SEK TS 60034-25, utg 1:2024

Utgiven	Sida	Ansvarig kommitté
2024-04-24	1 (111)	SEK TK 2

Rotating electrical machines – Part 25: AC electrical machines used in power drive systems – Application guide

(IEC Technical Specification 60034-25:2024)

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ICS 29.160.01

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TECHNICAL SPECIFICATION

SPÉCIFICATION TECHNIQUE

TECHNISCHE SPEZIFIKATION

CLC IEC/TS 60034-25

February 2024

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Supersedes CLC/TS 60034-17:2004; CLC/TS 60034-25:2008

English Version

Rotating electrical machines - Part 25: AC electrical machines used in power drive systems - Application guide (IEC/TS 60034-25:2022)

Machines électriques tournantes - Partie 25: Machines électriques à courant alternatif utilisées dans les systèmes d'entraînement de puissance - Guide d'application (IEC/TS 60034-25:2022)

Drehende elektrische Maschinen - Teil 25: Wechselstrommaschinen zur Verwendung in Antriebssystemen - Anwendungsleitfaden (IEC/TS 60034-25:2022)

This Technical Specification was approved by CENELEC on 2024-01-22.

CENELEC members are required to announce the existence of this TS in the same way as for an EN and to make the TS available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

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

Ref. No. CLC IEC/TS 60034-25:2024 E

European foreword

This document (CLC IEC/TS 60034-25:2024) consists of the text of IEC/TS 60034-25:2022 prepared by IEC/TC 2 "Rotating machinery".

This document supersedes CLC/TS 60034-17:2004 and CLC/TS 60034-25:2008 and all of their amendments and corrigenda (if any).

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.

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

Endorsement notice

The text of the International Technical Specification IEC/TS 60034-25:2022 was approved by CENELEC as a European Technical Specification without any modification.

In the official version, for Bibliography, the following notes have to be added for the standard indicated:

IEC 61800-2:2021	NOTE	Approved as EN IEC 61800-2:2021 (not modified)
IEC/TR 61800-6	NOTE	Approved as CLC/TR 61800-6

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.cencenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 60034-1	2022	Rotating electrical machines - Part 1: Rating and performance	EN IEC 60034-1	—[1]
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 60034-2-2	-	Rotating electrical machines - Part 2-2: Specific methods for determining separate losses of large machines from tests - Supplement to IEC 60034-2-1	EN 60034-2-2	-
IEC 60034-2-3	-	Rotating electrical machines - Part 2-3: Specific test methods for determining losses and efficiency of converter-fed AC motors	EN IEC 60034-2-3	-
IEC 60034-6	-	Rotating electrical machines - Part 6: Methods of cooling (IC Code)	EN 60034-6	-
IEC 60034-9	2021	Rotating electrical machines - Part 9: Noise limits	EN IEC 60034-9	—[2]
IEC 60034-12	-	Rotating electrical machines - Part 12: Starting performance of single-speed three-phase cage induction motors	EN 60034-12	-
IEC 60034-14	2018	Rotating electrical machines - Part 14: Mechanical vibration of certain machines with shaft heights 56 mm and higher - Measurement, evaluation and limits of vibration severity	EN IEC 60034-14	2018

[1] To be published. Stage at the time of publication: FprEN IEC 60034-1:2021.
[2] To be published. Stage at the time of publication: FprEN IEC 60034-9:2021.

Publication	Year	Title	EN/HD	Year
IEC 60034-18-41	2014	Rotating electrical machines - Part 18-41: Partial discharge free electrical insulation systems (Type I) used in rotating electrical machines fed from voltage converters - Qualification and quality control tests	EN 60034-18-41	2014
+ A1	2019		+ A1	2019
IEC 60034-18-42	2017	Rotating electrical machines - Part 18-42: Partial discharge resistant electrical insulation systems (Type II) used in rotating electrical machines fed from voltage converters - Qualification tests	EN 60034-18-42	2017
+ A1	2020		+ A1	2020
IEC 60079	series	Explosive atmospheres	EN IEC 60079	series
IEC 60079-7	-	Explosive atmospheres - Part 7: Equipment protection by increased safety "e"	EN 60079-7	-
IEC/TR 61000-5-1	-	Electromagnetic compatibility (EMC) - Part 5: Installation and mitigation guidelines - Section 1: General considerations - Basic EMC publication	-	-
IEC/TR 61000-5-2	-	Electromagnetic compatibility (EMC) - Part 5: Installation and mitigation guidelines - Section 2: Earthing and cabling	-	-
IEC 61800-3	-	Adjustable speed electrical power drive systems - Part 3: EMC requirements and specific test methods for PDS and machine tools	EN IEC 61800-3	-
IEC 61800-5-1	-	Adjustable speed electrical power drive systems - Part 5-1: Safety requirements - Electrical, thermal and energy	EN IEC 61800-5-1	-
IEC/TS 61800-8	2010	Adjustable speed electrical power drive systems - Part 8: Specification of voltage on the power interface	-	-
IEC/TS 62578	2015	Power electronics systems and equipment - Operation conditions and characteristics of active infeed converter (AIC) applications including design recommendations for their emission values below 150 kHz	-	-

IEC TS 60034-25

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TECHNICAL SPECIFICATION

colour inside

Rotating electrical machines –
Part 25: AC electrical machines used in power drive systems – Application guide

INTERNATIONAL
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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ROTATING ELECTRICAL MACHINES –

Part 25: AC electrical machines used in power drive systems – Application guide

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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IEC TS 60034-25 has been prepared by IEC technical committee 2: Rotating machinery. It is a Technical Specification.

