

SLOVENSKI STANDARD

SIST EN 61010-031:2003

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Nadomešča:

SIST EN 61010-2-031:1995

Varnostne zahteve za električno opremo za meritve, nadzorovanje in laboratorijsko uporabo - 031. del: Varnostne zahteve za ročne sonde za električne meritve in preskušanja

Safety requirements for electrical equipment for measurement, control and laboratory use -- Part 031: Safety requirements for hand-held probe assemblies for electrical measurement and test

Sicherheitsbestimmungen für elektrische Mess-, Steuer-, Regel- und Laborgeräte -- Teil 031: Sicherheitsbestimmungen für handgehaltenes Messzubehör zum Messen und Prüfen

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Règles de sécurité pour appareils électriques de mesure, de régulation et de laboratoire -- Partie 031: Prescriptions de sécurité pour sondes équipées tenues à la main pour mesure et essais électriques

Ta slovenski standard je istoveten z: EN 61010-031:2002

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19.080	Električno in elektronsko preskušanje	Electrical and electronic testing
71.040.10	Kemijski laboratoriji. Laboratorijska oprema	Chemical laboratories. Laboratory equipment

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EUROPEAN STANDARD

EN 61010-031

NORME EUROPÉENNE

EUROPÄISCHE NORM

February 2002

ICS 19.080

Supersedes EN 61010-2-031:1994

English version

**Safety requirements for electrical equipment for measurement,
control and laboratory use**
**Part 031: Safety requirements for hand-held probe assemblies
for electrical measurement and test**
(IEC 61010-031:2002)

Règles de sécurité pour appareils
électriques de mesure,
de régulation et de laboratoire
Partie 031: Prescriptions de sécurité
pour sondes équipées tenues à la main
pour mesurage et essais électriques
(CEI 61010-031:2002)

Sicherheitsbestimmungen für elektrische
Mess-, Steuer-, Regel- und Laborgeräte
Teil 031: Sicherheitsbestimmungen
für handgehaltenes Messzubehör
zum Messen und Prüfen
(IEC 61010-031:2002)

<https://standards.iteh.ai/catalog/standards/sist/541550a8-c64f-426a-92de-a5831a11ce6a/sist-en-61010-031-2003>

This European Standard was approved by CENELEC on 2002-02-01. 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.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, 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 text of document 66/262/FDIS, future edition 1 of IEC 61010-031, prepared by IEC TC 66, Safety of measuring, control, and laboratory equipment, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61010-031 on 2002-02-01.

This European Standard supersedes EN 61010-2-031:1994.

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) 2002-11-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2005-02-01

In this standard, the following print types are used:

- requirements and definitions: in roman type;
- NOTES: in smaller roman type;
- *conformity and tests: in italic type;*
- TERMS USED THROUGHOUT THIS STANDARD WHICH HAVE BEEN DEFINED IN CLAUSE 3: IN SMALL ROMAN CAPITALS.

Annexes designated "normative" are part of the body of the standard.

Annexes designated "informative" are given for information only.

In this standard, annexes A, B, C and ZA are normative and annex D is informative.

Annex ZA has been added by CENELEC.

Endorsement notice

<https://standards.iteh.ai/catalog/standards/sist/541550a8-c64f-426a-92de-a581e31b161c/iec-61010-031-2003>

The text of the International Standard IEC 61010-031:2002 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 60065	NOTE Harmonized as EN 60065:1998 (modified).
IEC 60270	NOTE Harmonized as EN 60270:2001 (not modified).
IEC 60664-1	NOTE Harmonized as HD 625.1 S1:1996 (modified).
IEC 61032	NOTE Harmonized as EN 61032:1998 (not modified).
IEC 61010 (Series)	NOTE Harmonized as EN 61010 (Series) (modified).

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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60027	Series	Letter symbols to be used in electrical technology	-	-
IEC 60060	Series	High-voltage test techniques	HD 588.1 S1 EN 60060-2	1991 1994
IEC 60417	Series	Graphical symbols for use on equipment	EN 60417	Series
IEC 60529	- ¹⁾	Degrees of protection provided by enclosures (IP Code)	EN 60529 + corr. May	1991 ²⁾ 1993
IEC 60664-3	- ¹⁾	Insulation coordination for equipment within low-voltage systems Part 3: Use of coatings to achieve insulation coordination of printed board assemblies	HD 625.3 S1	1997 ²⁾
ISO 7000	- ¹⁾	Graphical symbols for use on equipment - Index and synopsis	-	-

¹⁾ Undated reference.

²⁾ Valid edition at time of issue.

