SLOVENSKI STANDARD
SIST HD 588.1 S1:1998

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High-voltage test techniques - Part 1: General definitions and test requirements (IEC 60060-1:1989 + corrigendum March 1990)

High-voltage test techniques -- Part 1: General definitions and test requirements

Hochspannungs-Prüftechnik -- Teil 1: Allgemeine Festlegungen und Prüfbedingungen

Techniques des essais à haute tension -- Partie 1: Définitions et prescriptions générales relatives aux essais

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ENGLISH VERSION

HIGH-VOLTAGE TEST TECHNIQUES
PART 1: GENERAL DEFINITIONS AND TEST REQUIREMENTS
(IEC 60-1:1989 + corrigendum 1990)

Techniques des essais à haute tension
Première partie: Définitions et prescriptions générales relatives aux essais
(CEI 60-1:1989 + corrigendum mars 1990)

Hochspannungs-Prüftechnik
Teil 1: Allgemeine Festlegungen und Prüfbedingungen
(IEC 60-1:1989 + Corrigendum März 1990)

This Harmonization Document was approved by CENELEC on 1991-06-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for implementation of this Harmonization Document on a national level.

Up-to-date lists and bibliographical references concerning national implementation may be obtained on application to the Central Secretariat or to any CENELEC member.

This Harmonization Document exists in three official versions (English, French, German).

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

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

Central Secretariat: rue de Stassart 35, B-1050 Brussels

FOREWORD

The CENELEC questionnaire procedure, performed for finding out whether or not the International Standard IEC 60-1:1989, as corrected by its corrigendum March 1990, could be accepted without textual changes, has shown that no CENELEC common modifications were necessary for the acceptance as Harmonization Document.
The reference document was submitted to the CENELEC members for formal vote and was approved by CENELEC as HD 588.1 S1 on 1 June 1991 (confirmed by 68 BT).

The following dates were fixed:

- latest date of announcement of the HD at national level	(doa)	1992-01-01
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ENDORSEMENT NOTICE

The text of the International Standard IEC 60-1:1989 with its corrigendum March 1990 was approved by CENELEC as a Harmonization Document without any modification.

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

High-voltage test techniques –
Part 1: General definitions and test requirements

Techniques des essais à haute tension –
Partie 1: Définitions et prescriptions générales relatives aux essais

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Première partie: Définitions et prescriptions générales relatives aux essais

IEC Publication 60-1
(Second edition - 1989)

High-voltage test techniques

Part 1: General definitions and test requirements

CORRIGENDUM

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Figure 1
Remplacer la figure existante par la nouvelle figure suivante:
Replace the existing figure by the following new figure:

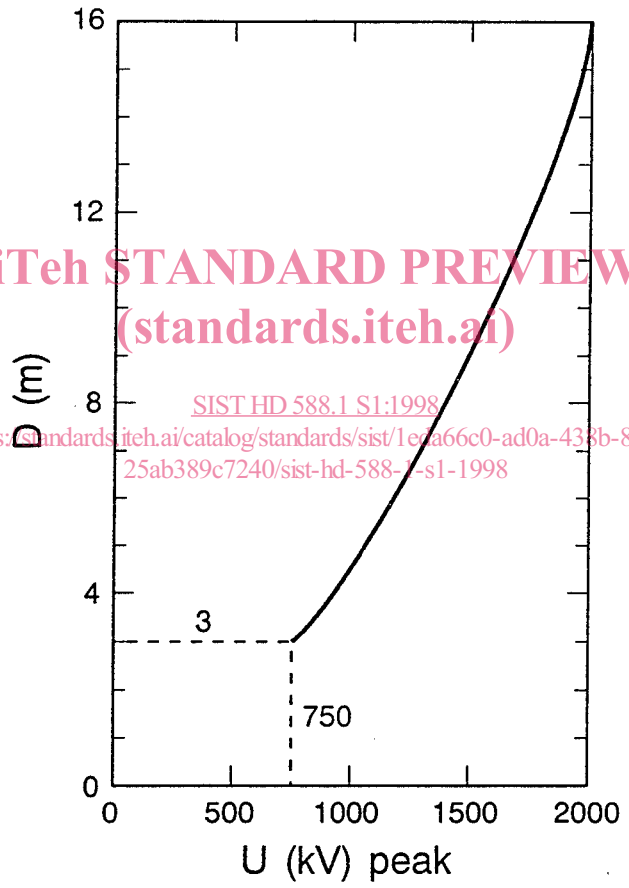

Figure 1 – Distance minimale *D* des objets sous tension ou à la terre à l'électrode sous tension d'un objet en essai, pendant un essai en tension alternative ou en tension de choc de manoeuvres positive avec tension maximale *U* appliquée pendant l'essai.

Minimum clearance *D* of extraneous live or grounded objects to the energized electrode of a test object, during an a.c. or positive switching impulse test at the maximum voltage *U* applied during test.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

HIGH VOLTAGE TEST TECHNIQUES

Part 1: General definitions and test requirements

FOREWORD

1) The formal decisions or agreements of the IEC on technical matters, prepared by Technical Committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects examined.

2) They have the form of recommendations for international use and they are accepted by the National Committees in that sense.

