



UL 60034-1

STANDARD FOR SAFETY

Rotating Electrical Machines – Part 1: Rating and Performance

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UL Standard for Safety for Rotating Electrical Machines – Part 1: Rating and Performance, UL 60034-1

Third Edition, Dated February 9, 2024

Summary of Topics

This Third edition of ANSI/UL 60034-1 dated February 9, 2024 is an adoption of IEC 60034-1, Rotating Electrical Machines – Part 1: Rating and Performance (Fourteenth Edition, issued February, 2022) with no US National Differences.

The requirements are substantially in accordance with Proposal(s) on this subject dated November 3, 2023.

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ANSI/UL 60034-1-2024

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UL 60034-1

Standard for Rotating Electrical Machines – Part 1: Rating and Performance

First Edition – July, 2016
Second Edition – September, 2018

Third Edition

February 9, 2024

This ANSI/UL Standard for Safety consists of the Third Edition.

The most recent designation of ANSI/UL 60034-1 as an American National Standard (ANSI) occurred on February 9, 2024. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, Title Page, or Preface. The IEC Foreword is also excluded from the ANSI approval of IEC-based standards.

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Annex A (informative) Guidance for the application of duty type S10 and for establishing the value of relative thermal life expectancy *TL*

Annex B (informative) Electromagnetic compatibility (EMC) limits

Bibliography

Preface (UL)

This UL Standard is based on IEC Publication 60034-1: 14th edition, Rotating electrical machines – Part 1: Rating and performance. IEC publication 60034-1 is copyrighted by the IEC.

This edition has been issued to satisfy ULSE Standards policy.

This is the UL Standard for Safety for Rotating Electrical Machines – Part 1: Rating and Performance. This UL Part 1 is to be used in conjunction with the appropriate UL Part 2, UL 60034-2-1, which contains clauses to supplement or modify the corresponding clauses in the Part 1, to provide relevant requirements for each type of product.

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Note – Although the intended primary application of this Standard is stated in its Scope, it is important to note that it remains the responsibility of the users of the Standard to judge its suitability for their particular purpose.

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FOREWORD

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ROTATING ELECTRICAL MACHINES – Part 1: Rating and performance

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

This fourteenth edition cancels and replaces the thirteenth edition published in 2017. This edition constitutes a technical revision.

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

Clause or subclause	Change
1	Clarification of the scope
2	General use of dated references
3.29	Clarification on identification of maximum and minimum current
3.34	Definition of main insulation

Clause or subclause	Change
3.35	Definition of converter capable machine
3.36	Definition of converter duty machine
3.37	Definition of shaft voltage
4.2	Explanation for using duty types S9 and S10 for converter duty machines
5.6.3	New subclause for clarification of the terms range of rated voltages and voltage variations
6.2	Requirement to consider reduced arcing distance in machine design for altitudes >1 000 m
7.1	Clarification on bus transfer or fast reclosing Clarification on the capability to withstand impulse voltages
7.3	New subclause on voltage deviation during starting
7.4	Extended variation of supply frequency Note added on design for operation with extended voltage and frequency Recommended derating added for high variations of voltage and frequency
7.6	Clarification that enamelled wires are no bare living material
8.3.1	Clarification on electrical supply during thermal tests added
9.1	Changes in Table 16, especially inclusion of PM and reluctance synchronous machines
9.2	Requirement on test equipment for withstand voltage test added Test voltage for variable speed AC machines added Clarification to withstand voltage test for machines after stock holding
9.5	Extended to requirements on minimum locked rotor torque
9.10	Note added on criteria for commutation test
9.11.3	Clarification added that synchronous motors do not need a THD test
9.12	New subclause on protective earth test
9.13	New subclause on measurement of insulation resistance and polarization index
9.14	New subclause on shaft-voltage measurement
10	Clause has been rearranged completely Clarification on unit symbol for speed added
11.1	Clarification on protective earth test after installation added
12.1	Clarification on the tolerances due to the accuracy of the test equipment Note on measurement uncertainty added
12.2	Change in the tolerance on efficiency Clarification on the tolerance on locked-rotor current New tolerance on sound pressure level
14	Improved title of clause

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

Draft	Report on voting
2/2084/FDIS	2/2090/RVD

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 International Standard 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 of 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.

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