SLOVENSKI STANDARD
SIST EN 60214-1:2014

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Tap-changers - Part 1: Performance requirements and test methods

Stufenschalter -- Teil 1: Leistungsanforderungen und Prüfverfahren

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29.180 Transformatorji. Dušilke Transformers. Reactors

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English Version

Tap-changers - Part 1: Performance requirements and test methods (IEC 60214-1:2014)

Changeurs de prises - Partie 1: Prescriptions de performances et méthodes d'essai (CEI 60214-1:2014)

Stufenschalter - Teil 1: Leistungsanforderungen und Prüfverfahren (IEC 60214-1:2014)

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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

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Foreword

The text of document 14/746/CDV, future edition 2 of IEC 60214-1, prepared by IEC/TC 14 "Power transformers" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60214-1:2014.

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)	2015-03-26
–	latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2017-06-26

This document supersedes EN 60214-1:2003.

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Endorsement notice

The text of the International Standard IEC 60214-1:2014 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 60076-1:2011	NOTE	Harmonized in EN 60076-1:2011.
IEC 60076-11	NOTE	Harmonized as EN 60076-11.
IEC 60376	NOTE	Harmonized as EN 60376.
IEC 60599	NOTE	Harmonized as EN 60599.

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 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 60050	series	International Electrotechnical Vocabulary -- Electrical and electronic measurements and measuring	--	series
IEC 60060-1	-	High-voltage test techniques -- Part 1: General definitions and test requirements	EN 60060-1	-
IEC 60076-3	2013	Power transformers -- Part 3: Insulation levels, dielectric tests and external clearances in air	EN 60076-3	2013
IEC 60076-7	2005	Power transformers -- Part 7: Loading-guide for oil-immersed power transformers	-	-
IEC 60076-21	2011		-	-
IEC 60137	2008	Insulated bushings for alternating voltages above 1000 V	EN 60137	2008
IEC 60214-2	2004	Tap changers -- Part 2: Application guide	-	-
IEC 60270	-	High-voltage test techniques - Partial discharge measurements	EN 60270	-
IEC 60296	-	Fluids for electrotechnical applications - Unused mineral insulating oils for transformers and switchgear	EN 60296	-
IEC 60529	-	Degrees of protection provided by-enclosures (IP Code)	-	-

IEC 60214-1

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INTERNATIONAL STANDARD

colour inside

Tap-changers –
Part 1: Performance requirements and test methods

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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Part 1: Performance requirements and test methods

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 60214-1 has been prepared by IEC technical committee 14: Power transformers.

This second edition cancels and replaces the first edition published in 2003. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- incorporation of requirements on vacuum type on-load tap-changers,
- incorporation of requirements on gas insulated tap-changers,
- changes in the type tests to fit with the service conditions,
- reference to the newest edition of IEC 60076-3:2013.

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

CDV	Report on voting
14/746/CDV	14/767A/RVC

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.

A list of all parts in the IEC 60214 series, published under the general title *Tap-changers*, can be found 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.

A bilingual version of this publication may be issued at a later date.

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.

TAP-CHANGERS –

Part 1: Performance requirements and test methods

1 Scope

This part of IEC 60214 applies to on-load tap-changers of both resistor and reactor types, de-energized tap-changers, and their motor-drive mechanisms.

It applies mainly to tap-changers immersed in mineral insulating oil according to IEC 60296 but may also be used for tap-changers with air or gas insulation or immersed in other insulating liquids insofar as conditions are applicable.

It applies mainly to tap-changers with arcing contacts but may also be used for arcing-free on-load tap-changers (such as electronic switching) insofar as conditions are applicable.

This part of IEC 60214 applies to power and distribution transformers of all types and also to reactors.

It does not apply to transformers and reactors mounted on railway rolling stock.

2 Normative references

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.

IEC 60050 (all parts), *International Electrotechnical Vocabulary* (available at http://www.electropedia.org)

IEC 60050-421, *International Electrotechnical Vocabulary – Chapter 421: Power transformers and reactors*

IEC 60060-1, *High voltage test techniques – Part 1: General definitions and test requirements*

IEC 60076-3:2013, *Power transformers – Part 3: Insulation levels, dielectric tests and external clearances in air*

IEC 60076-7:2005, *Power transformers – Part 7: Loading guide for oil-immersed power transformers*

IEC 60076-21:2011, *Power transformers – Part 21: Standard requirements, terminology, and test code for step-voltage regulators*

IEC 60137:2008, *Insulated bushings for alternating voltages above 1 000 V*

IEC 60214-2:2004, *Tap-changers – Part 2: Application guide*

IEC 60270, *High-voltage test techniques – Partial discharge measurements*

IEC 60296, *Fluids for electrotechnical applications – Unused mineral insulating oils for transformers and switchgear*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-421 as well as the following apply.

3.1
on-load tap-changer
OLTC
device for changing the tap connections of a winding, suitable for operation while the transformer is energized or on load

Note 1 to entry: On-load tap-changers are sometimes called load tap-changers (LTC).

3.2
non-vacuum type on-load tap-changer
on-load tap-changer with contacts that break and make the load and circulating currents and where the arcing takes place in a liquid or gas, the tap-changer itself being placed in liquid or gas

Note 1 to entry: This definition does not apply to arcing-free on-load tap-changers.

3.3
vacuum type on-load tap-changer
on-load tap-changer where vacuum interrupters (VI) break and make the load and circulating currents, the tap-changer itself being placed in a different medium such as liquid or gas

3.4
tap selector
device designed to carry, but not to make or break, current, used in conjunction with a diverter switch to select tap connections

3.5
diverter switch
switching device used in conjunction with a tap selector to carry, make and break currents in circuits which have already been selected

Note 1 to entry: Diverter switches are sometimes called arcing switches.

3.6
selector switch
switching device capable of carrying, making and breaking current, combining the duties of a tap selector and a diverter switch

Note 1 to entry: Selector switches are sometimes called arcing tap switches.

Note 2 to entry: In non-vacuum type selector switches the selection of tap connections (tap selector duty) and the diversion of the through-current (diverter switch duty) are carried out by the same contacts.

Note 3 to entry: In vacuum type selector switches the selection of tap connections (tap selector duty) and the diversion of the through-current (diverter switch duty) are carried out by different contacts.