SLOVENSKI STANDARD
SIST EN 60034-22:1999

01-april-1999

Rotating electrical machines - Part 22: AC generators for reciprocating internal combustion (RIC) engine driven generating sets (IEC 60034-22:1996)

Rotating electrical machines -- Part 22: AC generators for reciprocating internal combustion (RIC) engine driven generating sets

Drehende elektrische Maschinen -- Teil 22: Wechselstromgeneratoren für Stromerzeugungsaggregate mit Hubkolben-Verbrennungsmotoren

Machines électriques tournantes -- Partie 22: Génératrices à courant alternatif pour moteurs à combustion interne et à pistons

Ta slovenski standard je istoveten z: **EN 60034-22:1997**

ICS:

27.020	Motorji z notranjim zgorevanjem	Internal combustion engines
29.160.40	Električni agregati	Generating sets

SIST EN 60034-22:1999 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60034-22

February 1997

ICS 29.160.20

English version

Rotating electrical machines
Part 22: AC generators for reciprocating internal combustion (RIC) engine driven generating sets
(IEC 34-22:1996)

Machines électriques tournantes
Partie 22: Génératrices à courant alternatif pour moteurs à combustion interne et à pistons
(CEI 34-22:1996)

Drehende elektrische Maschinen
Teil 22: Wechselstromgeneratoren für Stromerzeugungsaggregate mit Hubkolben-Verbrennungsmotoren
(IEC 34-22:1996)

This European Standard was approved by CENELEC on 1996-10-01. 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, 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 2/943/FDIS, future edition 1 of IEC 34-22, prepared by IEC TC 2, Rotating machinery, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60034-22 on 1996-10-01.

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) 1997-08-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 1997-08-01

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 annex A is informative.
Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 34-22:1996 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 27-1	1992[1)]	Letter symbols to be used in electrical technology Part 1: General	-	-
IEC 27-4	1985	Part 4: Symbols of quantities to be used for rotating electrical machines	HD 245.4 S1	1987
IEC 34-1	1996[2)]	Rotating electrical machines Part 1: Rating and performance	-	-
IEC 85	1984	Thermal evaluation and classification of electrical insulation	HD 566 S1	1990
CISPR 14	1993	Limits and methods of measurement of radio disturbance characteristics of electrical motor-operated and thermal appliances for household and similar purposes, electric tools and similar electric apparatus	EN 55014	1993
CISPR 15	1992	Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment	EN 55015[3)]	1993
ISO 8528-1	1993	Reciprocating internal combustion engine driven alternating current generating sets Part 1: Application, ratings and performance	-	-

1) IEC 27-1:1971 + A1:1974 + A2:1977 are harmonized as HD 245.1 S3:1979.

2) IEC 34-1:1994 + corrigendum December 1994 are harmonized as EN 60034-1:1995 and its corrigendum April 1995.

3) EN 55015 is superseded by EN 55015:1996, which is based on CISPR 15:1996.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ROTATING ELECTRICAL MACHINES –

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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 34-22 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
2/943/FDIS	2/971/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 is for information only.

ROTATING ELECTRICAL MACHINES –

Part 22: AC generators for reciprocating internal combustion (RIC) engine driven generating sets

1 Scope

This part of IEC 34 establishes the principal characteristics of a.c. generators under the control of their voltage regulators when used for reciprocating internal combustion (RIC) engine driven generating set applications and supplements the requirements given in IEC 34-1. It covers the use of such generators for land and marine use, but excludes generating sets used on aircraft or used to propel land vehicles and locomotives.

NOTES

1 For some specific applications (e.g. essential hospital supplies, high-rise buildings, etc.) supplementary requirements may be necessary. The provisions of this standard should be regarded as a basis for such requirements.

2 Attention is drawn to the need to take note of additional regulations or requirements imposed by various regulatory bodies. Such regulations or requirements may form the subject of agreement between the customer and the manufacturer when conditions of use of the end product invoke such requirements.

3 Examples of regulatory authorities:

– classification societies, for generating sets used on ships and offshore installations;

– government agencies;

– inspection agencies, local utilities, etc.

Annex A discusses the behaviour of generators covered by this standard when subjected to sudden load changes.

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 part of IEC 34 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, *Letter symbols to be used in electrical technology*

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 34-1: 1996, *Rotating electrical machines – Part 1: Rating and performance*

IEC 85: 1984, *Thermal evaluation and classification of electrical insulation*

CISPR 14: 1993, *Limits and methods of measurement of radio disturbance characteristics of electric motor-operated and thermal appliances for household and similar purposes, electric tools and similar electrical apparatus*

CISPR 15: 1992, *Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment*

ISO 8528-1: 1993, *Reciprocating internal combustion engine driven alternating current generating sets – Part 1: Application, ratings and performance*

3 Definitions

For the purpose of this part of IEC 34, the following definitions apply.

NOTE – In this standard, suffix 'N' is used for 'rated' in accordance with IEC 27 whereas in ISO 8528, suffix 'r' is so used.

3.1 *Rated power and speed*

3.1.1 **rated output S_N:** The product of the rated r.m.s. voltage, the rated r.m.s. current and a constant m, expressed in volt-amperes (VA) or its decimal multiples,

where

m = 1 for single-phase;

m = $\sqrt{2}$ for two-phase;

m = $\sqrt{3}$ for three-phase.

3.1.2 **rated active power P_N:** The product of the rated r.m.s. voltage, the in-phase component of the rated r.m.s. current and a constant m, expressed in watts (W) or its decimal multiples,

where

m = 1 for single-phase;

m = $\sqrt{2}$ for two-phase;

m = $\sqrt{3}$ for three-phase.

3.1.3 **rated power factor cos ϕ_N:** The ratio of the rated active power to the rated apparent power,

$$\cos \phi_N = \frac{P_N}{S_N}$$