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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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IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

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CONTENTS

FOREWORD.....	5
1 Scope.....	7
2 Normative references.....	7
3 Terms and definitions	8
3.1 General terms	8
3.2 Definitions related to disruptive discharge and test voltages.....	8
3.3 Characteristics related to the test equipment	9
3.4 Characteristics related to direct voltage tests.....	9
3.5 Characteristics related to alternating voltage tests	10
3.6 Characteristics related to impulse tests (see Figure 1)	11
3.7 Definitions relating to tolerance and uncertainty.....	12
4 General requirements	13
4.1 General.....	13
4.2 Atmospheric conditions for test procedures and verification of test equipment	14
4.3 Procedures for qualification and use of measuring systems.....	14
4.3.1 General principles	14
4.3.2 Schedule of performance tests	15
4.3.3 Requirements for the record of performance	15
4.3.4 Uncertainty	15
4.4 Tests and test requirements for an approved measuring system and its components	16
4.4.1 Calibration – Determination of the scale factor	16
4.4.2 Influence of load	18
4.4.3 Dynamic behaviour	18
4.4.4 Short-term stability.....	19
4.4.5 Long-term stability	19
4.4.6 Ambient temperature effect	20
4.4.7 Uncertainty calculation of the scale factor.....	20
4.4.8 Uncertainty calculation of time parameter measurement (impulse voltages only)	22
5 Tests with direct voltage	25
5.1 General.....	25
5.2 Test voltage	25
5.2.1 Requirements for the test voltage	25
5.2.2 Generation of the test voltage	25
5.2.3 Measurement of the test voltage.....	25
5.3 Test procedures	26
5.3.1 Withstand voltage tests	26
6 Tests with alternating voltage.....	27
6.1 Test voltage	27
6.1.1 Requirements for the test voltage	27
6.1.2 Generation of the test voltage	27
6.1.3 Measurement of the test voltage.....	28
6.2 Test procedures	30
6.2.1 Withstand voltage tests	30
7 Tests with impulse voltage	30

7.1	Test voltage	30
7.1.1	General	30
7.1.2	Requirements for the test voltage	31
7.1.3	Generation of the test voltage	31
7.1.4	Measurement of the test voltage and determination of impulse shape.....	32
7.2	Test procedures	32
7.2.1	Verification of impulse voltage waveshape	32
7.2.2	Impulse voltage tests	32
7.3	Measurement of the test voltage	32
7.3.1	Requirements for an approved measuring system	32
7.3.2	Uncertainty contributions	33
7.3.3	Dynamic behaviour	33
7.3.4	Requirements for measuring instrument.....	33
8	Reference measurement systems	33
8.1	Requirements for reference measuring systems	33
8.1.1	Direct voltage	33
8.1.2	Alternating voltage	33
8.1.3	Impulse voltages	33
8.2	Calibration of a reference measuring system.....	33
8.2.1	General	33
8.2.2	Reference method: comparative measurement	34
8.3	Interval between successive calibrations of reference measuring systems	34
8.4	Use of reference measuring systems	34
Annex A	(informative) Uncertainty of measurement.....	35
A.1	General.....	35
A.2	Terms and definitions in addition to 3.7.....	35
A.3	Model function	36
A.4	Type A evaluation of standard uncertainty	36
A.5	Type B evaluation of standard uncertainty	37
A.6	Combined standard uncertainty	38
A.7	Expanded uncertainty.....	39
A.8	Effective degrees of freedom	40
A.9	Uncertainty budget.....	40
A.10	Statement of the measurement result	41
Annex B	(informative) Example for the calculation of measuring uncertainties in high-voltage measurements	43
Annex C	(informative) Atmospheric correction	47
C.1	Standard reference atmosphere.....	47
C.2	Atmospheric correction factor	47
C.2.1	General	47
C.2.2	Humidity correction factor k_2	47
C.2.3	Air density correction factor k_1	48
Bibliography	49
Figure 1	– Full impulse voltage time parameters	11
Figure 2	– Calibration by comparison over the full voltage range.....	17
Figure 3	– Uncertainty contributions of the calibration (example with a minimum of 5 voltage levels)	18

Figure 4 – Shaded area for acceptable normalised amplitude-frequency responses of measuring systems intended for single fundamental frequencies f_{nom} (to be tested in the range $(1 \dots 7) f_{nom}$)29

Figure 5 – Shaded area for acceptable normalised amplitude-frequency responses of measuring systems intended for a range of fundamental frequencies f_{nom1} to f_{nom2} (to be tested in the range f_{nom1} to $7 f_{nom2}$).....29

Figure 6 – 1,2/50 μ s standard impulse voltage.....31

Figure A.1 – Normal probability distribution $p(x)$42

Figure A.2 – Rectangular probability distribution $p(x)$ 42

Table 1 – Tests required for an approved direct voltage measuring system26

Table 2 – Minimum currents of the test circuit.....27

Table 3 – Tests required for an approved alternating voltage measuring system.....30

Table 4 – Tests required for an approved impulse voltage measuring system33

Table A.1 – Coverage factor k for effective degrees of freedom ν_{eff} ($p = 95,45 \%$).....40

Table A.2 – Schematic of an uncertainty budget41

Table B.1 – Result of the comparison measurement up to 500 V at a single voltage level44

Table B.2 – Summary of results for $h = 5$ voltage levels ($V_{Xmax} = 500$ V).....45

Table B.3 – Uncertainty budget of the assigned scale factor F_X46

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

HIGH-VOLTAGE TEST TECHNIQUES FOR LOW-VOLTAGE EQUIPMENT – Definitions, test and procedure requirements, test equipment

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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

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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)*

3 Terms and definitions

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

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