SLOVENSKI STANDARD
SIST EN 61036:1998

01-april-1998

Nadomešča:
SIST EN 61036:1997

Alternating current watt-hour meters for active energy (classes 1 and 2) (IEC 61036:1996)

Alternating current static watt-hour meters for active energy (classes 1 and 2)

Elektronische Wechselstrom-Wirkverbrauchszähler (Genauigkeitsklassen 1 und 2)

Compteurs statiques d'énergie active pour courant alternatif (classes 1 et 2)

Ta slovenski standard je istoveten z: EN 61036:1996

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Alternating current static watt-hour meters for active energy (classes 1 and 2) (IEC 1036:1996)

Compteurs statiques d'énergie active pour courant alternatif (classes 1 et 2) (CEI 1036:1996)

Elektronische Wechselstrom-Wirkverbrauchszähler (Genauigkeitsklassen 1 und 2) (IEC 1036:1996)

This European Standard was approved by CENELEC on 1996-07-02. 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, 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

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Foreword

The text of document 13/1099/FDIS, future edition 2 of IEC 1036, prepared by the Technical Committee CENELEC TC 13, Equipment for electrical energy measurement and load control was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61036 on 1996-07-02.

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) 1997-06-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 1997-06-01

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

Endorsement notice

The text of the International Standard IEC 1036:1996 was approved by CENELEC as a European Standard without any modification.

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 38 (mod)	1983	IEC standard voltages[1]	HD 472 S1	1989
IEC 50(301)	1983	International Electrotechnical Vocabulary (IEV) Chapter 301: General terms on measurements in electricity	-	-
IEC 50(302)	1983	Chapter 302: Electrical measuring instruments	-	-
IEC 50(303)	1983	Chapter 303: Electronic measuring instruments	-	-
IEC 60	series	High-voltage test techniques	HD 588.1 S1 EN 60060-2	1991 1994
IEC 68-2-1	1990	Environmental testing Part 2: Tests - Tests A: Cold	EN 60068-2-1	1993
IEC 68-2-2	1974	Part 2: Tests - Test B: Dry heat	EN 60068-2-2[2]	1993
IEC 68-2-5	1975	Part 2: Tests - Test Sa: Simulated solar radiation at ground level	HD 323.2.5 S1	1988
IEC 68-2-6	1982	Part 2: Tests - Test Fc and guidance : Vibration (Sinusoidal)	HD 323.2.6 S2[3]	1988
IEC 68-2-11	1981	Part 2: Tests - Test Ka: Salt mist	HD 323.2.11 S1	1988
IEC 68-2-27	1987	Part 2: Tests - Test Ea and guidance: Shock	EN 60068-2-27	1993

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

2) EN 60068-2-2 includes supplement A:1976 to IEC 68-2-2.

3) HD 323.2.6 S2 is superseded by EN 60068-2-6:1995, which is based on IEC 68-2-6:1995.

Publication	Year	Title	EN/HD	Year
IEC 68-2-30	1980	Part 2: Tests - Test Db and guidance: Damp heat, cyclic (12 + 12 hour cycle)	HD 323.2.30 S3[4]	1988
IEC 85	1984	Thermal evaluation and classification of electrical insulation	HD 566 S1	1990
IEC 185 (mod)	1987	Current transformers	HD 553 S2[5]	1993
IEC 186 (mod)	1987	Voltage transformers	HD 554 S1[6]	1992
IEC 269-1	1986	Low-voltage fuses Part 1: General requirements	EN 60269-1	1989
IEC 359	1987	Expression of the performance of electrical and electronic measuring equipment	-	-
IEC 387	1992	Symbols for alternating-current electricity meters	EN 60387	1992
IEC 417C	1977	Graphical symbols for use on equipment Index, survey and compilation of the single sheets	HD 243 S12[7]	1995
IEC 514 (mod)	1975	Acceptance inspection of Class 2 alternating-current watthour meters	EN 60514	1995
IEC 521	1988	Class 0,5, 1 and 2 alternating-current watthour meters	EN 60521	1995
IEC 529	1989	Degrees of protection provided by enclosures (IP Code)	EN 60529 + corr. May	1991 1993
IEC 687	1992	Alternating-current static watt-hour meters for active energy (Classes 0,2 S and 0,5 S)	EN 60687 + corr. March	1992 1993
IEC 695-2-1/X[8]	1994	Fire hazard testing Part 2: Test methods Section 1	-	-
IEC 721-3-3	1994	Classification of environmental conditions Part 3: Classification of groups of environmental parameters and their severities Section 3: Stationary use at weatherprotected locations	EN 60721-3-3	1995

4) HD 323.2.30 S3 includes A1:1985 to IEC 68-2-30.

5) HD 553 S2 includes A1:1990 to IEC 185.

6) HD 554 S1 includes A1:1988 to IEC 186.

7) HD 243 S12 is based on IEC 417:1973 and its supplements A:1974 to M:1994.

8) IEC 695-2-1/0 to 1/3:1994 are being harmonized by CENELEC.

