SLOVENSKI STANDARD

SIST EN 60255-5:2002

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Electrical relays - Part 5: Insulation coordination for measuring relays and protection equipment - Requirements and tests

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EUROPEAN STANDARD **EN 60255-5**

NORME EUROPÉENNE

EUROPÄISCHE NORM April 2001

ICS 29.120.70

English version

Electrical relays
Part 5: Insulation coordination for measuring relays and protection equipment - Requirements and tests
(IEC 60255-5:2000)

Relais électriques
Partie 5: Coordination de l'isolement des relais de mesure et des dispositifs de protection - Prescriptions et essais
(CEI 60255-5:2000)

Elektrische Relais
Teil 5: Isolationskoordination für Meßrelais und Schutzeinrichtungen - Anforderungen und Prüfungen
(IEC 60255-5:2000)

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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.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, 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

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Ref. No. EN 60255-5:2001 E

Foreword

The text of document 95/98/FDIS, future edition 2 of IEC 60255-5, prepared by IEC TC 95, Measuring relays and protection equipment, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60255-5 on 2001-03-01.

This standard should be read in conjunction with HD 625.1 S1:1996.

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) 2001-12-01

– latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2004-03-01

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 annexes A to D are informative.
Annex ZA has been added by CENELEC.

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Endorsement notice

The text of the International Standard IEC 60255-5:2001 was approved by CENELEC as a European Standard without any modification.

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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 60050-151	1978	International Electrotechnical Vocabulary (IEV) Chapter 151: Electrical and magnetic devices	-	-
IEC 60050-448	1995	Chapter 448: Power system protection	-	-
IEC 60060-1 + corr. March	1989 1990	High-voltage test techniques Part 1: General definitions and test requirements	HD 588.1 S1	1991
IEC 60085	1984	Thermal evaluation and classification of electrical insulation	HD 566 S1	1990
IEC 60112	1979	Method for determining the comparative and the proof tracking indices of solid insulating materials under moist conditions	HD 214 S2	1980
IEC 60255	Series	Electrical relays	EN 60255	Series
IEC 60255-21-1	1988	Part 21: Vibration, shock, bump and seismic tests on measuring relays and protection equipment -- Section 1: Vibration tests (sinusoidal)	EN 60255-21-1	1995
IEC 60255-21-2	1988	Part 21: Vibration, shock, bump and seismic tests on measuring relays and protection equipment -- Section 2: Shock and bump tests	EN 60255-21-2	1995
IEC 60255-21-3	1993	Part 21: Vibration, shock, bump and seismic tests on measuring relays and protection equipment -- Section 3: Seismic tests	EN 60255-21-3	1995
IEC 60664-1 (mod)	1992	Insulation coordination for equipment within low-voltage systems Part 1: Principles, requirements and tests	HD 625.1 S1 + corr. November	1996 1996

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Publication	Year	Title	EN/HD	Year
IEC 61000-4-5	1995	Electromagnetic compatibility (EMC) Part 4-5: Testing and measurement techniques - Surge immunity test	EN 61000-4-5	1995
IEC 61180-1	1992	High-voltage test techniques for low-voltage equipment Part 1: Definitions, test and procedure requirements	EN 61180-1	1994
IEC 61180-2	1994	Part 2: Test equipment	EN 61180-2	1994

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CEI
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Deuxième édition
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2000-12

Relais électriques –

Partie 5:
Coordination de l'isolement des relais de mesure et des dispositifs de protection – Prescriptions et essais

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Part 5:
Insulation coordination for measuring relays and protection equipment – Requirements and tests

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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ELECTRICAL RELAYS –

Part 5: Insulation coordination for measuring relays and protection equipment – Requirements and tests

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 co-operation 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 express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, 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.
5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

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International Standard IEC 60255-5 has been prepared by IEC technical committee 95: Measuring relays and protection equipment.

This second edition cancels and replaces the first edition, published in 1977, and constitutes a technical revision.

This standard shall be read in conjunction with IEC 60664-1.

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

FDIS	Report on voting
95/98/FDIS	95/108/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 3.

Annexes A to D are for information only.

The committee has decided that the contents of this publication will remain unchanged until 2004. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

INTRODUCTION

The following points have been considered in the preparation of this standard.

– The application of the insulation coordination according to IEC 60664-1 leads to a graded range of rated impulse voltages dependent on the nominal voltage of the supply circuit and the applicable overvoltage category. Further, the impulse test voltages depend on the air pressure and therefore on the altitude of the test site. Consequently, a wide range of test voltages becomes necessary.

  For an effective test practice, a rationalised test voltage of 5 kV has been specified in this standard. It is applicable for the normal case of relays directly energised via current and voltage transformers or directly connected to the station battery supply. It is applicable independent of the test site altitude, from sea level to 2 000 m.

