SLOVENSKI STANDARD

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Rotating electrical machines - Part 1: Rating and performance (IEC 60034-1:1996, modified)

ICS 29.160.01

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SIST EN 60034-1:2003(en)

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60034-1

May 1998

ICS 29.160.00

Supersedes EN 60034-1:1995 and its amendment

Descriptors: Rotating electrical machines, rating and performance

English version

Rotating electrical machines
Part 1: Rating and performance
(IEC 60034-1:1996, modified)

Machines électriques tournantes
Partie 1: Caractéristiques assignées et caractéristiques de fonctionnement
(CEI 60034-1:1996, modifiée)

Drehende elektrische Maschinen
Teil 1: Bemessung und Betriebsverhalten
(IEC 60034-1:1996, modifiziert)

This European Standard was approved by CENELEC on 1998-04-01. 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 the International Standard IEC 60034-1:1996, prepared by IEC TC 2, Rotating machinery, together with common modifications prepared by the Technical Committee CENELEC TC 2, Rotating machinery, was submitted to the formal vote and was approved by CENELEC as EN 60034-1 on 1998-04-01.

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) 1999-04-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2000-04-01

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

Endorsement notice

The text of IEC 60034-1:1996 was approved by CENELEC as a European Standard with agreed common modifications as given below.

COMMON MODIFICATIONS

6.2 **Form and symmetry of voltages and currents**

6.2.1.1 **Add** the following note after the third paragraph:

NOTE: Motors shall be able to operate with a negative sequence component of voltage of 2 %; but this may involve very severe condtions which could affect the life of motors.

7.6 **Determination of winding temperature**

7.6.1 **Add** at the end of the second paragraph: "unless otherwise agreed".

Replace the third and fourth paragraphs by:

For a.c. machines having a rated output less than 5 000 kW (or kVA) but greater than 200 kW (or kVA) the resistance method shall be used, unless the ETD method is agreed.

For a.c. machines having a rated output less than or equal to 200 kW (or kVA) the resistance method shall be used, unless the superposition method is agreed.

8.1 **Dielectric tests**

Number the present text as 8.1.1.

Replace the fifth paragraph by:

During the routine testing of quantity produced machines, the one-minute test may be replaced:

- for machines up to 200 kW (or kVA) and with a rated voltage up to 690 V by a test of approximately 5 s at the normal test voltage specified in table 14;

- for machines up to 5 kW (or kVA) by a test of approximately 1 s at 120 % of the normal test voltage in table 14;

the test voltage being applied by means of prods.

Add a new subclause 8.1.2:

8.1.2 For testing the insulation of bars and coils of high voltage machines, see EN 50209 and EN 60034-15.

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
-	-	Test of insulation of bars and coils of high-voltage machines	EN 50209	1998
IEC 60027-1	1992	Letter symbols to be used in electrical technology Part 1: General	-	-
IEC 60027-4	1985	Part 4: Symbols for quantities to be used for rotating electrical machines	HD 245.4 S1	1987
IEC 60034-2	1972	Rotating electrical machines Part 2: Methods for determining losses and efficiency of rotating electrical machinery from tests (excluding machines for traction vehicles)	EN 60034-2[1]	1996
IEC 60034-3	1988	Part 3: Specific requirements for turbine-type synchronous machines	EN 60034-3	1995
IEC 60034-5	1991[2]	Part 5: Classification of degrees of protection provided by enclosures of rotating electrical machines (IP code)	-	-
IEC 60034-6	1991	Part 6: Methods of cooling (IC Code)	EN 60034-6	1993
IEC 60034-12 (mod)	1980	Part 12: Starting performance of single-speed three-phase cage induction motors for voltages up to and including 690 V, 50 Hz	EN 60034-12[3]	1995
IEC 60034-15	1995	Part 15: Impulse voltage withstand levels of rotating a.c. machines with form-wound stator coils	EN 60034-15	1996

1) EN 60034-2 includes supplement IEC 60034-2A:1974.

2) IEC 60034-5:1981, mod., is harmonized as EN 60034-5:1986.

