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STN	**Výkonové transformátory. Časť 3: Izolačné hladiny, skúšky elektrickej pevnosti a vonkajšie vzdušné vzdialenosti.**	**STN EN 60076-3** 35 1100

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Obsahuje: EN 60076-3:2013, IEC 60076-3:2013

Oznámením tejto normy sa od 4.9.2016 ruší
STN EN 60076-3 (35 1100) z decembra 2004

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60076-3

November 2013

ICS 29.180

Supersedes EN 60076-3:2001

English version

Power transformers - Part 3: Insulation levels, dielectric tests and external clearances in air

(IEC 60076-3:2013)

Transformateurs de puissance - Partie 3: Niveaux d'isolement, essais diélectriques et distances d'isolement dans l'air (CEI 60076-3:2013)

Leistungstransformatoren - Teil 3: Isolationspegel, Spannungsprüfungen und äußere Abstände in Luft (IEC 60076-3:2013)

CENELEC

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

Ref. No. EN 60076-3:2013 E

Foreword

The text of document 14/745/FDIS, future edition 3 of IEC 60076-3, prepared by IEC/TC 14 "Power transformers" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60076-3:2013.

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)	2014-06-04
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2016-09-04

This document supersedes EN 60076-3:2001.

EN 60076-3:2013 includes the following significant technical changes with respect to EN 60073-3:2001:

– Three categories of transformer are clearly identified together with the relevant test requirements, these are summarised in Table 1.
– Switching impulse levels are defined for all U_m>72,5kV.
– The procedure for Induced voltage tests with PD has been revised to ensure adequate phase to phase test voltages.
– The AC withstand test has been redefined (LTAC instead of ACSD).
– Induced voltage tests are now based on U_r rather than U_m.
– New requirements for impulse waveshape (k factor) have been introduced.
– Tables of test levels have been merged and aligned with IEC 60071-1:2010.
– Additional test levels have been introduced for U_m > 800kV.
– A new Annex E has been introduced, which sets out the principles used in assigning the tests, test levels and clearances in air.

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

Endorsement notice

The text of the International Standard IEC 60076-3:2013 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 60071-2	NOTE	Harmonized as EN 60071-2.
IEC 60076-4	NOTE	Harmonized as EN 60076-4.
IEC 60214-1	NOTE	Harmonized as EN 60214-1.
IEC 61083-1	NOTE	Harmonized as EN 61083-1.
IEC 61083-2	NOTE	Harmonized as EN 61083-2.
IEC 62271-1	NOTE	Harmonized as EN 62271-1.

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 60050-421		International electrotechnical vocabulary (IEV) - Chapter 421: Power transformers and reactors	-	-
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 60071-1		Insulation co-ordination - Part 1: Definitions, principles and rules	EN 60071-1	
IEC 60076-1		Power transformers - Part 1: General	EN 60076-1	
IEC 60137		Insulated bushings for alternating voltages above 1 000 V	EN 60137	
IEC 60270		High-voltage test techniques - Partial discharge measurements	EN 60270	

IEC 60076-3

Edition 3.0 2013-07

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Power transformers –
Part 3: Insulation levels, dielectric tests and external clearances in air

Transformateurs de puissance –
Partie 3: Niveaux d'isolement, essais diélectriques et distances d'isolement dans l'air

IEC 60076-3:2013

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

POWER TRANSFORMERS –

Part 3: Insulation levels, dielectric tests and external clearances in air

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 60076-3 has been prepared by IEC technical committee 14: Power transformers.

This third edition of IEC 60076-3 cancels and replaces the second edition published in 2000, and constitutes a technical revision. The main changes from the previous edition are as follows:

– Three categories of transformer are clearly identified together with the relevant test requirements, these are summarised in Table 1.
– Switching impulse levels are defined for all $U_m > 72{,}5$kV.
– The procedure for Induced voltage tests with PD has been revised to ensure adequate phase to phase test voltages.
– The AC withstand test has been redefined (LTAC instead of ACSD).
– Induced voltage tests are now based on U_r rather than U_m.
– New requirements for impulse waveshape (k factor) have been introduced.

– Tables of test levels have been merged and aligned with IEC 60071-1:2010.
– Additional test levels have been introduced for $U_m > 800$kV.
– A new Annex E has been introduced, which sets out the principles used in assigning the tests, test levels and clearances in air.

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

FDIS	Report on voting
14/745/FDIS	14/749/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.

A list of all the parts in the IEC 60076 series, under the general title *Power transformers*, 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.

INTRODUCTION

This part of IEC 60076 specifies the insulation requirements and the corresponding insulation tests with reference to specific windings and their terminals. It also recommends external clearances in air (Clause 16).

The insulation levels and dielectric tests which are specified in this standard apply to the internal insulation only. Whilst it is reasonable that the rated withstand voltage values which are specified for the internal insulation of the transformer should also be taken as a reference for its external insulation, this may not be true in all cases. A failure of the non-self-restoring internal insulation is catastrophic and normally leads to the transformer being out of service for a long period, while an external flashover may involve only a short interruption of service without causing lasting damage. Therefore, it may be that, for increased safety, higher test voltages are specified by the purchaser for the internal insulation of the transformer than for the external insulation of other components in the system. When such a distinction is made, the external clearances should be adjusted to fully cover the internal insulation test requirements.

Annex E sets out some of the principles used in assigning the tests, test levels and clearances in air to the transformer according to the highest voltage for equipment U_m.

POWER TRANSFORMERS –

Part 3: Insulation levels, dielectric tests and external clearances in air

1 Scope

This International Standard applies to power transformers as defined by and in the scope of IEC 60076-1. It gives details of the applicable dielectric tests and minimum dielectric test levels. Recommended minimum external clearances in air between live parts and between live parts and earth are given for use when these clearances are not specified by the purchaser.

For categories of power transformers and reactors which have their own IEC standards, this standard is applicable only to the extent in which it is specifically called up by cross reference in the other standards.

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 60050-421, *International Electrotechnical Vocabulary (IEV) – Chapter 421: Power transformers and reactors*

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

IEC 60060-2, *High-voltage test techniques – Part 2: Measuring systems*

IEC 60071-1, *Insulation co-ordination – Part 1: Definitions, principles and rules*

IEC 60076-1, *Power transformers – Part 1: General*

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

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