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Rotating electrical machines –

Part 25:
Guide for the design and performance of cage induction motors specifically designed for converter supply

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ROTATING ELECTRICAL MACHINES –

Part 25: Guide for the design and performance of cage induction motors specifically designed for converter supply

FOREWORD

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- the required support cannot be obtained for the publication of an International Standard, despite repeated efforts, or
- The subject is still under technical development or where, for any other reason, there is the future but no immediate possibility of an agreement on an International Standard.

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

<table>
<thead>
<tr>
<th>Enquiry draft</th>
<th>Report on voting</th>
</tr>
</thead>
<tbody>
<tr>
<td>2/1271/DTR</td>
<td>2/1288/RVC</td>
</tr>
</tbody>
</table>

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.

The committee has decided that the contents of this publication will remain unchanged until 2007. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

A bilingual edition of this Technical Specification may be issued at a later date.
INTRODUCTION

This introduction is intended to explain the aim of this part of IEC 60034.

Motor categories

There are 2 categories of cage induction motors, which can be applied in variable speed electric drive systems.

- Standard cage induction motors, designed for general purpose application. The design and performance of these motors are optimized for operation on a fixed-frequency sinusoidal supply. Nevertheless they are generally also appropriate for use in variable speed drive systems.

  Guidance on this field of application is given in IEC 60034-17.

- Cage induction motors specifically designed for converter operation. The design and construction of such motors may be based on standard motors with standardized frame sizes and dimensions, but with modifications for converter operation.

  This category is covered by this part of IEC 60034, and it is recommended that the motor be marked with a reference to this part of IEC 60034.

Motors for converter supplies greater than 1 000 V, or for converters other than voltage source, will be considered in later editions of this part of IEC 60034.

Incorporation of the motor into the power drive system

Figure 1 illustrates the Power Drive System (PDS). A PDS consists of a motor and a Complete Drive Module (CDM). It does not include the equipment driven by the motor. The CDM consists of a Basic Drive Module (BDM) and its possible extensions such as the feeding section or some auxiliaries (for example ventilation). The BDM contains converter, control and self-protection functions. The rating and performance of the complete PDS is covered in general by IEC 61800-2.

NOTE Figure 1 of IEC 61800-2 provides further details of the structure of a PDS.

The motor itself and additional specific requirements for its proper incorporation into the PDS are covered by the IEC 60034 series.

![Figure 1 – Component parts of a PDS](image-url)
1 Scope

This part of IEC 60034 describes the design features and performance characteristics of polyphase cage induction motors specifically designed for use on voltage source converter supplies up to 1 000 V. It also specifies the interface parameters and interactions between the motor and the converter including installation guidance as part of a power drive system.

NOTE 1 For motors operating in potentially explosive atmospheres, additional requirements as described in the IEC 60079 series apply.

NOTE 2 This technical report is not primarily concerned with safety. However, some of its recommendations may have implications for safety, which should be considered as necessary.

NOTE 3 Where a converter manufacturer provides specific installation recommendations, they should take precedence over the recommendations of this technical report.

2 Normative references

The following referenced documents are indispensable for the application 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

IEC 60034-2:1972, Rotating electrical machines – Part 2: Methods for determining losses and efficiency of rotating electrical machinery from tests (excluding machines for traction vehicles)
Amendment 1 (1995)
Amendment 2 (1996)

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

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

IEC 60034-14, 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 60034-17, Rotating electrical machines – Part 17: Cage induction motors when fed from converters – Application guide

IEC 61800-2, 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 product standard including specific test methods

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