

<b>STN</b>	<b>Bezpečnostné požiadavky na elektrické zariadenia na meranie, riadenie a laboratórne použitie. Časť 031: Bezpečnostné požiadavky na ručné zostavy sond na meranie a skúšanie.</b>	<b>STN EN 61010-031</b>  36 2000
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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

Táto norma obsahuje anglickú verziu európskej normy.  
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 01/16

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Oznámením tejto normy sa od 03.07.2018 ruší  
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Podľa zákona č. 264/1999 Z. z. v znení neskorších predpisov sa môžu slovenské technické normy rozmnožovať a rozširovať iba so súhlasom Úradu pre normalizáciu, metrológiu a skúšobníctvo SR.

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**EN 61010-031**

NORME EUROPÉENNE

EUROPÄISCHE NORM

July 2015

ICS 19.080

Supersedes EN 61010-031:2002

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 61010-031:2015)**

Règles de sécurité pour appareils électriques de mesure,  
de régulation et de laboratoire - Partie 031: Exigences de  
sécurité pour sondes équipées tenues à la main pour  
mesurage et essais électriques  
(IEC 61010-031:2015)

Sicherheitsbestimmungen für elektrische Mess-, Steuer-,  
Regel- und Laborgeräte - Teil 031:  
Sicherheitsbestimmungen für handgehaltenes  
Messzubehör zum Messen und Prüfen  
(IEC 61010-031:2015)

This European Standard was approved by CENELEC on 2015-07-03. 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 CEN-CENELEC Management Centre or to any CENELEC member.

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

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

**European foreword**

The text of document 66/569/FDIS, future edition 2 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 approved by CENELEC as EN 61010-031:2015.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2016-04-03
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2018-07-03

This document supersedes EN 61010-031:2002.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

This standard covers the Principle Elements of the Safety Objectives for Electrical Equipment Designed for Use within Certain Voltage Limits (LVD - 2006/95/EC).

**Endorsement notice**

The text of the International Standard IEC 61010-031:2015 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.
IEC 60270	NOTE	Harmonized as EN 60270.
IEC 60364-4-44	NOTE	Harmonized as HD 60634-4-44.
IEC 60664-1	NOTE	Harmonized as EN 60664-1.
IEC 60664-3:2003	NOTE	Harmonized as EN 60664-3:2003.
IEC 60664-3:2003/AMD1:2010	NOTE	Harmonized as EN 60664-3:2003/A1:2010.
IEC 60664-4:2005	NOTE	Harmonized as EN 60664-4:2006.
IEC 60990	NOTE	Harmonized as EN 60990.
IEC 61010 (series)	NOTE	Harmonized as EN 61010 (series).
IEC 61032:1997	NOTE	Harmonized as EN 61032:1998.

## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

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.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: [www.cenelec.eu](http://www.cenelec.eu).

<u>Publication</u>	<u>Year</u> series	<u>Title</u>	<u>EN/HD</u>	<u>Year</u> series
IEC 60027		Letter symbols to be used in electrical technology	EN 60027	
IEC 60529	-	Degrees of protection provided by enclosures (IP Code)	-	-
IEC 61010-1	2010	Safety requirements for electrical equipment for measurement, control and laboratory use -- Part 1: General requirements	EN 61010-1	2010
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	-	High-voltage test techniques for low-voltage equipment -- Part 2: Test equipment	EN 61180-2	-
IEC Guide 104	-	The preparation of safety publications and the use of basic safety publications and group safety publications	-	-
ISO/IEC Guide 51	-	Safety aspects - Guidelines for their inclusion in standards	-	-



# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



GROUP SAFETY PUBLICATION  
PUBLICATION GROUPEE DE SÉCURITÉ

**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**

**Règles de sécurité pour appareils électriques de mesurage, de régulation et de laboratoire –  
Partie 031: Exigences de sécurité pour sondes équipées tenues à la main pour mesurage et essais électriques**



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

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## 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

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

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

IEC 61010-031 is a stand-alone standard. This second edition cancels and replaces the first edition published in 2002 and Amendment 1:2008. This edition constitutes a technical revision.

This edition includes the following significant changes from the first edition, as well as numerous other changes:

- a) Voltages above the levels of 30 V r.m.s., 42,4 V peak, or 60 V d.c. are deemed to be HAZARDOUS LIVE instead of 33 V r.m.s., 46,7 V peak, or 70 V d.c.

