SLOVENSKI STANDARD
SIST EN 60034-18-41:2014

01-oktober-2014

Električni rotacijski stroji - 18-41. del: Kvalificiranje in preskusi pri obvladovanju kakovosti električnih izolacijskih sistemov brez delne razelektritve (tip I) v električnih rotacijskih strojih, ki jih napajajo napetostni pretvorniki (IEC 60034-18-41:2014)

Rotating electrical machines - Part 18-41: Qualification and quality control tests for partial discharge free (Type I) electrical insulation systems used in rotating electrical machines fed from voltage converters (IEC 60034-18-41:2014)

Drehende elektrische Maschinen - Teil 18-41: Qualifizierung und Qualitätsprüfungen für teilentladungsfreie elektrische Isoliersysteme (Typ I) in drehenden elektrischen Maschinen, die von Spannungsumrichtern gespeist werden (IEC 60034-18-41:2014)

Machines électriques tournantes - Partie 18-41: Qualification et essais de contrôle qualité pour des systèmes d'isolation électrique sans décharge partielle (Type I) utilisés dans des machines électriques tournantes alimentées par des convertisseurs de tension (CIE 60034-18-41:2014)

Ta slovenski standard je istoveten z: **EN 60034-18-41:2014**

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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 60034-18-41:2014)

Machines électriques tournantes - Partie 18-41: Systèmes d'isolation électrique sans décharge partielle (Type I) utilisés dans des machines électriques tournantes alimentées par des convertisseurs de tension - Essais de qualification et de contrôle qualité (CEI 60034-18-41:2014)

Drehende elektrische Maschinen - Teil 18-41: Qualifizierung und Qualitätsprüfungen für teilentladungsfreie elektrische Isoliersysteme (Typ I) in drehenden elektrischen Maschinen, die von Spannungsumrichtern gespeist werden (IEC 60034-18-41:2014)

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Foreword

The text of document 2/1728/FDIS, future edition 1 of IEC 60034-18-41, prepared by IEC/TC 2 "Rotating machinery" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60034-18-41:2014.

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)	2015-01-10
–	latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2017-04-10

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Endorsement notice

The text of the International Standard IEC 60034-18-41:2014 was approved by CENELEC as a European Standard without any modification.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

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	2010	Rotating electrical machines Part 18-1: Functional evaluation of insulation systems - General guidelines	EN 60034-18-1	2010
IEC 60034-18-21	-	Rotating electrical machines Part 18-21: Functional evaluation of insulation systems - Test procedures for wire-wound windings - Thermal evaluation and classification	EN 60034-18-21	-
IEC 60034-18-31	-	Rotating electrical machines Part 18-31: Functional evaluation of insulation systems - Test procedures for form-wound windings - Thermal evaluation and classification of insulation systems used in rotating machines	EN 60034-18-31	-
IEC 60172	-	Test procedure for the determination of the temperature index of enamelled winding wires	EN 60172	-
IEC 60664-1	-	Insulation coordination for equipment within low-voltage systems Part 1: Principles, requirements and tests	EN 60664-1	-
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	CLC/TS 60034-18-42	-
IEC/TS 60034-25	2007	Rotating electrical machines Part 25: Guidance for the design and performance of a.c. motors specifically designed for converter supply	CLC/TS 60034-25	2008

IEC/TS 60034-27	-	Rotating electrical machines Part 27: Off-line partial discharge measurements on the stator winding insulation of rotating electrical machines	CLC/TS 60034-27	-
IEC/TS 61800-8	-	Adjustable speed electrical power drive systems Part 8: Specification of voltage on the power interface	-	-
IEC/TS 61934	-	Electrical insulating materials and systems - Electrical measurement of partial discharges (PD) under short rise time and repetitive voltage impulses	-	-

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INTERNATIONAL STANDARD

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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

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CONTENTS

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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

FOREWORD

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International Standard IEC 60034-18-41 has been prepared by IEC technical committee 2: Rotating machinery.

IEC 60034-18-41 cancels and replaces IEC/TS 60034-18-41 (2006).

The text of this standard is based on the following documents:

FDIS	Report on voting
2/1728/FDIS	2/1738/RVD

Full information on the voting for the approval of this standard 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 in 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

- 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 IEC documents. They divide 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 (the person responsible for co-ordinating the electrical performance of the entire drive system) shall 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. After installation of the converter/machine system, it is recommended that the drive system integrator measures the phase/phase and phase/ground voltages between the machine terminals and ground to check for compliance.

IEC 60034-18-41

The Type I systems are dealt with in this standard. They are generally used in rotating machines rated at 700 V r.m.s. or less and tend to have random wound windings. The procedures described here are directed at:

– Qualification of the insulation system.
– Type and routine testing of the complete windings of service machines.

Before undertaking any testing, the machine manufacturer shall decide upon the level of severity that the system will be required to withstand. The severity is based on how large the voltage overshoot and how short the impulse rise time will be at the machine terminals. The machine designer then makes a choice from a table in which the range of expected overshoot voltage is divided into bands. Testing is performed at the extreme value of each band. A default value of 0,3 μs is attributed to the impulse rise time. Other values of impulse rise time or voltage overshoot are dealt with as special cases.

In qualification testing, the insulation system is used to construct various representative test objects. These are subjected to the range of tests described in IEC 60034-18-21 or IEC 60034-18-31 with the addition of a high frequency voltage test and a partial discharge test. For the latter, it may be necessary to use impulse test equipment, as described in IEC/TS 61934. If the test object is partial discharge free under the specified test conditions at the end of the sequence of testing, the insulation system is qualified for the severity band that has been selected.

Type and optional routine tests are performed on complete windings to demonstrate that they are partial discharge free under sinewave or impulse voltage conditions (as appropriate) for the band of severity that the manufacturer has chosen. An impulse voltage insulation class is then assigned to the machine. A mechanism is described for dealing with special cases.

IEC/TS 60034-18-42

The tests for qualification and acceptance of electrical insulation systems chosen for Type II rotating electrical machines are described in this technical specification. 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 rotating machine 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