SLOVENSKI STANDARD
SIST EN 61358:1997

01-april-1997

Prevzemna kontrola za statične števce električne delovne energije izmeničnega toka za direktno priključitev (razreda 1 in 2) (IEC 1358:1996)

Acceptance inspection for direct connected alternating current static watt-hour meters for active energy (classes 1 and 2)

Annahmeprüfung von elektronischen Wechselstrom-Wirkverbrauchzählern für direkten Anschluß (Klassen 1 und 2)

Contrôle de réception des compteurs statiques d'énergie active pour courant alternatif et à branchement direct (classes 1 et 2)

Ta slovenski standard je istoveten z: **EN 61358:1996**

ICS:

17.220.20	Merjenje električnih in magnetnih veličin	Measurement of electrical and magnetic quantities

SIST EN 61358:1997 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 61358

June 1996

ICS 17.220.20

Descriptors: Acceptance inspection, static meter, active energy, direct connected, alternating current

English version

Acceptance inspection for direct connected alternating current static watt-hour meters for active energy (classes 1 and 2)
(IEC 1358:1996)

Contrôle de réception des compteurs statiques d'énergie active pour courant alternatif et à branchement direct (classes 1 et 2)
(CEI 1358:1996)

Annahmeprüfung von elektronischen Wechselstrom-Wirkverbrauchzählern für direkten Anschluß (Klassen 1 und 2)
(IEC 1358:1996)

This European Standard was approved by CENELEC on 1996-03-05. 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.

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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 13/1093/FDIS, future edition 1 of IEC 1358, prepared by IEC 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 61358 on 1996-03-05.

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- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 1997-01-01

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 1358:1996 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 410	1973	Sampling plans and procedures for inspection by attributes	-	-
IEC 514 (mod)	1975	Acceptance inspection of Class 2 alternating-current watthour meters	EN 60514	1995
IEC 1036 (mod)	1990	Alternating current static watt-hour meters for active energy (Classes 1 and 2)	EN 61036 + corr. March	1992 1994
ISO 3534-1	1993	Statistics - Vocabulary and symbols Part 1: Probability and general statistical terms	-	-
ISO 3534-2	1993	Part 2: Statistical quality control	-	-

NORME INTERNATIONALE
INTERNATIONAL STANDARD

CEI
IEC
1358

Première édition
First edition
1996-04

Contrôle de réception des compteurs statiques d'énergie active pour courant alternatif et à branchement direct (classes 1 et 2)

Acceptance inspection for direct connected alternating current static watt-hour meters for active energy (classes 1 and 2)

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Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

CODE PRIX
PRICE CODE U

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

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ACCEPTANCE INSPECTION FOR DIRECT CONNECTED 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 cooperation 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.
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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 1358 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
13/1093/FDIS	13/1110/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.

Annex A forms an integral part of this standard.

Annex B is for information only.

INTRODUCTION

This International Standard describes, in some detail, methods for acceptance inspection, and testing of newly manufactured static watt-hour meters delivered in quantities of 50 and above. IEC 514 serves as a reference document and annex A of that standard should be consulted for explanatory notes concerning sampling procedures.

In this standard, wider error limits than those for type tests specified in the relevant publications have been allowed because:

- acceptance testing conditions have wider tolerances than those for type tests;
- displacing of the zero axis is not applicable for acceptance testing;
- the effects of handling of meters are taken into account.

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

1 Scope

The methods and procedures included in this International Standard apply to newly manufactured direct connected alternating current static watt-hour meters of classes 1 and 2, covered by IEC 1036, which are produced and delivered in quantities of 50 and above.

They provide for 100 % inspection or sampling inspection for acceptance by the purchaser.

2 General remarks

2.1 Two methods of acceptance inspection are proposed, namely:

- 100 % inspection, and
- sampling inspection.

2.2 The 100 % inspection consists of testing all the meters of a batch.

2.3 The sampling inspection is based upon the principles of mathematical statistics and as a consequence certain specified risks are undertaken both by the manufacturer and the purchaser. However, sampling inspection generally is more economical than 100 % inspection.

In this standard, sampling inspection has been planned so that, in practice, the quality of the meter batches can be judged with nearly the same confidence as with 100 % inspection.

2.4 Two methods of sampling inspection are described:

- inspection by attributes;
- inspection by variables.

These two methods have been chosen so that the judgement of quality is virtually the same for both methods.

2.5 Inspection by *attributes* gives results indicating conformity or non-conformity.

It *shall* be applied when the characteristics under inspection cannot be measured.

It *shall* also be applied when a characteristic can be measured but the values are not of normal distribution (Laplace-Gauss).

It *may* be applied, when the distribution is approximately normal, in place of inspection by variables.

The advantage of inspection by attributes is its simplicity of application.

2.6 Inspection by *variables* gives additional information but it is applicable only when the values of a characteristic are measurable and when those values are approximately normally distributed. In these circumstances, inspection by variables is the recommended method.

The advantage of inspection by variables is a smaller sample size than by attributes for the same risk of decision. However, it requires more calculation.

The test results are represented by:

$\bar{x}$ = sample mean as an estimation of the batch mean;

s = standard deviation
$\bar{w}$ = average range
} as an estimation of the dispersion of the characteristics x in the batch.

NOTE – The average range is easier to calculate than the standard deviation. However, when suitable calculating means are available for making a decision and for preparing additional information, the use of the standard deviation enables the efficiency of the method to be increased for the same sample size.

2.7 Inspection by variables is based on normally distributed values. It is recommended to test whether the sample is normally distributed, using e.g. :

– The "w/s" test of David, Hartley and Pearson.

For details of the test procedures see [1]*

For this test only the figures $w(x_{max} - x_{min})$ and s are needed.

– The Wilk-Shapiro test.

For details of the test procedures see [2].

– The Pearson chi-square test.

3 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 410: 1973, *Sampling plans and procedures for inspection by attributes*

IEC 514: 1975, *Acceptance inspection of Class 2 alternating-current watthour meters*

IEC 1036: 1990, *Alternating current static watt-hour meters for active energy (classes 1 and 2)*

ISO 3534-1: 1993, *Statistics – Vocabulary and symbols – Part 1: Probability and general statistical terms*

ISO 3534-2: 1993, *Statistics – Vocabulary and symbols – Part 2: Statistical quality control*

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* Figures in square brackets refer to the bibliography given in annex B.