie 1: Transformateurs de courant
(CEI 60044-1:1996/A2:2002)

Messwandler
Teil 1: Stromwandler
(IEC 60044-1:1996/A2:2002)

This amendment A2 modifies the European Standard EN 60044-1:1999; it was approved by CENELEC on 2002-12-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment 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 amendment 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, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, 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

Ref. No. EN 60044-1:1999/A2:2003 E

Foreword

The text of document 38/285/FDIS, future amendment 2 to IEC 60044-1:1996, prepared by IEC TC 38, Instrument transformers, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as amendment A2 to EN 60044-1:1999 on 2002-12-01.

The following dates were fixed:

- latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2003-09-01
- latest date by which the national standards conflicting with the amendment have to be withdrawn (dow) 2005-12-01

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Endorsement notice

The text of amendment 2:2002 to the International Standard IEC 60044-1:1996 was approved by CENELEC as an amendment to the European Standard without any modification.

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IEC 60044-1

Edition 1.2 2003-02

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Instrument transformers – Part 1: Current transformers

Transformateurs de mesure – Partie 1: Transformateurs de courant

IEC 60044-1:1996+A1:2000+A2:2002

IEC Central Office
3, rue de Varembé
CH-1211 Geneva 20
Switzerland
Email: inmail@iec.ch
Web: www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

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A propos de la CEI

La Commission Electrotechnique Internationale (CEI) est la première organisation mondiale qui élabore et publie des normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications CEI

Le contenu technique des publications de la CEI est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

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Email: csc@iec.ch
Tél.: +41 22 919 02 11
Fax: +41 22 919 03 00

IEC 60044-1

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

Instrument transformers – Part 1: Current transformers

Transformateurs de mesure – Partie 1: Transformateurs de courant

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

INSTRUMENT TRANSFORMERS –

Part 1: Current transformers

FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The 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 the 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 National Committees.
3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60044-1 has been prepared by IEC technical committee 38: Instrument transformers.

This consolidated version of IEC 60044-1 consists of the first edition (1996) [documents [documents 38/161/FDIS and 38/174/RVD, its amendment 1 (2000) [documents 38/245/FDIS and 38/257/RVD] and its amendment 2 (2002) [documents 38/285/FDIS and 38/289/RVD].

The technical content is therefore identical to the base edition and its amendments and has been prepared for user convenience.

It bears the edition number 1.2.

A vertical line in the margin shows where the base publication has been modified by amendments 1 and 2.

Annex A forms an integral part of this standard.

Annex B is for information only.

The committee has decided that the contents of the base publication and its amendments will remain unchanged until 2005-12. At this date, the publication will be

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

INSTRUMENT TRANSFORMERS –

Part 1: Current transformers

1 General

1.1 Scope

This part of IEC 60044 applies to newly manufactured current transformers for use with electrical measuring instruments and electrical protective devices at frequencies from 15 Hz to 100 Hz.

Although the requirements relate basically to transformers with separate windings, they are also applicable, where appropriate, to autotransformers.

Clause 11 covers the requirements and tests, in addition to those in clauses 3 to 10, that are necessary for current transformers for use with electrical measuring instruments.

Clause 12 covers the requirements and tests, in addition to those in clauses 3 to 10, that are necessary for current transformers for use with electrical protective relays, and in particular for forms of protection in which the prime requirement is the maintenance of accuracy up to several times the rated current.

For certain protective systems, where the current transformer characteristics are dependant on the overall design of the protective equipment (for example high-speed balanced systems and earth-fault protection in resonant earthed networks), additional requirements are given in clause 13 for class PR transformers and in clause 14 for class PX transformers.

Clause 13 covers the requirements and tests in addition to those in clauses 3 to 10 that are necessary for current transformers for use with electrical protective relays, and in particular for forms of protection in which the prime requirement is the absence of remanent flux.

Clause 14 covers the requirements and tests in addition to those in clauses 3 to 10 that are necessary for current transformers for use with electrical protective relays, and in particular for forms of protection for which knowledge of the transformer's secondary excitation characteristic, secondary winding resistance, secondary burden resistance and turns ratio is sufficient to assess its performance in relation to the protective relay system with which it is to be used.

Current transformers intended for both measurement and protection shall comply with all the clauses of this standard.

1.2 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 60028:1925, *International standard of resistance for copper*

IEC 60038:1983, *IEC standard voltages*

IEC 60044-6:1992, *Instrument transformers – Part 6: Requirements for protective current transformers for transient performance*

IEC 60050(321):1986, *International Electrotechnical Vocabulary – Chapter 321: Instrument transformers*

IEC 60060-1:1989, *High-voltage test techniques – Part 1: General definitions and test requirements*

IEC 60071-1:1993, *Insulation co-ordination – Part 1: Definitions, principles and rules*

IEC 60085:1984, *Thermal evaluation and classification of electrical insulation*

IEC 60121:1960, *Recommendation for commercial annealed aluminium electrical conductor wire*

IEC 60270:1981, *Partial discharge measurements*

IEC 60567:1992, *Guide for the sampling of gases and of oil from oil-filled electrical equipment and for the analysis of free and dissolved gases*

IEC 60599:1978, *Interpretation of the analysis of gases in transformers and other oil-filled electrical equipment in service*

IEC 60721: *Classification of environmental conditions*

IEC 60815:1986, *Guide for the selection of insulators in respect of polluted conditions*

CISPR 18-2:1986, *Radio interference characteristics of overhead power lines and high-voltage equipment – Part 2: Methods of measurement and procedure for determining limits*

2 Definitions

For the purpose of this part of IEC 60044, the following definitions apply:

2.1 General definitions

2.1.1
instrument transformer
a transformer intended to supply measuring instruments, meters, relays and other similar apparatus

[IEV 321-01-01 modified]

2.1.2
current transformer
an instrument transformer in which the secondary current, in normal conditions of use, is substantially proportional to the primary current and differs in phase from it by an angle which is approximately zero for an appropriate direction of the connections

[IEV 321-02-01]

2.1.3
primary winding
the winding through which flows the current to be transformed

2.1.4
secondary winding
the winding which supplies the current circuits of measuring instruments, meters, relays or similar apparatus