This fourth edition of IEC TS 60034-25 cancels and replaces the third edition, published in 2014.

This edition includes the following significant technical changes with respect to the previous edition:

a) The definitions of a converter capable motor and a converter duty motor are added.
b) Clause 18 modified to include the performance expectations of a converter capable motor.
c) Clause 8 modified to update shaft currents section.
d) Annex D added to define the derating requirements.

The text of this Technical Specification is based on the following documents:

Draft	Report on voting
2/2067/DTS	2/2097/RVDTS

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this Technical Specification is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

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

INTRODUCTION

The performance characteristics and operating data for converter-fed electrical machines are influenced by the complete drive system, comprising supply system, converter, cabling, electrical machine, mechanical shafting and control equipment. Each of these components exists in numerous technical variants. Any values quoted in this document are thus indicative only.

In view of the complex technical interrelations within the system and the variety of operating conditions, it is beyond the scope and object of this document to specify numerical or limiting values for all the quantities which are of importance for the design of the power drive system.

To an increasing extent, it is the practice that power drive systems consist of components produced by different manufacturers. The object of this document is to explain, as far as possible, the influence of these components on the design of the electrical machine and its performance characteristics.

This document deals with both AC electrical machines which are specifically designed for converter supply and converter-fed electrical machines within the scope of IEC 60034-12, which are designed originally for mains supply.

ROTATING ELECTRICAL MACHINES –

Part 25: AC electrical machines used in power drive systems – Application guide

1 Scope

This part of IEC 60034 describes the performance characteristics of AC electrical machines for use on converter supplies. For electrical machines specifically designed for converter duty application design features are defined. It also specifies the interface parameters and interactions between the electrical machine and the converter including installation guidance as part of a power drive system, but except for the voltage at the power interface which is described in IEC TS 61800-8.

The general requirements of relevant parts of the IEC 60034 series of standards also apply to electrical machines within the scope of this document.

For electrical machines operating in potentially explosive atmospheres, additional requirements as described in the IEC 60079 series for dust ignition proof apply.

This document is not primarily concerned with safety. However, some of its recommendations may have implications for safety, which are considered as necessary.

Where a converter manufacturer provides specific installation recommendations, they take precedence over the recommendations of this document.

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 60034-1:2022, *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 60034-2-2, *Rotating electrical machines – Part 2-2: Specific methods for determining separate losses of large machines from tests – Supplement to IEC 60034-2-1*

IEC 60034-2-3, *Rotating electrical machines – Part 2-3: Specific test methods for determining losses and efficiency of converter-fed AC induction motors*

IEC 60034-6, *Rotating electrical machines – Part 6: Methods of cooling (IC Code)*

IEC 60034-9:2021, *Rotating electrical machines – Part 9: Noise limits*

IEC 60034-12, *Rotating electrical machines – Part 12: Starting performance of single-speed three-phase cage induction motors*

IEC 60034-14:2018, *Rotating electrical machines – Part 14: Mechanical vibration of certain machines with shaft heights 56 mm and higher – Measurement, evaluation and limits of vibration severity*

IEC 60034-18-41:2014, *Rotating electrical machines – Part 18-41: Partial discharge free electrical insulation systems (Type I) used in rotating electrical machines fed from voltage converters – Qualification and quality control tests*
IEC 60034-18-41:2014/AMD1:2019

IEC 60034-18-42:2017, *Rotating electrical machines – Part 18-42: Partial discharge resistant electrical insulation systems (Type II) used in rotating electrical machines fed from voltage converters – Qualification tests*
IEC 60034-18-42:2017/AMD1:2020

IEC 60079 (all parts): *Explosive atmospheres*

IEC 60079-7, *Explosive atmospheres – Part 7: Equipment protection by increased safety "e"*

IEC TR 61000-5-1, *Electromagnetic compatibility (EMC) – Part 5: Installation and mitigation guidelines – Section 1: General considerations – Basic EMC publication*

IEC TR 61000-5-2, *Electromagnetic compatibility (EMC) – Part 5: Installation and mitigation guidelines – Section 2: Earthing and cabling*

IEC 61800-3, *Adjustable speed electrical power drive systems – Part 3: EMC requirements and specific test methods*

IEC 61800-5-1, *Adjustable speed electrical power drive systems – Part 5-1: Safety requirements – Electrical, thermal and energy*

IEC TS 61800-8:2010, *Adjustable speed electrical power drive systems – Part 8: Specification of voltage on the power interface*

IEC TS 62578:2015, *Power electronics systems and equipment – Operation conditions and characteristics of active infeed converter (AIC) applications including design recommendations for their emission values below 150 kHz*