NSAI Standards

Standard Recommendation
S.R. CLC/TS 60034-18-42:2011

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/TS 60034-18 -42:2008 (EQV))

S.R. CLC/TS 60034-18-42:2011

Incorporating amendments/corrigenda issued since publication:

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NSAI
1 Swift Square,
Northwood, Santry
Dublin 9

T +353 1 807 3800
F +353 1 807 3838
E standards@nsai.ie
W **NSAI.ie**

Sales:
T +353 1 857 6730
F +353 1 857 6729
W standards.ie

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S.R. CLC/TS 60034-18-42:2011

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CLC/TS 60034-18-42

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English version

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/TS 60034-18-42:2008)

Machines électriques tournantes - Partie 18-42: Essais de qualification et d'acceptation des systèmes d'isolation électrique résistants aux décharges partielles (Type II) utilisés dans des machines électriques tournantes alimentées par convertisseurs de tension (CEI/TS 60034-18-42:2008)

Drehende elektrische Maschinen - Teil 18-42: Qualifizierungs- und Abnahmeprüfungen teilentladungsresistenter Isoliersysteme (Typ II) von drehenden elektrischen Maschinen, die von Spannungsumrichtern gespeist werden (IEC/TS 60034-18-42:2008)

This Technical Specification was approved by CENELEC on 2011-01-25.

CENELEC members are required to announce the existence of this TS in the same way as for an EN and to make the TS available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Ref. No. CLC/TS 60034-18-42:2011 E

Foreword

The text of the Technical Specification IEC/TS 60034-18-42:2008, prepared by IEC TC 2, Rotating machinery, was submitted to the formal vote and was approved by CENELEC as CLC/TS 60034-18-42 on 2011-01-25.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN and CENELEC shall not be held responsible for identifying any or all such patent rights.

The following date was fixed:

– latest date by which the existence of the CLC/TS has to be announced at national level (doa) 2011-07-25

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the Technical Specification IEC/TS 60034-18-42:2008 was approved by CENELEC as a Technical Specification without any modification.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 60034-18-1	-	Rotating electrical machines - Part 18-1: Functional evaluation of insulation systems - General guidelines	EN 60034-18-1	-
IEC 60034-18-32	-	Rotating electrical machines - Part 18-32: Functional evaluation of insulation systems - Test procedures for form-wound windings - Evaluation of electrical endurance	EN 60034-18-32	-
IEC/TS 60034-18-41	-	Rotating electrical machines - Part 18-41: Qualification and type tests for Type I electrical insulation systems used in rotating electrical machines fed from voltage converters	-	-
IEC 60216-3	-	Electrical insulating materials - Thermal endurance properties - Part 3: Instructions for calculating thermal endurance characteristics	EN 60216-3	-
IEC/TS 61251	-	Electrical insulating materials - A.C. voltage endurance evaluation - Introduction	-	-
IEC 61800-4	-	Adjustable speed electrical power drive systems - Part 4: General requirements - Rating specifications for a.c. power drive systems above 1 000 V a.c. and not exceeding 35 kV	EN 61800-4	-
IEC 62068-1	-	Electrical insulation systems - Electrical stresses produced by repetitive impulses - Part 1: General method of evaluation of electrical endurance	EN 62068-1	-
IEC 62539	-	Guide for the statistical analysis of electrical insulation breakdown data	-	-

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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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

FOREWORD

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- 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 60034-18-42, 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:

Enquiry draft	Report on voting
2/1482/DTS	2/1502/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.

A list of all parts of IEC 60034 series, under the general title *Rotating electrical machines*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result 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.

INTRODUCTION

The approval of electrical insulation systems for use in rotating electrical machines driven from voltage converters is set out in two Technical Specifications. They separate the systems into those which are **not** expected to experience partial discharge activity within specified conditions in their service lives (Type I) and those which **are** expected to withstand partial discharge activity in any part of the insulation system throughout their service lives (Type II). For both Type I and Type II insulation systems, the drive system integrator should inform the machine manufacturer what voltage will appear at the machine terminals in service. The machine manufacturer will then decide upon the severity of the tests appropriate for qualifying the insulation system. The severity is based on the impulse rise time, the peak to peak voltage and, in the case of Type II systems, the impulse repetition rate.

IEC/TS 60034-18-41

Type I insulation systems are dealt with in IEC/TS 60034-18-41. They are generally used in rotating machines rated at less than 700 V r.m.s. and tend to have random wound stators. In this Technical Specification, the necessary normative references and definitions are given together with a review of the effects arising from converter operation. Having established the technical foundation for the evaluation procedure, the conceptual approach is then described.

IEC/TS 60034-18-42

In this Technical Specification, the tests for qualification and acceptance of electrical insulation systems chosen for Type II rotating electrical machines are described. These insulation systems are generally used in rotating machines and tend to have form-wound coils, mostly rated above 700 V r.m.s. The qualification procedure is completely different from that used for Type I insulation systems and involves destructive ageing of insulated test objects under accelerated conditions. The manufacturer requires a life curve for the insulation system that can be interpreted to provide an estimate of life under the service conditions with converter drive. Great importance is attached to the qualification of any stress grading system that is used and testing here should be performed under repetitive impulse conditions. If the insulation system can be shown to provide an acceptable life under the appropriate ageing conditions, it is qualified for use. Acceptance testing is performed on coils made using this insulation system when subjected to a voltage endurance test.

This Technical Specification should be read in conjunction with IEC/TS 60034-18-41, which provides a background to the technology of converter drive/machine systems.

The winding insulation systems intended for converter-fed machines and converter technologies are evolving rapidly. In addition, there is on-going research into the best ways to test such insulation systems. It is expected therefore that there will be improvements in these Technical Specifications over the next few years.