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NORME INTERNATIONALE INTERNATIONAL STANDARD

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GROUPED SAFETY PUBLICATION

Règles de sécurité pour appareils électriques de mesure, de régulation et de laboratoire –

Partie 031:
**Prescriptions de sécurité pour sondes équipées
tenues à la main pour mesure et essais
électriques**

**Safety requirements for electrical equipment
for measurement, control and laboratory use –**

Part 031:
**Safety requirements for hand-held probe
assemblies for electrical measurement and test**

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Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

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CONTENTS

FOREWORD.....	7
1 Scope and object.....	11
1.1 Scope.....	11
1.2 Object.....	11
1.3 Verification.....	13
1.4 Environmental conditions.....	13
2 Normative references.....	13
3 Definitions.....	15
3.1 Parts and accessories.....	15
3.2 Electrical quantities.....	17
3.3 Tests.....	17
3.4 Safety terms.....	17
3.5 Insulation.....	19
4 Tests.....	25
4.1 General.....	25
4.2 Sequence of tests.....	27
4.3 Reference test conditions.....	27
4.4 Testing in SINGLE FAULT CONDITION.....	29
5 Marking and documentation.....	33
5.1 Marking.....	33
5.2 Warning markings.....	37
5.3 Durability of markings.....	39
5.4 Documentation.....	39
6 Protection against electric shock.....	41
6.1 General.....	41
6.2 Determination of ACCESSIBLE parts.....	43
6.3 Permissible limits for ACCESSIBLE parts.....	47
6.4 Insulation requirements for protection against electric shock.....	53
6.5 CLEARANCES and CREEPAGE DISTANCES.....	61
6.6 Dielectric strength tests.....	73
6.7 Constructional requirements for protection against electric shock.....	79
7 Protection against mechanical HAZARDS.....	85
8 Mechanical resistance to shock and impact.....	85
8.1 Rigidity test.....	87
8.2 Drop test.....	87
8.3 Impact swing test.....	89
9 Temperature limits and protection against the spread of fire.....	89
9.1 General.....	89
9.2 Temperature tests.....	91
10 Resistance to heat.....	91
10.1 Integrity of CLEARANCES and CREEPAGE DISTANCES.....	91
10.2 Resistance to heat.....	91

11	Protection against hazards from fluids.....	93
11.1	General	93
11.2	Cleaning	93
11.3	Specially protected PROBE ASSEMBLIES	47
12	Components	93
12.1	General	93
12.2	Fuses	95
12.3	HIGH-INTEGRITY components	95
Annex A (normative)	Measuring circuits for ACCESSIBLE current (see 6.3).....	99
Annex B (normative)	Standard test fingers (see 6.2).....	107
Annex C (normative)	Measurement of CREEPAGE DISTANCES and CLEARANCES	111
Annex D (informative)	Index of defined terms	119
Bibliography	121
Figure 1	– Examples of type A and C PROBE ASSEMBLIES.....	23
Figure 2	– Examples of type B PROBE ASSEMBLIES.....	25
Figure 3	– Methods for determination of ACCESSIBLE parts (see 6.2) and for voltage tests of (see 6.4.1).....	45
Figure 4	– Example of application of metal foil for ACCESSIBLE current measurement.....	47
Figure 5	– Charged capacitance level in SINGLE FAULT CONDITION (see 6.3.2.3).....	51
Figure 6	– Protection against touching a PROBE TIP (see 6.4.4)	59
Figure 7	– Flexing test.....	83
Figure 8	– Flexing test for cable used in PROBE ASSEMBLIES (see 6.7.4).....	85
Figure 9	– Impact swing test (see 8.3).....	89
Figure A.1	– Measuring circuit for d.c. and for a.c. with frequencies up to 1 MHz.....	99
Figure A.2	– Measuring circuits for d.c. and for a.c. with sinusoidal frequencies up to 100 Hz	101
Figure A.3	– Current measuring circuit for electrical burns	103
Figure A.4	– Current measuring circuit for WET CONTACT	105
Figure B.1	– Rigid test finger	107
Figure B.2	– Jointed test finger.....	109
Table 1	– Symbols	35
Table 2	– Multiplication factors for CLEARANCE for altitudes up to 5 000 m	63
Table 3	– CLEARANCES for measurement categories II, III and IV.....	65
Table 4	– CLEARANCE values for the calculation of 6.5.2.2.....	69
Table 5	– CREEPAGE DISTANCES	71
Table 6	– Test voltages for BASIC INSULATION	77
Table 7	– Correction factors for test voltage according to test site altitude	79
Table 8	– Pull force for cable attachment.....	83
Table C.1	– Relation between POLLUTION degrees and width of grooves	111

INTERNATIONAL ELECTROTECHNICAL COMMISSION

SAFETY REQUIREMENTS FOR ELECTRICAL EQUIPMENT FOR MEASUREMENT, CONTROL AND LABORATORY USE –

Part 031: Safety requirements for hand-held probe assemblies for electrical measurement and test

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.

