



SLOVENSKI STANDARD

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SIST EN 61180-1:1998

SIST EN 61180-2:1998

Tehnike visokonapetostnega preskušanja nizkonapetostne opreme - Definicije, preskusne in postopkovne zahteve, preskusna oprema

High-voltage test techniques for low voltage equipment - Definitions, test and procedure requirements, test equipment

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ICS:

19.080

Električno in elektronsko
preskušanje

Electrical and electronic
testing

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 61180

October 2016

ICS 19.080

Supersedes EN 61180-1:1994, EN 61180-2:1994

English Version

**High-voltage test techniques for low-voltage equipment -
Definitions, test and procedure requirements, test equipment
(IEC 61180:2016)**

Techniques des essais à haute tension pour matériel à
basse tension - Définitions, exigences et modalités relatives
aux essais, matériel d'essai
(IEC 61180:2016)

Hochspannungs-Prüftechnik für Niederspannungsgeräte -
Begriffe, Prüfung und Prüfbedingungen, Prüfgeräte
(IEC 61180:2016)

This European Standard was approved by CENELEC on 2016-07-29. 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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

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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

European foreword

The text of document 42/341/FDIS, future edition 1 of IEC 61180, prepared by IEC/TC 42 "High-voltage and high-current test techniques" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61180:2016.

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) 2017-04-29
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2019-07-29

This document supersedes EN 61180-1:1994 and EN 61180-2:1994.

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The text of the International Standard IEC 61180:2016 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 61000-4-5:2014	NOTE	Harmonized as EN 61000-4-5:2014 (not modified).
IEC 61010-1	NOTE	Harmonized as EN 61010-1.
IEC 61010-2-030:2010	NOTE	Harmonized as EN 61010-2-030:2010 (not modified).

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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60060-1	2010	High-voltage test techniques - Part 1: General definitions and test requirements	EN 60060-1	2010
IEC 60060-2	2010	High-voltage test techniques - Part 2: Measuring systems	EN 60060-2	2011
IEC 60068-1	2013	Environmental testing - Part 1: General and guidance	EN 60068-1	2014
IEC 60335	series	Household and similar electrical appliances - Safety	EN 60335	series
IEC 60664-1	2007	Insulation coordination for equipment within low-voltage systems - Part 1: Principles, requirements and tests	EN 60664-1	2007
IEC 61083-1	2001	Instruments and software used for measurement in high-voltage impulse tests - Part 1: Requirements for instruments	EN 61083-1	2001
IEC 61083-2	2013	Instruments and software used for measurement in high-voltage and high- current tests - Part 2: Requirements for software for tests with impulse voltages and currents	EN 61083-2	2013
ISO/IEC Guide 98-3	2008	Uncertainty of measurement - Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)	-	-

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INTERNATIONAL STANDARD

NORME INTERNATIONALE



High-voltage test techniques for low-voltage equipment – Definitions, test and procedure requirements, test equipment

Techniques des essais à haute tension pour matériel à basse tension – Définitions, exigences et modalités relatives aux essais, matériel d'essai

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

HIGH-VOLTAGE TEST TECHNIQUES FOR LOW-VOLTAGE EQUIPMENT –

Definitions, test and procedure requirements, test equipment

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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- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61180 has been prepared by IEC technical committee 42: High-voltage and high-current test techniques.

This 1st edition of IEC 61180 cancels and replaces the 1st edition of IEC 61180-1, issued in 1992, and the 1st edition of IEC 61180-2, issued in 1994.

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

FDIS	Report on voting
42/341/FDIS	42/342/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.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website 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.

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HIGH-VOLTAGE TEST TECHNIQUES FOR LOW-VOLTAGE EQUIPMENT –

Definitions, test and procedure requirements, test equipment

1 Scope

This International Standard is applicable to:

- dielectric tests with direct voltage;
- dielectric tests with alternating voltage;
- dielectric tests with impulse voltage;
- test equipment used for dielectric tests on low-voltage equipment.

This standard is applicable only to tests on equipment having a rated voltage of not more than 1 kV a.c. or 1,5 kV d.c.

This standard is applicable to type and routine tests for objects which are subjected to high voltage tests as specified by the technical committee.