- b) Servicing is now included within the scope.
- c) Extended environmental conditions are included within the scope.
- d) New terms have been defined.
- e) Tests for REASONABLY FORESEEABLE MISUSE have been added, in particular for fuses.
- f) Additional instruction requirements for probe assembly operation have been specified.
- g) Limit values for ACCESSIBLE parts and for measurement of voltage and touch current have been modified.
- h) SPACINGS requirements for mating of CONNECTORS have been modified.
- i) PROBE TIPS and SPRING-LOADED CLIPS requirements have been modified. The PROTECTIVE FINGERGUARD replace the BARRIER with new requirements.
- j) Insulation requirements (6.5) and test procedures (6.6.5) have been rewritten and aligned when relevant with Part 1. Specific requirements have been added for solid insulation and thin-film insulation.
- k) The terminology for MEASUREMENT CATEGORY I has been replaced with the designation “not RATED for measurements within MEASUREMENT CATEGORIES II, III, or IV”.
- l) The flexing/pull test (6.7.4.3) has been partially rewritten.
- m) Surface temperature limits (Clause 10) have been modified to conform to the limits of IEC Guide 117.
- n) Requirements for resistance of PROBE WIRES to mechanical stresses have been added in Clause 12 and a new Annex D.
- o) Requirements have been added regarding the prevention of HAZARD from arc flash and short-circuits for SPRING-LOADED CLIPS.
- p) A new informative Annex E defines the dimension of the 4 mm banana CONNECTORS.

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

FDIS	Report on voting
66/569/FDIS	66/571/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.

A list of all parts of the IEC 61010 series, under the general title, *Safety requirements for electrical equipment for measurement, control, and laboratory use*, may be found on the IEC website.

In this standard, the following print types are used:

- requirements and definitions: in roman type;
- NOTES and EXAMPLES: 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 the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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

**IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.**

# 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

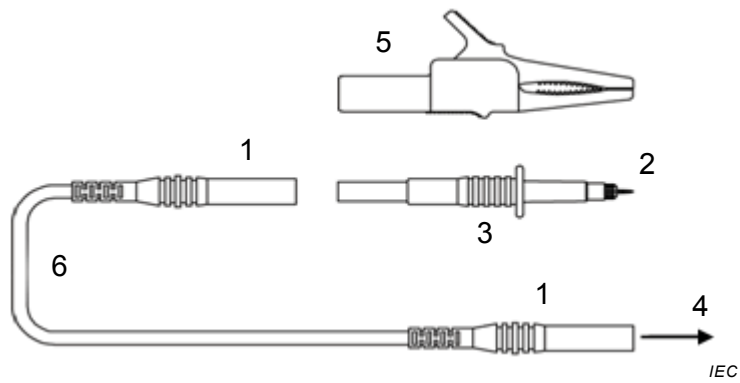
#### 1.1 Scope

##### 1.1.1 Probe assemblies included in scope

This part of IEC 61010 specifies safety requirements for hand-held and hand-manipulated probe assemblies of the types described below, and their related accessories. These probe assemblies are for direct electrical connection between a part and electrical test and measurement equipment. They may be fixed to the equipment or be detachable accessories for the equipment.

- a) Type A: low-voltage and high-voltage, non-attenuating probe assemblies. Non-attenuating probe assemblies that are **RATED** for direct connection to voltages exceeding 30 V r.m.s., 42,4 V peak, or 60 V d.c., but not exceeding 63 kV. They do not incorporate components which are intended to provide a voltage divider function or a signal conditioning function, but they may contain non-attenuating components such as fuses (see Figure 1.)
- b) Type B: high-voltage attenuating or divider probe assemblies. Attenuating or divider probe assemblies that are **RATED** for direct connection to secondary voltages exceeding 1 kV r.m.s. or 1,5 kV d.c. but not exceeding 63 kV r.m.s. or d.c. 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 (see Figure 2).
- c) Type C: low-voltage attenuating or divider probe assemblies. Attenuating or divider probe assemblies for direct connection to voltages 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 (see Figure 3).
- d) Type D: low-voltage attenuating, non-attenuating or other signal conditioning probe assemblies, that are **RATED** for direct connection only to voltages not exceeding 30 V r.m.s., or 42,4 V peak, or 60 V d.c., and are suitable for currents exceeding 8 A (see Figure 4).

