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Rotating electrical machines - Part 23: Repair, overhaul  
and reclamation

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

|   |  |
|---|--|
| See Eesti standard EVS-EN IEC 60034-23:2019 sisaldab Euroopa standardi EN IEC 60034-23:2019 ingliskeelset teksti.   | This Estonian standard EVS-EN IEC 60034-23:2019 consists of the English text of the European standard EN IEC 60034-23:2019.        |
| Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas   | This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation. |
| Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 22.03.2019. | Date of Availability of the European standard is 22.03.2019.   |
| Standard on kättesaadav Eesti Standardikeskusest.   | The standard is available from the Estonian Centre for Standardisation.  |

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile [standardiosakond@evs.ee](mailto:standardiosakond@evs.ee).

ICS 29.160.01

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ICS 29.160.01

English Version

Rotating electrical machines - Part 23: Repair, overhaul and  
reclamation  
(IEC 60034-23:2019)

Machines électriques tournantes - Partie 23: Réparation,  
révision et remise en état  
(IEC 60034-23:2019)

Drehende elektrische Maschinen - Teil 23: Reparatur,  
Überholung und Sanierung  
(IEC 60034-23:2019)

This European Standard was approved by CENELEC on 2019-02-28. 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

## European foreword

The text of document 2/1923/FDIS, future edition 1 of IEC 60034-23, prepared by IEC/TC 2 "Rotating machinery" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60034-23:2019.

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) 2019-11-28
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2022-02-28

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 60034-23:2019 was approved by CENELEC as a European Standard without any modification.

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

|                 |      |                                |
|-----------------|------|--------------------------------|
| IEC 60034-2-1   | NOTE | Harmonized as EN 60034-2-1     |
| IEC 60034-2-2   | NOTE | Harmonized as EN 60034-2-2     |
| IEC 60034-3     | NOTE | Harmonized as EN 60034-3       |
| IEC 60034-4-1   | NOTE | Harmonized as EN IEC 60034-4-1 |
| IEC 60034-5     | NOTE | Harmonized as EN 60034-5       |
| IEC 60034-7     | NOTE | Harmonized as EN 60034-7       |
| IEC 60034-8     | NOTE | Harmonized as EN 60034-8       |
| IEC 60034-9     | NOTE | Harmonized as EN 60034-9       |
| IEC 60034-12    | NOTE | Harmonized as EN 60034-12      |
| IEC 60034-14    | NOTE | Harmonized as EN IEC 60034-14  |
| IEC 60034-15    | NOTE | Harmonized as EN 60034-15      |
| IEC 60034-16-1  | NOTE | Harmonized as EN 60034-16-1    |
| IEC 60034-18-1  | NOTE | Harmonized as EN 60034-18-1    |
| IEC 60034-18-21 | NOTE | Harmonized as EN 60034-18-21   |
| IEC 60034-18-22 | NOTE | Harmonized as EN 60034-18-22   |
| IEC 60034-18-31 | NOTE | Harmonized as EN 60034-18-31   |

|                 |      |                                 |
|-----------------|------|---------------------------------|
| IEC 60034-18-32 | NOTE | Harmonized as EN 60034-18-32    |
| IEC 60034-18-34 | NOTE | Harmonized as EN 60034-18-34    |
| IEC 60034-18-41 | NOTE | Harmonized as EN 60034-18-41    |
| IEC 60034-18-42 | NOTE | Harmonized as EN 60034-18-42    |
| IEC 60034-19    | NOTE | Harmonized as EN 60034-19       |
| IEC 60034-27-1  | NOTE | Harmonized as EN IEC 60034-27-1 |
| IEC 60034-27-3  | NOTE | Harmonized as EN 60034-27-3     |
| IEC 60034-27-4  | NOTE | Harmonized as EN IEC 60034-27-4 |
| IEC 60349-1     | NOTE | Harmonized as EN 60349-1        |
| ISO 4287        | NOTE | Harmonized as EN ISO 4287       |
| ISO 4526        | NOTE | Harmonized as EN ISO 4526       |
| ISO 6158        | NOTE | Harmonized as EN ISO 6158       |
| ISO 9001        | NOTE | Harmonized as EN ISO 9001       |