International Standard IEC 61010-031 has been prepared by IEC technical committee 66: Safety of measuring, control and laboratory equipment.

This new edition cancels and replaces the first edition of IEC 61010-2-031 (1993).

It has the status of a group safety publication in accordance with IEC Guide 104.

IEC 61010-031 is a stand-alone standard and consequently no reference is required to IEC 61010-1, except as mentioned in the note to 1.1.

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

FDIS	Report on voting
66/262/FDIS	66/272/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, B and C form an integral part of this standard.

In this standard the following print types are used:

- requirements and definitions: in roman type;
- NOTES: in smaller roman type;
- *conformity and tests: in italic type;*
- terms used throughout this standard which have been defined in clause 3: SMALL ROMAN CAPITALS.

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.

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SAFETY REQUIREMENTS FOR ELECTRICAL EQUIPMENT FOR MEASUREMENT, CONTROL AND LABORATORY USE –

Part 031: Safety requirements for hand-held probe assemblies for electrical measurement and test

1 Scope and object

1.1 Scope

This part of IEC 61010 applies to hand-held and hand-manipulated PROBE ASSEMBLIES of the types described below, and related accessories which are intended for professional, industrial process, and educational use. These PROBE ASSEMBLIES are for use in the interface between an electrical phenomenon and test or measurement equipment. They may be fixed to the equipment or be detachable accessories for the equipment.

- a) Low-voltage and high-voltage, non-attenuating PROBE ASSEMBLIES (type A). Non-attenuating PROBE ASSEMBLIES that are RATED for direct connection to voltages exceeding 33 V r.m.s. or 46,7 V peak or 70 V d.c., but not exceeding 63 kV. They do not incorporate active components, nor are they intended to provide a voltage divider function or a signal conditioning function, but they may contain passive non-attenuating components such as fuses.
- b) High-voltage attenuating or divider PROBE ASSEMBLIES (type B). Attenuating or divider PROBE ASSEMBLIES that are RATED for direct connection to secondary voltages exceeding 1 kV but not exceeding 63 kV. The divider function may be carried out wholly within the PROBE ASSEMBLY, or partly within the test or measurement equipment to be used with the PROBE ASSEMBLY.
- c) Low-voltage attenuating or divider PROBE ASSEMBLIES (type C). Attenuating, divider or other signal conditioning PROBE ASSEMBLIES for direct connection to voltages exceeding 33 V r.m.s or 46,7 V peak or 70 V d.c., but not exceeding 1 kV r.m.s. or 1,5 kV d.c. The signal conditioning function may be carried out wholly within the PROBE ASSEMBLY, or partly within the test or measurement equipment intended to be used with the PROBE ASSEMBLY.

NOTE PROBE ASSEMBLIES which

- are not within the definitions of types A, B or C, or,
- which are designed to be powered from a low-voltage mains supply, or
- include other features not specifically addressed in this standard

may also need to meet the relevant requirements of other parts of IEC 61010 [6]¹⁾.

1.2 Object

1.2.1 Aspects included in scope

The object of this standard is to ensure that the design and methods of construction used provide adequate protection for the OPERATOR and the surrounding area against:

- a) electric shock or burn (see clauses 6, 10 and 11);
- b) mechanical HAZARDS (see clauses 7, 8 and 11);
- c) excessive temperature (see clause 9);
- d) spread of fire from the PROBE ASSEMBLY (see clause 9).

NOTE Attention is drawn to the existence of additional requirements which may be specified by national authorities responsible for health and safety of labour forces.

¹⁾ Figures in square brackets refer to the bibliography.

1.2.2 Aspects excluded from scope

This standard does not cover

- a) reliable function, performance or other properties of the PROBE ASSEMBLY;
- b) effectiveness of transport packaging;
- c) servicing (repair);
- d) protection of servicing (repair) personnel.

NOTE Servicing personnel are expected to be reasonably careful in dealing with obvious HAZARDS, but the design should protect against mishap in an appropriate manner, and the service documentation should point out any residual HAZARDS.

1.3 Verification

This standard also specifies methods of verifying, through inspection and TYPE TESTING, that the PROBE ASSEMBLY meets the requirements of this standard.