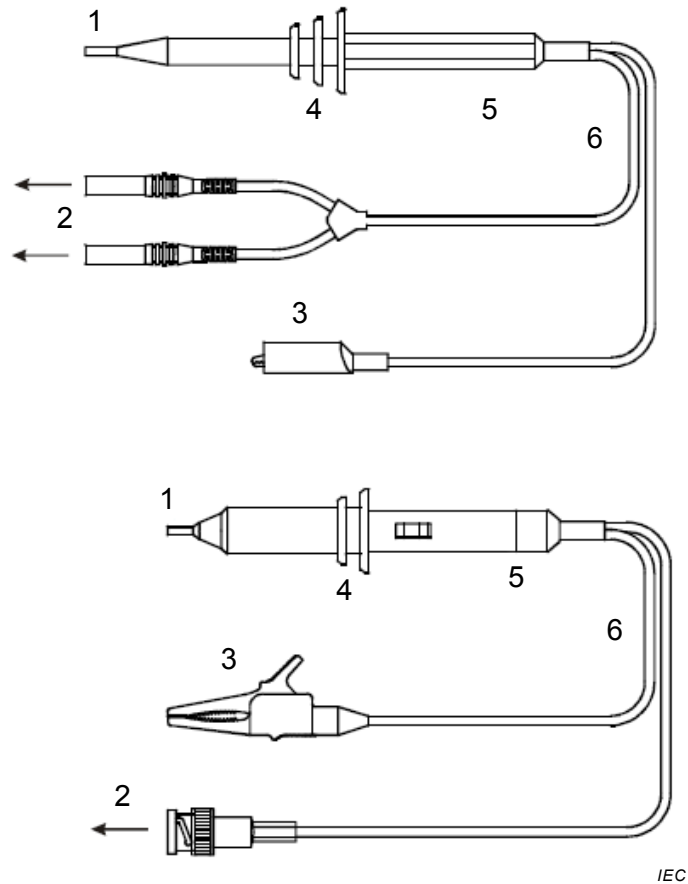




**Key**

- |                      |                      |
|----------------------|----------------------|
| 1 typical CONNECTORS | 4 to equipment       |
| 2 PROBE TIP          | 5 SPRING-LOADED CLIP |
| 3 probe body         | 6 PROBE WIRE         |

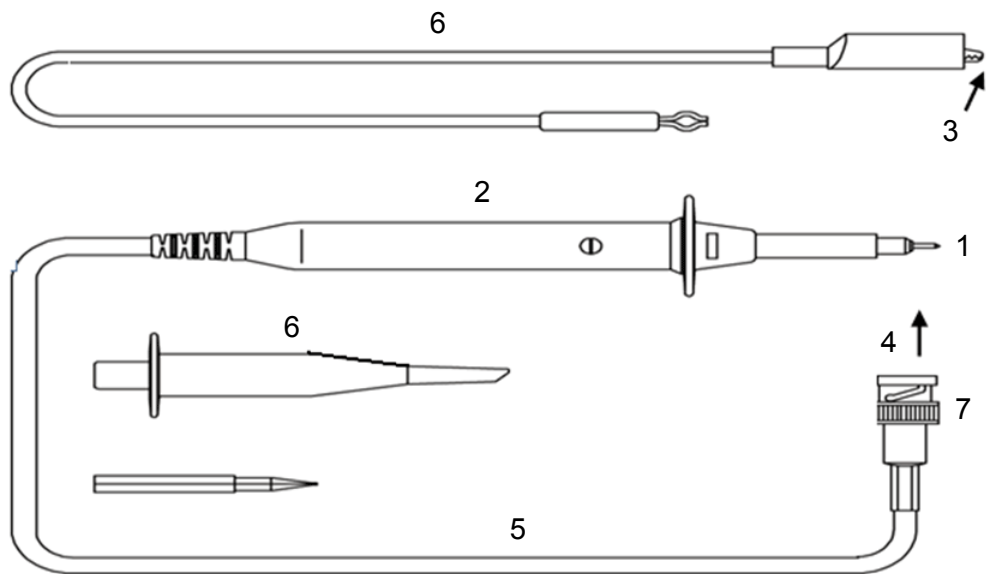
**Figure 1 – Examples of type A probe assemblies**



**Key**

- |                       |                                |
|-----------------------|--------------------------------|
| 1 PROBE TIP           | 4 PROTECTIVE FINGERGUARD       |
| 2 to equipment        | 5 hand-held area of probe body |
| 3 reference CONNECTOR | 6 PROBE WIRE                   |