The test equipment comprises a voltage generator and a measuring system. This standard covers test equipment in which the measuring system is protected against external interference and coupling by appropriate screening, for example a continuous conducting shield. Therefore, simple comparison tests are sufficient to ensure valid results.

This standard is not intended to be used for electromagnetic compatibility tests on electric or electronic equipment

NOTE Tests with the combination of impulse voltages and currents are covered by IEC 61000-4-5.

This standard provides the relevant technical committees as far as possible with:

- defined terms of both general and specific applicability;
- general requirements regarding test objects and test procedures;
- methods for generation and measurement of test voltages;
- test procedures;
- methods for the evaluation of test results and to indicate criteria for acceptance;
- requirements concerning approved measuring devices and checking methods;
- measurement uncertainty.

Alternative test procedures may be required and these should be specified by the relevant technical committees.

Care should be taken if the test object has voltage limiting devices, as they may influence the results of the test. The relevant technical committees should provide guidance for testing objects equipped with voltage limiting devices.

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 60060-1:2010, *High-voltage test techniques – Part 1: General definitions and test requirements*

IEC 60060-2:2010, *High-voltage test techniques – Part 2: Measuring systems*

IEC 60068-1:2013, *Environmental testing – Part 1: General and guidance*

IEC 60335(all parts): *Household and similar electrical appliances – Safety*

IEC 60664-1:2007, *Insulation co-ordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*

IEC 61083-1:2001, *Instruments and software used for measurement in high-voltage impulse test – Part 1: Requirements for instruments*

IEC 61083-2:2013, *Instruments and software used for measurement in high-voltage and high-current tests – Part 2: Requirements for software for tests with impulse voltages and currents*

ISO/IEC Guide 98-3:2008, *Uncertainty of measurement – Part 3: Guide to the expression of uncertainty in measurements (GUM)*

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3 Terms and definitions (standards.iteh.ai)

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

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3.1 General terms

3.1.1

clearance

distance between two conductive parts along a string stretched across the shortest path between these conductive parts

[SOURCE: IEC 60050-441:1984, 441-17-31]

3.1.2

creepage distance

shortest distance along the surface of a solid insulating material between two conductive parts

[SOURCE: IEC 60050-151: 2001, 151-15-50]

3.2 Definitions related to disruptive discharge and test voltages

3.2.1

disruptive discharge

failure of insulation under electric stress, in which the discharge completely bridges the insulation under test, reducing the voltage between electrodes to practically zero

3.2.2

withstand voltage

specified voltage value which characterizes the insulation of the object with regard to a withstand test

Note 1 to entry: Unless otherwise specified, withstand voltages are referred to standard reference atmospheric conditions (see 4.2).

3.3 Characteristics related to the test equipment

3.3.1 calibration

set of operations that establishes, by reference to standards, the relationship which exists, under specified conditions, between an indication and a result of a measurement

Note 1 to entry: The determination of the scale factor is included in the calibration.

[SOURCE: IEC 60050-311:2001, 311-01-09, modified: note modified]

3.3.2 type test

conformity test made on one or more items representative of the production

Note 1 to entry: For a measuring system, this is a test performed on a component or on a complete measuring system of the same design to characterize it under operating conditions.

[SOURCE: IEC 60050-151: 2001, 151-16-16, modified: note added]

3.3.3 routine test

conformity test made on each individual item during or after manufacture

Note 1 to entry: This is a test performed on each component or on each complete measuring system to characterize it under operating conditions.

[SOURCE: IEC 60050-151: 2001, 151-16-17, modified: note added]

3.3.4 performance test

test performed on a complete measuring system to characterize it under operating conditions

3.3.5 test equipment

complete set of devices needed to generate and measure the test voltage or current applied to a test object

3.3.6 reference measuring system

measuring system with its calibration traceable to relevant national and/or international standards, and having sufficient accuracy and stability for use in the approval of other systems by making simultaneous comparative measurements with specific types of waveform and ranges of voltage

3.3.7 assigned scale factor

scale factor of a measuring system determined at the most recent performance test

Note 1 to entry: A measuring system may have more than one assigned scale factor; for example, it may have several ranges, each with a different scale factor.

3.4 Characteristics related to direct voltage tests

3.4.1 value of the test voltage

arithmetic mean value