IEC TS 60034-25

Edition 3.0 2014-10

TECHNICAL SPECIFICATION

SPECIFICATION TECHNIQUE

colour inside

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

Machines électriques tournantes – Partie 25: Machines électriques à courant alternatif utilisées dans les entraînements électriques de puissance – Guide d'application

IEC TS 60034-25:2014-10(en-fr)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FOREWORD

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Technical specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC 60034-25, which is a technical specification, has been prepared by IEC technical committee 2: Rotating machinery.

This third edition of IEC TS 60034-25 cancels and replaces the second edition of IEC TS 60034-25, published in 2007, and the fourth edition of IEC TS 60034-17, published in 2006. It constitutes a technical revision.

The main technical changes with regard to the previous editions of IEC TS 60034-25 and IEC TS 60034-17 are as follows:

a) merging of IEC TS 60034-17 into IEC TS 60034-25 adding Clause 18 which now includes all specific requirements for standard non-definite purpose electric machines. General information and knowledge have been combined with the other Clauses of IEC TS 60034-25;
b) replacement of “U Converter” with “voltage source converter”;
c) replacement of “I Converter” with “current source converter”;
d) redrafting of Clause 7;
e) addition of Subclause 9.2.6;
f) removal of Annex C: Noise increments due to converter supply.

The text of this technical specification is based on the following documents:

Enquiry draft	Report on voting
2/1731/DTS	2/1750/RVC

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

This publication 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 publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- transformed into an International standard,
- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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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 technical specification 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 technical specification 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 technical specification is to explain, as far as possible, the influence of these components on the design of the electrical machine and its performance characteristics.

This technical specification deals with both a.c. 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 a.c. 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 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 technical specification.

For electrical machines operating in potentially explosive atmospheres, additional requirements as described in the IEC 60079 series or IEC 61241 series for dust ignition proof apply.

This technical specification is not primarily concerned with safety. However, some of its recommendations may have implications for safety, which should be considered as necessary.

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

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60034-1:2010, *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 60034-9:2003, *Rotating electrical machines – Part 9: Noise limits*
Amendment 1:2007

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

IEC 60034-14:2003, *Rotating electrical machines – Part 14: Mechanical vibration of certain machines with shaft heights 56 mm and higher – Measurement, evaluation and limits of vibration severity*
Amendment 1:2007

IEC TS 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 TS 60034-18-42, *Rotating electrical machines – Part 18-42: Qualification and acceptance tests for partial discharge resistant electrical insulation systems (Type II) used in rotating electrical machines fed from voltage converters*

IEC 60050 (all parts): *International Electrotechnical Vocabulary* (available at http://www.electropedia.org)

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 61800-2:1998, *Adjustable speed electrical power drive systems – Part 2: General requirements – Rating specifications for low voltage adjustable frequency a.c. power drive systems*

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 62578:2009, *Power electronics systems and equipment – Operation conditions and characteristics of active infeed converter applications*

3 Terms and definitions

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

3.1
bearing voltage ratio
BVR
ratio of the capacitively coupled bearing voltage to the common-mode voltage

3.2
bonding
electrical connection of metallic parts of an installation together and to ground (earth)

Note 1 to entry: For the purposes of this part of IEC 60034, this definition combines elements of IEC 60050-195:1998, 195-01-10 (equipotential bonding) and 195-01-16 (functional equipotential bonding).

3.3
common-mode voltage (current)
arithmetic mean of the phase voltages (currents) to earth