SLOVENSKI STANDARD
SIST EN IEC 60034-4-1:2019

01-marec-2019

Nadomešča:
SIST EN 60034-4:2008

Električni rotacijski stroji - 4-1. del: Metode za določanje parametrov sinhronskih strojev s preskusi (IEC 60034-4-1:2018)

Rotating electrical machines - Part 4-1: Methods for determining synchronous machine quantities from tests (IEC 60034-4-1:2018)

Drehende elektrische Maschinen - Teil 4-1: Verfahren zur Ermittlung der Kenngrößen von Synchronmaschinen durch Messungen (IEC 60034-4-1:2018)

Machines électriques tournantes - Partie 4-1: Méthodes pour la détermination, à partir d'essais, des grandeurs des machines synchrones (IEC 60034-4-1:2018)

Ta slovenski standard je istoveten z: **EN IEC 60034-4-1:2018**

ICS:

29.160.01	Rotacijski stroji na splošno	Rotating machinery in general

SIST EN IEC 60034-4-1:2019 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 60034-4-1

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English Version

Rotating electrical machines - Part 4-1: Methods for determining electrically excited synchronous machine quantities from tests (IEC 60034-4-1:2018)

Machines électriques tournantes - Partie 4-1: Méthodes pour la détermination, à partir d'essais, des grandeurs des machines synchrones à excitation électrique (IEC 60034-4-1:2018)

Drehende elektrische Maschinen - Teil 4-1: Verfahren zur Ermittlung der Kenngrößen von Synchronmaschinen durch Messungen (IEC 60034-4-1:2018)

This European Standard was approved by CENELEC on 2018-06-01. 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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

The text of document 2/1829/CDV, future edition 1 of IEC 60034-4-1, prepared by IEC/TC 2 "Rotating machinery" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60034-4-1:2018.

The following dates are fixed:

• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2019-03-01
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2021-06-01

This document supersedes EN 60034-4:2008

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 60034-4-1:2018 was approved by CENELEC as a European Standard without any modification.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 60034-1	2017	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)	EN 60034-2-1	-
IEC 60051	series	Direct acting indicating analogue electrical measuring instruments and their accessories	EN 60051	series

IEC 60034-4-1

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Rotating electrical machines –
Part 4-1: Methods for determining electrically excited synchronous machine quantities from tests

Machines électriques tournantes –
Partie 4-1: Méthodes pour la détermination, à partir d'essais, des grandeurs des machines synchrones à excitation électrique

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of 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, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). 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. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.

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International Standard IEC 60034-4-1 has been prepared by IEC technical committee 2: Rotating machinery.

IEC 60034-4-1 first edition cancels and replaces the third edition of IEC 60034-4 published in 2008. This edition constitutes a technical revision.

This publication includes the following significant technical changes with respect to IEC 60034-4 edition 3:

a) improvement of several procedures with respect to evaluation of quantities;
b) deletion of uncommon procedures;
c) applicability of procedures for permanent magnet machines.

The text of this International Standard is based on the following documents:

CDV	Report on voting
2/1829/CDV	2/1869/RVC

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

NOTE A table of cross-references of all IEC TC 2 publications can be found on the IEC TC 2 dashboard on the IEC website.

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

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

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

ROTATING ELECTRICAL MACHINES –

Part 4-1: Methods for determining electrically excited synchronous machine quantities from tests

1 Scope

This part of IEC 60034 applies to three-phase synchronous machines of 1 kVA rating and larger.

Most of the methods are intended to be used for machines having an excitation winding with slip-rings and brushes for their supply. Synchronous machines with brushless excitation require special effort for some of the tests. For machines with permanent magnet excitation, there is a limited applicability of the described tests, and special precautions should be taken against irreversible demagnetization.

Excluded are axial-field machines and special synchronous machines such as inductor type machines, transversal flux machines and reluctance machines.

It is not intended that this document be interpreted as requiring any or all of the tests described therein on any given machine. The particular tests to be carried out are subject to agreement between manufacturer and customer.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 60034-1:2017, *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)*

IEC 60051 (all parts), *Direct acting indicating analogue electrical measuring instruments and their accessories*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1
<synchronous motors> initial starting impedance
quotient of the applied armature voltage and the sustained average armature current, the machine being at standstill

3.2
direct-axis synchronous reactance
quotient of the sustained value of that fundamental AC component of armature voltage, which is produced by the total direct-axis primary flux due to direct-axis armature current, and the value of the fundamental AC component of this current, the machine running at rated speed

[SOURCE: IEC 60050-411:1996, 411-50-07]

3.3
direct-axis transient reactance
quotient of the initial value of a sudden change in that fundamental AC component of armature voltage, which is produced by the total direct-axis primary flux, and the value of the simultaneous change in fundamental AC component of direct-axis armature current, the machine running at rated speed and the high decrement components during the first cycles being excluded

[SOURCE: IEC 60050-411:1996, 411-50-09]

3.4
direct-axis sub-transient reactance
quotient of the initial value of a sudden change in that fundamental AC component of armature voltage, which is produced by the total direct-axis armature flux, and the value of the simultaneous change in fundamental AC component of direct-axis armature current, the machine running at rated speed

[SOURCE: IEC 60050-411:1996, 411-50-11]

3.5
quadrature-axis synchronous reactance
quotient of the sustained value of that fundamental AC component of armature voltage, which is produced by the total quadrature-axis primary flux due to quadrature-axis armature current, and the value of the fundamental AC component of this current, the machine running at rated speed

[SOURCE: IEC 60050-411:1996, 411-50-08]

3.6
quadrature-axis transient reactance
quotient of the initial value of a sudden change in that fundamental AC component of armature voltage, which is produced by the total quadrature-axis armature winding flux, and the value of the simultaneous change in fundamental AC component of quadrature-axis armature current, the machine running at rated speed and the high decrement components during the first cycles being excluded

[SOURCE: IEC 60050-411:1996, 411-50-10]

3.7
quadrature-axis sub-transient reactance
quotient of the initial value of a sudden change in that fundamental AC component of armature voltage, which is produced by the total quadrature-axis primary flux and the value of the simultaneous change in fundamental AC component of quadrature-axis armature current, the machine running at rated speed

[SOURCE: IEC 60050-411:1996, 411-50-12]