SLOVENSKI STANDARD
SIST EN 60034-27-1:2018

01-oktober-2018

Nadomešča:
SIST-TS CLC/TS 60034-27:2011

Električni rotacijski stroji - 27-1. del: Meritve delne praznitve izolacije statorskega navitja odklopljenih električnih rotacijskih strojev (IEC 60034-27-1:2017)

Rotating electrical machines - Part 27-1: Off-line partial discharge measurements on the stator winding insulation of rotating electrical machines (IEC 60034-27-1:2017)

Drehende elektrische Maschinen - Teil 27-1: Off-line Teilentladungsmessungen an Ständerwicklungsisolierungen drehender elektrischer Maschinen (IEC 60034-27-1:2017)

Machines électriques tournantes - Partie 27-1: Mesures à l'arrêt des décharges partielles effectuées sur le système d'isolation des enroulements statoriques des machines électriques tournantes (IEC 60034-27-1:2017)

Ta slovenski standard je istoveten z: **EN IEC 60034-27-1:2018**

ICS:

29.160.01	Rotacijski stroji na splošno	Rotating machinery in general

SIST EN 60034-27-1:2018 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 60034-27-1

June 2018

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Supersedes CLC/TS 60034-27:2011

English Version

Rotating electrical machines - Part 27-1: Off-line partial discharge measurements on the stator winding insulation of rotating electrical machines (IEC 60034-27-1:2017)

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

The text of document 2/1877/FDIS, future edition 1 of IEC 60034-27-1:2017, prepared by IEC/TC 2 "Rotating machinery" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60034-27-1:2018.

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)	2018-12-29
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2021-06-29

This document supersedes CEN/TS 60034-27:2011.

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

Endorsement notice

The text of the International Standard IEC 60034-27-1:2017 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

IEC 60034-18-41	NOTE	Harmonized as EN 60034-18-41 (not modified).

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Publication	Year	Title	EN/HD	Year
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 60034-18-42	-	Rotating electrical machines - Part 18-42: Partial discharge resistant electrical insulation systems (Type II) used in rotating electrical machines fed from voltage converters - Qualification tests	EN 60034-18-42	-
IEC 60034-27-4	-	Rotating electrical machines - Part 27-4: Measurement of insulation resistance and polarization index of winding insulation of rotating electrical machines	EN IEC 60034-27-4	-
IEC 60060-1	-	High-voltage test techniques - Part 1: General definitions and test requirements	EN 60060-1	-
IEC 60060-2	-	High-voltage test techniques - Part 2: Measuring systems	EN 60060-2	-
IEC 60270	2000	High-voltage test techniques - Partial discharge measurements	EN 60270	2001
+ A1	2015		+ A1	2016
IEC/TS 60034-27-2	-	Rotating electrical machines - Part 27-2: On-line partial discharge measurements on the stator winding insulation of rotating electrical machines	-	-

IEC 60034-27-1

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Rotating electrical machines – Part 27-1: Off-line partial discharge measurements on the winding insulation

Machines électriques tournantes – Partie 27-1: Mesurages à l'arrêt des décharges partielles effectués sur le système d'isolation des enroulements

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ROTATING ELECTRICAL MACHINES –

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FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 60034-27-1 has been prepared by IEC technical committee 2: Rotating machinery.

This International Standard cancels and replaces IEC TS 60034-27 (2006). It constitutes a technical revision.

The main technical changes with regard to IEC TS 60034-27 (2006) are as follows:

- In 1st version the scope was not well defined, and open to a too wide range of measurement frequencies. That has been corrected.
- In 1st version pulse magnitude was defined in different ways. Now, 2 definitions are given, one for each method.
- In 1st version the types of PD were erroneous. Especially the definition of the most critical "slot discharges" has been improved.

- Adding one more common test arrangement to Clause 7.
- Adding Annex A.
- Adding Annex B.
- Adding Annex G.
- Moving part of the original text (valid for old fashioned instruments) to new Annex H.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
2/1877/FDIS	2/1887/RVD

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

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

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

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

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

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

For many years, the measurement of partial discharges (PD) has been employed as a means of assessing the quality of new insulation systems and the condition of aged insulation systems. It is also considered as a means of detecting localized sources of PD in used electrical winding insulation arising from operational stresses in service. Compared with other dielectric tests (e.g. the measurement of dissipation factor or insulation resistance) the differentiating character of partial discharge measurements allows PD sources within the insulation system to be detected.

In connection with the servicing and overhaul of rotating machines, the measurement and analysis of partial discharges can also provide information on:

– presence of ageing effects and potential defects in the insulating system;
– ageing processes;
– further measures and intervals between overhauls.

Although the PD testing of rotating machines has gained widespread acceptance, it has emerged from several studies that not only are there different methods of measurement in existence but also the criteria and methods of analysing and finally assessing the measured data are often different and not comparable. Consequently, there is a need to give some guidance to those users who are considering the use of PD measurements to assess the condition of their insulation systems.

Partial discharge testing of stator windings can be divided into two broad groups:

a) off-line measurements, in which the stator winding is isolated from the power system and a separate power supply is employed to energize the winding;
b) on-line measurements, in which the rotating machine is operating normally and connected to the power system (IEC 60034-27-2).

Both of these approaches have advantages and disadvantages with respect to one another. While acknowledging the extensive world-wide use of on-line methods and their proven value to industry, this international standard is confined to off-line techniques. This approach is considered necessary to render this standard sufficiently concise to be of use by non-specialists in the field of PD testing.

Limitations:

When PD measurements are performed on stator windings, several external factors will inevitably affect the result. Consequently, PD measurements are only comparable under certain conditions.

In a factory or site environment, the PD measurement results will be influenced by noise, unless provisions have been made to reduce the influence of noise. Different hardware and software methods, affecting for example measurement frequency band or noise cancellation algorithms, are used in different equipment systems to separate relevant PD signals from noise. Recalculation of the measured PD signal to an equivalent charge is an additional step that will be dependent on the measurement and the calibration equipment that has been used for normalization, as well as the method used.

Measurement conditions including temperature and moisture as well as test object set-up will further affect the PD result. In case of a stator winding, the attenuation and dispersion of the PD pulse during propagation will be dependent on the actual winding design and the origin of the pulse.