Publication	Year	Title	EN/HD	Year
IEC 736	1982	Testing equipment for electrical energy meters	-	-
IEC 1000-4-2	1995	Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques Section 2: Electrostatic discharge immunity test - Basic EMC publication	EN 61000-4-2	1995
IEC 1000-4-3 (mod)	1995	Section 3: Radiated, radio-frequency, electromagnetic field immunity test	EN 61000-4-3	1996
IEC 1000-4-4	1995	Section 4: Electrical fast transient/burst immunity test - Basic EMC publication	EN 61000-4-4	1995
CISPR 22	1993	Limits and methods of measurement of radio disturbance characteristics of information technology equipment	EN 55022	1994
ISO 75-2	1993	Plastics - Determination of temperature of deflection under load Part 2: Plastic and ebonite	-	-

NORME INTERNATIONALE

INTERNATIONAL STANDARD

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Deuxième édition
Second edition
1996-09

Compteurs statiques d'énergie active pour courant alternatif (classes 1 et 2)

Alternating current static watt-hour meters for active energy (classes 1 and 2)

Bureau central de la Commission Electrotechnique Internationale 3, rue de Varembé Genève, Suisse

Commission Electrotechnique Internationale
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For price, see current catalogue

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ALTERNATING CURRENT STATIC WATT-HOUR METERS FOR ACTIVE ENERGY (CLASSES 1 AND 2)

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 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. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 1036 has been prepared by IEC technical committee 13: Equipment for electrical energy measurement and load control.

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

FDIS	Report on voting
13/1099/FDIS	13/1118/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 second edition cancels and replaces the first edition published in 1990.

Annexes A, B, C, D, E and F form an integral part of this standard.

INTRODUCTION

This International Standard has been prepared using IEC 521 and IEC 687 as reference standards. As many new requirements and tests had to be added, this new standard has been split into five clauses, namely:

1 Scope
2 Normative references
3 Definitions
4 Requirements
5 Tests and test conditions

For all tests which are not specified in this standard, reference must be made to existing IEC Publications.

This standard is a type test standard, in line with IEC 521 and 687. It covers the "standard meter", which will be used indoors and outdoors in big quantities world-wide. It does not deal with special executions (such as metering-part and display in separate housings). These will be covered in separate International Standards.

This standard distinguishes:

– between accuracy class index 1 and accuracy class index 2 meters;
– between protective class I and protective class II meters;
– between meters for use in networks equipped with or without earth fault neutralizers.

The test levels are regarded as minimum values to guarantee the proper functioning of the meter under normal working conditions. For special application, other test levels might be necessary and will be fixed between the user and the manufacturer.

The static meter will face the same general environmental conditions as the electromechanical meter. Therefore, the specification will implement all the requirements fixed in IEC 521 wherever necessary, in particular the mechanical requirements.

Regarding accuracy requirements and the errors due to other influence quantities, it is expected that the electronic solutions will show a much better performance. The application of the same error limits as used in IEC 521 makes more economical and more reliable products possible and does not require new definitions for class 1 and class 2 meters. In future revisions of this standard, the practical experience should be taken into account.

Regarding the influence of harmonics, special test procedures had to be incorporated. These tests check the functionality of the meter when the meter is exposed to large distortions in the current circuit and the accuracy of the meter with 5th harmonic in the current and voltage circuit.

To check the functionality, three practical conditions have been specified:

- half-wave rectification (d.c. and even harmonics);
- phase-fired control (odd harmonics);
- burst control (sub-harmonics).

To check if the meters accurately measure total energy in the presence of harmonics a test with 5^{th} harmonic in both the current and voltage circuits has been specified. It is assumed that correct measurement of 5^{th} harmonic energy indicates that measurement for other harmonics will be good.

The reliability aspects of equipment for electrical energy measurement and load control will be handled separately.

For tests and test conditions, existing tests and test levels have been taken from IEC 521, IEC 687 and appropriate IEC specifications. New tests had to be added with respect to EMC.

The IEC publications referred to in this standard are listed in clause 2.

ALTERNATING CURRENT STATIC WATT-HOUR METERS FOR ACTIVE ENERGY (CLASSES 1 AND 2)

1 Scope

This International Standard applies only to newly manufactured static watt-hour meters of accuracy classes 1 and 2, for the measurement of alternating current electrical active energy of a frequency in the range 45 Hz to 65 Hz and to their type tests only.

It applies only to static watt-hour meters for indoor and outdoor application consisting of a measuring element and register(s) enclosed together in a meter case. It also applies to operation indicator(s) and test output(s).

It does not apply to:

a) watt-hour meters where the voltage across the connection terminals exceeds 600 V (line-to-line voltage for meters for polyphase systems);

b) portable meters;

c) data interfaces to the register of the meter.

Where the display and/or the memory(ies) is/are external or where other elements are enclosed in the meter case (such as maximum demand indicators, telemetering, time switches or remote control, etc.) this standard applies only to the metering section.

This standard does not cover the acceptance tests and the conformity tests (both testing procedures are connected with legal requirements of the different countries and could only be taken care of partially). Regarding acceptance tests, a basic guideline is given in IEC 514.

The reliability aspect is also not covered in this standard as there are no short-term test procedures available which would fit into type test documents to satisfactorily check this requirement.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 38: 1983, *IEC standard voltages*

IEC 50(301, 302, 303): 1983, *International Electrotechnical Vocabulary (IEV) – Chapter 301: General terms on measurements in electricity – Chapter 302: Electrical measuring instruments – Chapter 303: Electronic measuring instruments*

IEC 60: *High-voltage test techniques*