Rotating electrical machines -- Part 15: Impulse voltage withstand levels of form-wound stator coils for rotating a.c. Machines

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 60034-15:2009 sisaldab Euroopa standardi EN 60034-15:2009 ingliskeelset teksti.	This Estonian standard EVS-EN 60034-15:2009 consists of the English text of the European standard EN 60034-15:2009.
Standard on kinnitatud Eesti Standardikeskuse 31.07.2009 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.	This standard is ratified with the order of Estonian Centre for Standardisation dated 31.07.2009 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.
Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 17.09.2009.	Date of Availability of the European standard text 17.09.2009.
Standard on kättesaadav Eesti standardiorganisatsioonist.	The standard is available from Estonian standardisation organisation.

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Võtmesõnad: el, electric equipment, electrical testing, high-voltage tests, impulse voltages, impulse-voltage tests, pulse voltage, rated voltages, rotating, rotating electric, rotating electric machines, spools, stands, stators, testing, testing voltages, voltage fluctuations

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60034-15

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English version

Rotating electrical machines - Part 15: Impulse voltage withstand levels of form-wound stator coils for rotating a.c. machines

(IEC 60034-15:2009)

Machines électriques tournantes - Partie 15: Niveaux de tenue au choc électrique des bobines de stator préformées des machines tournantes à courant alternatif (CEI 60034-15:2009)

Drehende elektrische Maschinen - Teil 15: Steh-Stoßspannungspegel von Formspulen im Ständer drehender Wechselstrommaschinen (IEC 60034-15:2009)

This European Standard was approved by CENELEC on 2009-05-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, 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

Central Secretariat: Avenue Marnix 17, B - 1000 Brussels

Ref. No. EN 60034-15:2009 E

Foreword

The text of document 2/1534/FDIS, future edition 3 of IEC 60034-15, prepared by IEC TC 2, Rotating machinery, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60034-15 on 2009-05-01.

This European Standard supersedes EN 60034-15:1996.

The principal technical changes are as follows:

– change of title to clarify that it is form-wound coils that are being tested rather than machines;

– removal of the limitation on voltage in the scope;

– additional definitions for consistency with EN 60060-1;

– reduction in tolerances for the risetime of the steep-fronted impulse voltage;

– guidance on test levels for coils to be used in converter driven machines;

– guidance on voltage levels for routine tests;

– additional figures to show testing details and oscillograms of normal and faulty coils.

The following dates were fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2010-02-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2012-05-01

Endorsement notice

The text of the International Standard IEC 60034-15:2009 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60034-1	NOTE	Harmonized as EN 60034-1:2004 (not modified).
IEC 60060-1	NOTE	Harmonized as EN 60060-1:200X[1)] (not modified).
IEC 60071-1	NOTE	Harmonized as EN 60071-1:2006 (not modified).

[1)] At draft stage.

CONTENTS

INTRODUCTION

IEC 60071-1 specifies general requirements for the phase to earth insulation of equipment in three phase a.c. systems and states that each apparatus committee is responsible for specifying the insulation levels and test procedures for its equipment, taking into consideration the recommendations of IEC 60071-1. The object of IEC 60034-15 is to specify requirements for rotating electrical machines. Experience has shown that the values given in this standard meet the insulation requirements for the essential stresses in service. An explanation of the principles adopted in preparing these requirements is given in Annex A. This standard is not intended for soft-start machines.

ROTATING ELECTRICAL MACHINES –

Part 15: Impulse voltage withstand levels of form-wound stator coils for rotating a.c. machines

1 Scope

This part of IEC 60034 relates to a.c. machines incorporating form-wound stator coils. It specifies the test procedures and voltages to be applied to the main and interturn insulation of sample coils.

2 Terms and definitions

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

2.1
sample test
test carried out on coils in new condition which adequately represent the configuration of the finished item to be used in the machine for the purpose of evaluating the manufacturing procedures and processes incorporated in the insulation system

2.2
routine test
test carried out on all coils of the machine

2.3
form-wound stator coil
coil which is preformed to shape, insulated and substantially completed before insertion into the stator

2.4
front time
T_1
time for the impulse voltage to rise from 0 % to 100 % of the peak value and defined as 1,67 times the interval between the instants when the impulse is 30 % and 90 % of the peak value

2.5
time-to-half value
T_2
interval between the origin and the instant when the voltage has decreased to half the peak value

3 Impulse voltage withstand levels

Impulse voltage withstand levels for specific rated voltages shall be calculated in accordance with the formula given in Note 2 of Table 1. Table 1 gives the impulse voltage withstand levels for some common rated voltages rounded to the nearest whole number. The test levels for converter-fed machines depend upon how the rated voltage has been assigned by the manufacturer. It may be appropriate to increase the test levels by a factor to allow for the maximum overshoot which is likely to arise on the voltage at the machine terminals, as described in IEC 60034-18-42. This factor may be as high as 1,7 for a 3-level converter but lower if there are more levels.