1.4 Environmental conditions

This standard applies to PROBE ASSEMBLIES designed to be safe at least under the following conditions:

- a) altitude up to 2 000 m, or above 2 000 m if specified by the manufacturer;
- b) temperature 5 °C to 40 °C; or below 5 °C or above 40 °C if specified by the manufacturer;
- c) maximum relative humidity 80 % for temperatures up to 31 °C decreasing linearly to 50 % relative humidity at 40 °C;
- d) applicable RATED POLLUTION degree.

<https://standards.iteh.ai/catalog/standards/sist/541550a8-c64f-426a-92de-a5831a11ce6a/sist-en-61010-031-2003>

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 61010. 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 61010 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 IEC and ISO maintain registers of currently valid International Standards.

IEC 60027 (all parts), *Letter symbols to be used in electrical technology*

IEC 60060 (all parts), *High-voltage test techniques*

IEC 60417 (all parts), *Graphical symbols for use on equipment*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

IEC 60664-3, *Insulation coordination for equipment within low-voltage systems – Part 3: Use of coatings to achieve insulation coordination of printed board assemblies*

ISO 7000, *Graphical symbols for use on equipment – Index and synopsis*

3 Definitions

For the purpose of this part of IEC 61010, the following definitions apply.

Unless otherwise specified, the terms "voltage" and "current" mean the r.m.s. values of an alternating, direct or composite voltage or current. Where the term "mains" is used, it refers to the low-voltage electricity supply system (above the values of 6.3.2.1).

3.1 Parts and accessories

3.1.1

TERMINAL

component provided for the connection of a device (equipment) to external conductors

[IEV 151-01-03, modified]

NOTE TERMINALS can contain one or several contacts and the term includes sockets, pins, connectors, etc.

3.1.2

ENCLOSURE

part providing protection of equipment against certain external influences and, in any direction, protection against direct contact

3.1.3

BARRIER

part providing protection against direct contact from any usual direction of access

NOTE ENCLOSURES and BARRIERS may provide protection against the spread of fire (see 9.1).

3.1.4

PROBE ASSEMBLY

device for making temporary contact between test or measurement equipment and a point on an electrical circuit being measured or tested. It includes the cable and the means for making a connection with the test or measurement equipment

NOTE See figures 1 and 2 for examples of PROBE ASSEMBLIES and an explanation of the function of their parts.

3.1.5

PROBE TIP

part of the PROBE ASSEMBLY which makes the connection to the point being measured or tested

3.1.6

REFERENCE CONNECTOR

device used to connect a reference point in the test or measurement equipment (usually the functional earth TERMINAL) to a reference point on the electrical circuit being measured or tested

3.1.7

TOOL

external device, including a key or coin, used to aid a person to perform a mechanical function

3.2 Electrical quantities

3.2.1

RATED (value)

quantity value assigned, generally by a manufacturer, for a specified operating condition of a component, device or equipment

[IEV 151-04-03]

3.2.2

RATING

set of RATED values and operating conditions

[IEV 151-04-04]

3.2.3

WORKING VOLTAGE

highest voltage which can continuously appear across an insulation during NORMAL USE

NOTE Both open-circuit conditions and normal operating conditions are taken into account.

3.3 Tests

3.3.1

TYPE TEST

test of one or more samples of equipment (or parts of equipment) made to a particular design, to show that the design and construction meet one or more requirements of this standard

NOTE This is an amplification of the IEC 151-04-15 definition to cover both design and construction requirements.

3.4 Safety terms

[SIST EN 61010-031:2003](https://standards.iteh.ai/catalog/standards/sist/541550a8-c64f-426a-92de-a5831a11ce6a/sist-en-61010-031-2003)

<https://standards.iteh.ai/catalog/standards/sist/541550a8-c64f-426a-92de-a5831a11ce6a/sist-en-61010-031-2003>

3.4.1

ACCESSIBLE (of a part)

able to be touched with a standard test finger or test pin, when used as specified in 6.2

3.4.2

HAZARDOUS LIVE

capable of rendering an electric shock or electric burn in NORMAL CONDITION or SINGLE FAULT CONDITION (see 6.3.1 for values applicable to NORMAL CONDITION and 6.3.2 for the higher values deemed to be appropriate in SINGLE FAULT CONDITION)

3.4.3

HIGH INTEGRITY

not liable to become defective in such a manner as to cause a risk of HAZARD; a HIGH INTEGRITY part is considered as not subject to failure when tests under fault conditions are made

3.4.4

PROTECTIVE IMPEDANCE

component, assembly of components or the combination of BASIC INSULATION and a current or voltage limiting device, the impedance, construction and reliability of which are such that when connected between parts which are HAZARDOUS LIVE and ACCESSIBLE conductive parts, it provides protection to the extent required by this standard in NORMAL CONDITION and SINGLE FAULT CONDITION