SLOVENSKI STANDARD
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Insulation co-ordination - Part 1: Definitions, principles and rules

Insulation co-ordination -- Part 1: Definitions, principles and rules

Isolationskoordination -- Teil 1: Begriffe, Grundsätze und Anforderungen

Coordination de l'isolement -- Partie 1: Définitions, principes et règles

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ICS:

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English version

Insulation co-ordination
Part 1: Definitions, principles and rules
(IEC 71-1:1993)

Coordination de l'isolement
Partie 1: Définitions, principes et règles
(CEI 71-1:1993)

Isolationskoordination
Teil 1: Begriffe, Grundsätze und Anforderungen
(IEC 71-1:1993)

This European Standard was approved by CENELEC on 1995-05-15. 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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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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 text of the International Standard IEC 71-1:1993, prepared by IEC TC 28, Insulation co-ordination, was submitted to the formal vote and was approved by CENELEC as EN 60071-1 on 1995-05-15 without any modification.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1996-03-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 1996-03-01

Annexes designated "normative" are part of the body of the standard.
Annexes designated "informative" are given for information only.
In this standard, annex ZA is normative and annex A is informative.
Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 71-1:1993 was approved by CENELEC as a European Standard without any modification.

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

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 38 (mod)	1983	IEC standard voltages[1)]	HD 472 S1	1989
IEC 60-1	1989	High-voltage test techniques Part 1: General definitions and test requirements	HD 588.1 S1	1991

1) The title of HD 472 S1 ist: Nominal voltages for low voltage public electricity supply systems.

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Coordination de l'isolement

Partie 1:
Définitions, principes et règles

Insulation co-ordination

Part 1:
Definitions, principles and rules

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

INSULATION CO-ORDINATION

Part 1: Definitions, principles and rules

FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international cooperation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. 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. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.

2) 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 dealt with.

3) They have the form of recommendations for international use published in the form of standards, technical reports or guides and they are accepted by the National Committees in that sense.

4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.

International Standard IEC 71-1 has been prepared by IEC technical committee 28: Insulation co-ordination.

This seventh edition cancels and replaces the sixth edition published in 1976 which dealt only with insulation co-ordination between phase and earth, and the first part of the first edition – published in 1982 – of IEC Publication 71-3 which dealt with insulation co-ordination between phases.

This standard constitutes a technical revision and forms Part 1 of IEC Publication 71.

IEC Publication 71-2 (in preparation) will constitute the Application Guide for the insulation co-ordination of electrical equipment.

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

DIS	Report on voting
28(CO)58	28(CO)60

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

Annex A is for information only.

INSULATION CO-ORDINATION

Part 1: Definitions, principles and rules

1 Scope

This part of International Standard IEC 71 applies to three-phase a.c. systems having a highest voltage for equipment above 1 kV. It specifies the procedure for the selection of the standard withstand voltages for the phase-to-earth, phase-to-phase and longitudinal insulation of the equipment and the installations of these systems. It also gives the lists of the standardized values from which the standard withstand voltages shall be selected.

This part recommends that the selected withstand voltages should be associated with the highest voltage for equipment. This association is for insulation co-ordination purposes only. The requirements for human safety are not covered by this Standard.

Although the principles of this part also apply to transmission line insulation, the values of the withstand voltages may be different from the standard withstand voltages.

The apparatus committees are responsible for specifying the withstand voltages and the test procedures suitable for the relevant equipment taking into consideration the recommendations of this Standard.

NOTE – In IEC 71-2 Application Guide, (under revision), all rules for insulation co-ordination given in this Standard are justified in detail, in particular the association of the standard withstand voltages with the highest voltage for equipment. When more than one set of standard withstand voltages is associated with the same highest voltage for equipment, guidance is provided for the selection of the most suitable set.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 71-1. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this part of IEC 71-1 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 38: 1983, *IEC standard voltages*

IEC 60-1: 1989, *High-voltage test techniques – Part 1: General definitions and test requirements*

3 Definitions

For the purposes of this International Standard, the following definitions apply.

3.1 **insulation co-ordination:** The selection of the dielectric strength of equipment in relation to the voltages which can appear on the system for which the equipment is intended and taking into account the service environment and the characteristics of the available protective devices. [IEV 604-03-08, modified]

NOTE – By "dielectric strength" of the equipment, is meant here its rated or its standard insulation level as defined in 3.32 and 3.33 respectively.

3.2 **external insulation:** The distances in atmospheric air, and the surfaces in contact with atmospheric air of solid insulation of the equipment which are subject to dielectric stresses and to the effects of atmospheric and other external conditions, such as pollution, humidity, vermin, etc. [IEV 604-03-02, modified]

NOTE – External insulation is either *weather-protected* or *non-weather-protected*, designed to operate inside or outside closed shelters respectively.

3.3 **internal insulation:** The internal solid, liquid, or gaseous parts of the insulation of equipment which are protected from the effects of atmospheric and other external conditions. [IEV 604-03-03]

3.4 **self-restoring insulation:** Insulation which completely recovers its insulating properties after a disruptive discharge. [IEV 604-03-04]

3.5 **non-self-restoring insulation:** Insulation which loses its insulating properties, or does not recover them completely, after a disruptive discharge. [IEV 604-03-05]

NOTE – The definitions of 3.4 and 3.5 apply only when the discharge is caused by the application of a test voltage during a dielectric test. However, discharges occurring in service may cause a self-restoring insulation to lose partially or completely its original insulating properties.

3.6 **insulation configuration terminal:** Any of the electrodes between any two of which a voltage that stresses the insulation can be applied. The types of terminal are:

a) **phase terminal**, between which and the neutral is applied in service the phase-to-neutral voltage of the system;

b) **neutral terminal**, representing, or connected to, the neutral point of the system (neutral terminal of transformers, etc.);

c) **earth terminal**, always solidly connected to earth in service (tank of transformers, base of disconnectors, structures of towers, ground plane, etc.).

3.7 **insulation configuration:** The complete geometric configuration of the insulation in service, consisting of the insulation and of all terminals. It includes all elements (insulating and conducting) which influence its dielectric behaviour. The following insulation configurations are identified:

– **three-phase:** having three phase terminals, one neutral terminal and one earth terminal.

– **phase-to-earth:** a three-phase insulation configuration where two phase terminals are disregarded and, except in particular cases, the neutral terminal is earthed.