## 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](http://www.cenelec.eu).

| <u>Publication</u> | <u>Year</u> | <u>Title</u>  | <u>EN/HD</u>  | <u>Year</u> |
|--------------------|-------------|---|---------------|-------------|
| IEC 60034          |             | series Rotating electrical machines   | EN IEC 60034  | series      |
| IEC 60034-1        | -           | Rotating electrical machines - Part 1: Rating and performance   | -             | -           |
| IEC 60034-6        | -           | Rotating electrical machines - Part 6: Methods of cooling (IC Code)   | EN 60034-6    | -           |
| IEC 60034-11       | -           | Rotating electrical machines - Part 11: Thermal protection  | EN 60034-11   | -           |
| IEC 60034-30-1     | -           | Rotating electrical machines - Part 30-1: Efficiency classes of line operated AC motors (IE code)                                 | EN 60034-30-1 | -           |
| IEC/TS 60034-30-2  | -           | Rotating electrical machines - Part 30-2: Efficiency classes of variable speed AC motors (IE-code)                                | -             | -           |
| IEC 60050-411      | 1996        | International Electrotechnical Vocabulary - Chapter 411: Rotating machinery   | -             | -           |
| IEC 60060-1        | -           | High-voltage test techniques - Part 1: General definitions and test requirements  | EN 60060-1    | -           |
| IEC 60072-2        | -           | Dimensions and output series for rotating electrical machines - Part 2: Frame numbers 355 to 1000 and flange numbers 1180 to 2360 | -             | -           |
| IEC 60079-19       | -           | Explosive atmospheres - Part 19: Equipment repair, overhaul and reclamation   | EN 60079-19   | -           |
| IEC 60136          | 1986        | Dimensions of brushes and brush-holders for electrical machinery  | -             | -           |
| ISO 21940-11       | -           | Mechanical vibration - Rotor balancing - Part 11: Procedures and tolerances for rotors with rigid behaviour                       | -             | -           |

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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**ROTATING ELECTRICAL MACHINES –  
Part 23: Repair, overhaul and reclamation****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 60034-23 has been prepared by IEC technical committee 2: Rotating machinery.

This first edition cancels and replaces IEC TS 60034-23 published in 2003. This edition constitutes a technical revision.

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

- the title of the standard has been changed to *Rotating electrical machines – Part 23: Repair, overhaul and reclamation*;
- Clause 1 Scope
  - Hydrogen cooled turbine generators added to special applications,
  - maintaining or improving the rated energy efficiency added
  - ensuring environmental considerations are taken into account added;

- Clause 4 General Principles added to cover: hazardous areas, traction motors, machine efficiency, environment, end of life recycling. and circular economy considerations;
- Clause 5 General: Scope of work, health and safety, standards, quality, information required and documentation now covered;
- Original Annexes B and C incorporated into the standard;
- Clause 9 Final tests updated;
- Clause 10 Additional requirements for the repair and testing of DC machines added;
- Clause 11 Additional requirements for the repair and testing of High Voltage AC machines added;
- Clause 12 Customer reports and handover added;
- New Annex B standard tolerances added.

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

| FDIS        | Report on voting |
|-------------|------------------|
| 2/1923/FDIS | 2/1924/RVD       |

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.

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 "<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.

# ROTATING ELECTRICAL MACHINES –

## Part 23: Repair, overhaul and reclamation

### 1 Scope

This part of IEC 60034 covers the procedures necessary to ensure the satisfactory repair, overhaul, and reclamation of all types and sizes of rotating electrical machines covered by the IEC 60034 series. The standard creates a generic industry procedure covering common aspects of a complete repair. The scope of work depends on the machine type, rating, condition, and the importance of plant reliability and safety. It includes

- determining cause of failure, where necessary;
- determining the extent of repair, as applicable;
- defining revised performance, operating and ambient conditions, if required;
- reviewing the original design, and upgrading the specification of the design, if required;
- proving the quality and performance of the repaired machine, maintaining or improving the rated energy efficiency;
- ensuring environmental considerations are taken into account.

This document does not supersede the requirements prescribed in IEC 60079-19 or elsewhere concerning the repair and overhaul for machines used in explosive atmospheres.

Machines for special applications such as hermetic, submersible, nuclear, hydrogen cooled machines, military, aviation and traction motors might have additional requirements, which are the subject of agreement between the service facility and user.

This document is not intended to take the place of the original machine manufacturer's instructions and recommendations.

Re-designs and performance changes requiring machine designer input are beyond the scope 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 (all parts), *Rotating electrical machines*

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

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

IEC 60034-11, *Rotating electrical machines – Part 11: Thermal protection*

IEC 60034-30-1, *Rotating electrical machines – Part 30-1: Efficiency classes of line operated AC motors (IE code)*