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# INTERNATIONAL STANDARD

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

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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# Rotating electrical machines - Part 14: Mechanical vibration of certain machines with shaft heights 56 mm and higher - Measurement, evaluation and limits of vibration severity

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IEC 60034-14 has been prepared by IEC technical committee 2: Rotating machinery. It is an International Standard.

This fifth edition cancels and replaces the fourth edition published in 2018. This edition constitutes a technical revision.

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

a) subclause 6.3.3 Vertical machines: added two new subclauses: Type and routine tests;
b) subclause 7.3 Test conditions: added two new subclauses: Direct-on-line and variable speed;
c) Table 1: decreased limits for Grade A in free suspension for $56 \leq H \leq 132$ mm;

d) Clause 9 Limits of relative shaft vibration: added information how to mitigate effects of run-out on shaft vibration measurements.

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

| Draft | Report on voting |
|---|---|
| 2/2323/FDIS | 2/2329/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/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.

NOTE A table of cross-references of all IEC TC 2 publications can be found in 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 webstore.iec.ch in the data related to the specific document. At this date, the document will be

– reconfirmed,
– withdrawn, or
– revised.

## 1 Scope

This part of IEC 60034 specifies the factory acceptance vibration test procedures and vibration limits for certain electrical machines under specified conditions, when uncoupled from any load or prime mover.

It is applicable to DC and three-phase AC machines, with shaft heights 56 mm and higher and a rated output up to 50 MW, at operational speeds from 120 $min^{-1}$ up to and including 15 000 $min^{-1}$.

This document is not applicable to machines mounted in situ (on site), three-phase commutator motors, single-phase machines, three-phase machines operated on single-phase systems, vertical waterpower generators, turbine generators greater than 20 MW and machines with magnetic bearings or series-wound machines.

NOTE 1 For machines measured in situ, refer to applicable clauses or subclauses of ISO 20816-1 and ISO 20816-3.

NOTE 2 For output power above 50 MW reference is made to the ISO 20816 series.

NOTE 3 Vibration routine tests are not mandatory according to IEC 60034-1. If performed, the method for testing is included in this document.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all 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, *Rotating electrical machines - Part 1: Rating and performance*

ISO 2954, *Mechanical vibration of rotating and reciprocating machinery - Requirements for instruments for measuring vibration severity*

ISO 10817-1, *Rotating shaft vibration measuring systems - Part 1: Relative and absolute sensing of radial vibration*

ISO 20816-1, *Mechanical vibration - Measurement and evaluation of machine vibration - Part 1: General guidelines*

ISO 21940-32, *Mechanical vibration - Rotor balancing - Part 32: Shaft and fitment key convention*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60034-1 apply.

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

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