3) EN 60034-12 includes A1:1992 to IEC 60034-12.

Publication	Year	Title	EN/HD	Year
IEC 60034-17	1992	Part 17: Guide for the application of cage induction motors when fed from converters	-	-
IEC 60038 (mod)	1983	IEC Standard voltages[4]	HD 472 S1	1989
IEC 60050(411)	1996	International Electrotechnical Vocabulary (IEV) Chapter 411: Rotating machines	-	-
IEC 60072	series	Dimensions and output series for rotating electrical machines	-	-
IEC 60085	1984	Thermal evaluation and classification of electrical insulation	HD 566 S1	1990
IEC 60279	1969	Measurement of the winding resistance of an a.c. machine during operation at alternating voltage	-	-
IEC 60364-4-41 (mod)	1992	Electrical installations of buildings Part 4: Protection for safety Chapter 41: Protection against electric shock	HD 384.4.41 S2	1996
IEC 60445	1988	Identification of equipment terminals and of terminations of certain designated conductors, including general rules for an alphanumeric system	EN 60445	1990
IEC 60449	1973	Voltage bands for electrical installations of buildings	HD 193 S2[5]	1982
IEC 60971	1989	Semiconductor convertors Identification code for convertor connections	-	-
ISO 497	1973	Guide to the choice of series of preferred numbers and series containing more rounded values of preferred numbers	-	-

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

5) HD 193 S2 includes A1:1979 to IEC 60449.

CENELEC

Corrigendum to EN 60034-1:1998

English version

Subclause 6.2.1.1

In the note added by CENELEC, **replace** "Motors shall be" by "Motors should be".

February 2000

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Partie 1: Caractéristiques assignées et caractéristiques de fonctionnement

Rotating electrical machines –

Part 1: Rating and performance

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INTRODUCTION

In 1991, TC2 decided to edit IEC 34-1 to group the requirements in a more logical order. The result is edition 10 which now takes precedence over edition 9.

There is no difference between the technical requirements of edition 10 and of edition 9 (including amendment number 1) and it is intended that in the short term any further amendments will be introduced simultaneously in edition 9 and edition 10.

Edition 9 will be withdrawn within two years. This will allow time for the updating of any other standards which refer to specific clauses of IEC 34-1 and for users of the standard to make such changes as they judge necessary in their own documentation.

To facilitate these processes, cross-references (both ways) are listed in annex B.

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ROTATING ELECTRICAL MACHINES –

Part 1: Rating and performance

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

International standard IEC 34-1 has been prepared by IEC technical committee 2: Rotating machinery.

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

FDIS	Report on voting
2/933/FDIS	2/969/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.

Annexes A and B are for information only.

ROTATING ELECTRICAL MACHINES –

Part 1: Rating and performance

Section 1: General

1.1 Scope

This standard is applicable to all rotating electrical machines except those covered by other IEC standards – for example, IEC 349.

Machines within the scope of this standard may also be subject to superseding, modifying or additional requirements in other publications – for example, IEC 79, and IEC 92.

NOTE – If particular clauses of this standard are modified to meet special applications, for example machines subject to radioactivity or machines for aerospace, all other clauses apply in so far as they are compatible.

1.2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 34. 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 27-1: 1992, *Letter symbols to be used in electrical technology – Part 1: General*

IEC 27-4: 1985, *Letter symbols to be used in electrical technology – Part 4: Symbols for quantities to be used for rotating electrical machines*

IEC 34-2: 1972, *Rotating electrical machines – Part 2: Methods for determining losses and efficiency of rotating electrical machinery from tests (excluding machines for traction vehicles)*

IEC 34-3: 1988, *Rotating electrical machines – Part 3: Specific requirements for turbine-type synchronous machines*

IEC 34-5: 1991, *Rotating electrical machines – Part 5: Classification of degrees of protection provided by enclosures of rotating electrical machines (IP code)*

IEC 34-6: 1991, *Rotating electrical machines – Part 6: Methods of cooling (IC code)*