3) In order to promote international unification, the IEC expresses the wish that all National Committees should adopt the text of the IEC recommendation for their national rules in so far as national conditions will permit. Any divergence between the IEC recommendation and the corresponding national rules should, as far as possible, be clearly indicated in the latter.

PREFACE

This standard has been prepared by IEC Technical Committee 42: High Voltage testing techniques .

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

Six Month's Rule	Report on Voting
42(CO)40	42(CO)41

Full information on the voting for the approval of this standard can be found in the Voting Report indicated in the above table.

HIGH VOLTAGE TEST TECHNIQUES

PART 1: GENERAL DEFINITIONS AND TEST REQUIREMENTS

Section 1: General

1 Scope

This standard is applicable to:

— dielectric tests with direct voltage;

— dielectric tests with alternating voltage;

— dielectric tests with impulse voltage;

— tests with impulse current;

— tests with combinations of the above.

This standard is applicable only to tests on equipment having its highest voltage for equipment U_m above 1 kV.

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

2 Object

The object of this standard is:

— to define terms of both general and specific applicability;

— to present general requirements regarding test objects and test procedures;

— to describe methods for generation and measurement of test voltages and currents;

— to describe test procedures;

— to describe methods for the evaluation of test results and to indicate criteria for acceptance or refusal.

Definitions and requirements concerning approved measuring devices and checking methods are given in IEC Publication 60-3: High Voltage Test Techniques — Measuring Devices.

Alternative test procedures may be required to obtain reproducible and significant results. The choice of a suitable test procedure should be made by the relevant Technical Committee.

Section 2: General Definitions

3 Impulses

An impulse is an intentionally applied aperiodic transient voltage or current which usually rises rapidly to a peak value and then falls more slowly to zero.

For special purposes, impulses having approximately linearly rising fronts or transients of oscillating or approximately rectangular form are used.

The term "impulse" is to be distinguished from the term "surge" which refers to transients occurring in electrical equipment or networks in service.

3.1 *Lightning and switching impulses*

A distinction is made between lightning and switching impulses on the basis of duration of the front. Impulses with front duration up to 20 μs are defined as lightning impulses and those with longer fronts are defined as switching impulses.

Generally, switching impulses are also characterized by total durations considerably longer than those of lightning impulses.

4 Characteristics related to disruptive discharge and test voltages

4.1 *Disruptive discharge*

In this standard, the term "disruptive discharge" (sometimes referred to as "electrical breakdown") relates to phenomena associated with the failure of insulation under electrical stress, in which the discharge completely bridges the insulation under test, reducing the voltage between the electrodes practically to zero. It applies to electrical breakdown in solid, liquid and gaseous dielectrics and combinations of these.

Non-sustained disruptive discharge in which the test object is momentarily bridged by a spark or arc may occur. During these events the voltage across the test object is momentarily reduced to zero or to a very small value. Depending on the characteristics of the test circuit and the test object, a recovery of dielectric strength may occur and may even permit the test voltage to reach a higher value. Such an event should be interpreted as a disruptive discharge unless otherwise specified by the relevant Technical Committee.

Non-disruptive discharges such as those between intermediate electrodes or conductors may also occur without reduction of the test voltage to zero. Such an event should not be interpreted as a disruptive discharge unless so specified by the relevant Technical Committee.

Some non-disruptive discharges are termed "partial discharges" and are dealt with in IEC Publication 270: Partial Discharge Measurements.

The term "sparkover" is used when a disruptive discharge occurs in a gaseous or liquid medium.

The term "flashover" is used when a disruptive discharge occurs over the surface of a dielectric in a gaseous or liquid medium.

The term "puncture" is used when a disruptive discharge occurs through a solid dielectric.

A disruptive discharge in a solid dielectric produces permanent loss of dielectric strength; in a liquid or gaseous dielectric the loss may be only temporary.

4.2 *Characteristics of the test voltage*

The characteristics of a test voltage are those characteristics specified in this standard for designating the different types of voltage excursion that define the test voltage.

4.2.1 *Prospective characteristics of a test voltage*

The prospective characteristics of a test voltage causing disruptive discharge are the characteristics which would have been obtained if no disruptive discharge had occurred. When a prospective characteristic is used, this shall always be stated.

4.2.2 *Actual characteristics of a test voltage*

The actual characteristics of a test voltage are those which occur during the test at the terminals of the test object.

4.2.3 *Value of the test voltage*

The value of the test voltage is defined in the relevant Clauses of the present standard.

4.3 *Disruptive discharge voltage of a test object*

The disruptive discharge voltage of a test object is the value of the test voltage causing disruptive discharge, as specified, for the various tests, in the relevant Clauses of the present standard.

4.4 *Statistical characteristics of disruptive discharge voltages*

Disruptive discharge voltages are subject to random variations and, usually, a number of observations must be made in order to obtain a statistically significant value of the voltage. The test procedures, described in the present standard, are generally based on statistical considerations. Information on the statistical evaluation of test results is given in Appendix A.

4.4.1 *Disruptive discharge probability* p *of a test object*

The disruptive discharge probability p of a test object is the probability that one application of a certain prospective voltage value of a given shape will cause disruptive discharge in the test object. The parameter p may be expressed as a percentage or a fraction.