  The existing impulse test generators designed according to IEC 60060-1 remain applicable in this case.

  For other test voltages, the IEC 60060-1 generator can also be used; however components of the generator must be modified depending on the required test voltage, as described in annex C. The modifications are necessary to retain the specified output energy of 0,5 J.

  It is expected that suitable impulse test generators with variable output voltage and a fixed output energy of 0,5 J will become available on the market in the near future.

– Reduction of the source impedance of the impulse test generator to 50 Ω has been considered, because a value of this order would seem to correspond better to the characteristic impedance of the substation wiring (see also IEC 61000-4-5). However, considering the satisfactory experience with the current standard and in order to avoid the existing test generators from becoming obsolete, the 500 Ω value has been retained.

– Impulse withstand testing of circuits containing voltage suppression components may lead to heavy distortion of the impulse test waveform. This is acceptable, conditional upon the equipment being undamaged and fully functional after completion of the tests. Withstand surge testing of circuits is not part of insulation testing and not part of this standard.

– The inclusion of the pollution degree is based on IEC 60664-1 and is a new consideration.

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ELECTRICAL RELAYS –

Part 5: Insulation coordination for measuring relays and protection equipment – Requirements and tests

1 Scope and object

This part of IEC 60255 gives general requirements for the insulation coordination of measuring relays and protection equipment.

NOTE 1 Unless otherwise stated, the term “relay(s)” is used as an abbreviation for the expression “measuring relays and protection equipment” in this standard.

In particular, this standard, specifies the following:

– definition of terms;

– guidance for the selection of clearances and creepage distances and other aspects related to the insulation of measuring relays and protection equipment;

– requirements for voltage tests and insulation resistance measurement.

This standard is applicable to the installation and use at altitudes up to 2 000 m of equipment having a rated a.c. voltage up to 1 000 V, with a rated frequency up to 65 Hz, or a d.c. voltage up to 1 500 V.

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This standard also applies to associated auxiliary devices such as shunts, series resistors, transformers, etc., used and tested together with measuring relays and protection equipment as mentioned above, except where the devices are covered by other IEC publications, for example communication interfaces.

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NOTE 2 Requirements for altitudes exceeding 2 000 m can be derived from table B.1.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 60255. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of IEC 60255 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

IEC 60050(151):1978, *International Electrotechnical Vocabulary (IEV) – Chapter 151: Electrical and magnetic devices*

IEC 60050(448):1995, *International Electrotechnical Vocabulary – Chapter 448: Power system protection*

IEC 60060-1:1989, *High-voltage test techniques – Part 1: General definitions and test requirements*

IEC 60085:1984, *Thermal evaluation and classification of electrical insulation*

IEC 60112:1979, *Method for determining the comparative and the proof tracking indices of solid insulating materials under moist conditions*

IEC 60255 (all parts), *Electrical relays*

IEC 60255-21-1:1988, *Electrical relays – Part 21: Vibration, shock, bump and seismic tests on measuring relays and protection equipment – Section 1: Vibration tests (sinusoidal)*

IEC 60255-21-2:1988, *Electrical relays – Part 21: Vibration, shock, bump and seismic tests on measuring relays and protection equipment – Section 2: Shock and bump tests*

IEC 60255-21-3:1993, *Electrical relays – Part 21: Vibration, shock, bump and seismic tests on measuring relays and protection equipment – Section 3: Seismic tests*

IEC 60664-1:1992, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*

IEC 61000-4-5:1995, *Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 5: Surge immunity test*

IEC 61180-1:1992, *High-voltage test techniques for low-voltage equipment – Part 1: Definitions and test procedure requirements*

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IEC 61180-2:1994, *High-voltage test techniques for low-voltage equipment – Part 2: Test equipment*

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3 Definitions

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For the purpose of this part of IEC 60255, the following definitions together with those of IEC 60050(448), IEC 60664-1 and the relevant parts of IEC 60255 apply.

3.1
hazardous live part
part at a voltage in excess of 50 V r.m.s. or 75 V d.c.

3.2
exposed conductive part
conductive part which can be readily touched and is normally not hazardous live but may be at hazardous live voltage under a single fault condition

NOTE 1 For relays which are not enclosed, the frame, the fixing devices, etc., form the exposed conductive parts.

NOTE 2 For relays which are enclosed, the conductive parts which are accessible when the relay is mounted in its normal position of use, including those of its fixing surface, form the exposed conductive parts. Small parts such as inscription plates, screws and rivets which are isolated from the circuits are not taken into consideration.

3.3
clearance
shortest distance in air between two conductive parts
[IEC 60664-1]

3.4
solid insulation
solid insulating material interposed between any two conductive parts
[IEC 60664-1]