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I.S. EN 60034-29:2008

Rotating electrical machines -- Part 29: Equivalent loading and superposition techniques - Indirect testing to determine temperature rise (IEC 60034 -29:2008 (EQV))

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60034-29

July 2008

ICS 29.160

Supersedes EN 61986:2002

English version

Rotating electrical machines - Part 29: Equivalent loading and superposition techniques - Indirect testing to determine temperature rise

(IEC 60034-29:2008)

Machines électriques tournantes - Partie 29: Techniques par charge équivalente et par superposition - Essais indirects pour déterminer l'échauffement
(CEI 60034-29:2008)

Drehende elektrische Maschinen - Teil 29: Verfahren der äquivalenten Belastung und Überlagerung - Indirekte Prüfung zur Ermittlung der Übertemperatur
(IEC 60034-29:2008)

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Foreword

The text of document 2/1476/FDIS, future edition 1 of IEC 60034-29, prepared by IEC TC 2, Rotating machinery, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60034-29 on 2008-06-01.

This European Standard supersedes EN 61986:2002.

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)	2009-03-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2011-06-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60034-29:2008 was approved by CENELEC as a European Standard without any modification.

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Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

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 60034-1	2004	Rotating electrical machines - Part 1: Rating and performance	EN 60034-1	2004
IEC 60034-2-1	-[1)]	Rotating electrical machines - Part 2-1: Standard methods for determining losses and efficiency from tests (excluding machines for traction vehicles)	EN 60034-2-1	2007[2)]

[1)] Undated reference.

[2)] Valid edition at date of issue.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ROTATING ELECTRICAL MACHINES –

Part 29: Equivalent loading and superposition techniques – Indirect testing to determine temperature rise

FOREWORD

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International Standard IEC 60034-29 has been prepared by IEC technical committee 2: Rotating machinery. It cancels and replaces IEC 61986:2002 which is withdrawn.

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

FDIS	Report on voting
2/1476/FDIS	2/1491A/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 publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of IEC 60034 series, under the general title *Rotating electrical machines*, can be found on the IEC website.

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The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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

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INTRODUCTION

The object of this standard is to provide various indirect load tests, the purpose of which is to determine the temperature rise of rotating electrical machines, including a.c. induction machines, a.c. synchronous machines and d.c. machines. The test methods in some cases provide, in addition, means of measuring or estimating other parameters such as losses and vibration, but the methods are not designed specifically to provide such data.

The proposed test methods are considered equivalent, the choice relying only on the location, the testing equipment and the machine type, and the test result accuracy.

This standard should not be interpreted as requiring any or all of the tests on any given machine. Particular tests are subject to a special agreement between the manufacturer and the purchaser.

NOTE As the methods reproduce only approximately the thermal conditions of the machines under rated condition, temperature-rise measurement results achieved from tests with these methods may be taken as the basis for the evaluation of machine heating in accordance with 8.10 of IEC 60034-1 by agreement between the manufacturer and the purchaser.

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ROTATING ELECTRICAL MACHINES –

Part 29: Equivalent loading and superposition techniques – Indirect testing to determine temperature rise

1 Scope

This International Standard applies to machines covered by IEC 60034-1 when they cannot be loaded to a specific condition (rated or otherwise). It is applicable to both motors and generators.

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 60034-1:2004, *Rotating electrical machines – Part 1: Rating and performance*

IEC 60034-2-1, *Rotating electrical machines – Part 2-1: Standard methods for determining losses and efficiency from tests (excluding machines for traction vehicles)*

3 Symbols and units

For the purposes of this document, the following symbols and units apply.

K	slope factor of temperature rise, K/W

NOTE 1 The full name of *K* is “slope factor of the straight line characterizing variation of temperature rise with losses”, see IEC 60027-4, item 901.

$\Delta\theta$	temperature rise, K
θ	temperature, °C
P	power, loss, W
I	current, A
R	resistance, Ω
X	reactance, Ω
U	voltage, V
E	e.m.f., V
f	frequency, Hz
$f_{1,2}$	main/auxiliary frequency, Hz
Δt	time interval, s
T	torque, N·m
J	moment of inertia, kg·m^2
$\cos\varphi$	power factor
γ	method uncertainty, %

NOTE 2 The definition implies that γ > 0 means test temperature rise is higher than at actual load condition.

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