**Figure 2 – Examples of type B probe assemblies**

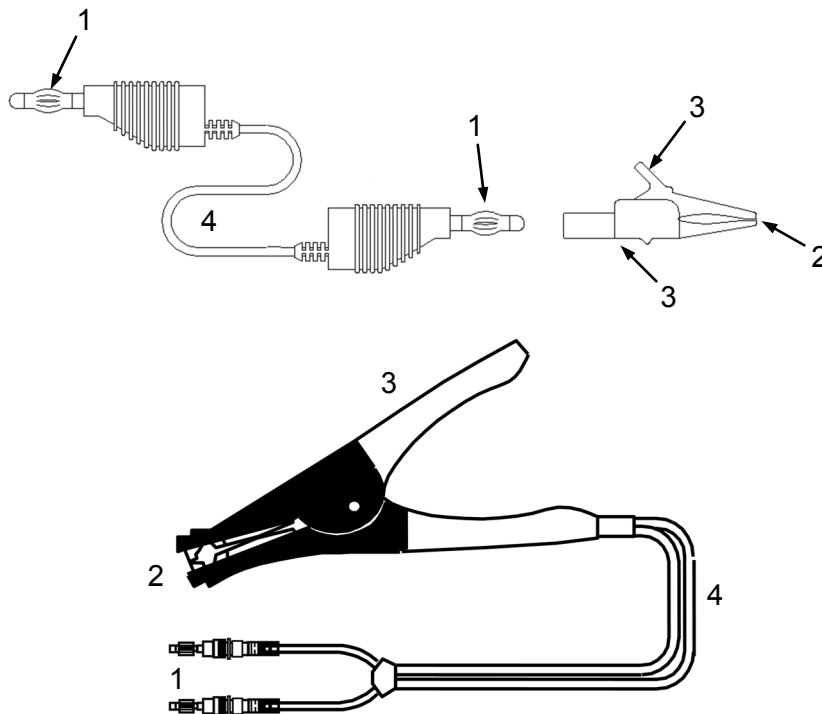


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**Key**

- |                       |                           |
|-----------------------|---------------------------|
| 1 PROBE TIP           | 5 PROBE WIRE              |
| 2 probe body          | 6 examples of accessories |
| 3 reference CONNECTOR | 7 BNC CONNECTOR           |
| 4 to equipment        |                           |

**Figure 3 – Examples of type C probe assemblies**



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**Key**

- |             |   |
|-------------|---|
| 1 CONNECTOR | 3 hand-held area of SPRING-LOADED CLIP or clamp |
| 2 PROBE TIP | 4 PROBE WIRE                                    |

**Figure 4 – Examples of type D probe assemblies**

### 1.1.2 Probe assemblies excluded from scope

This standard does not apply to current sensors within the scope of IEC 61010-2-032 (Hand-held and hand-manipulated current sensors), but may apply to their input measuring circuit leads and accessories.

## 1.2 Object

### 1.2.1 Aspects included in scope

The purpose of the requirements of this standard is to ensure that HAZARDS to the OPERATOR and the surrounding area are reduced to a tolerable level.

Requirements for protection against particular types of HAZARDS are given in Clauses 6 to 13, as follows:

- 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);
- e) arc flash (see Clause 13).

Additional requirements for probe assemblies which are designed to be powered from a low-voltage mains supply, or include other features not specifically addressed in this standard are in other parts of IEC 61010.

NOTE Attention is drawn to the possible existence of additional requirements regarding the health and safety of labour forces.

### 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.

## 1.3 Verification

This standard also specifies methods of verifying that the probe assembly meets the requirements of this standard, through inspection, TYPE TESTS, and ROUTINE TESTS.

## 1.4 Environmental conditions

### 1.4.1 Normal 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;
- b) ambient temperature of 5 °C to 40 °C;
- c) maximum relative humidity of 80 % for temperatures up to 31 °C decreasing linearly to 50 % relative humidity at 40 °C;
- d) applicable POLLUTION DEGREE of the intended environment.

### 1.4.2 Extended environmental conditions

This standard applies to probe assemblies designed to be safe not only in the environmental conditions specified in 1.4.1, but also in any of the following conditions as RATED by the manufacturer of the probe assemblies:

- a) outdoor use;
- b) altitudes above 2 000 m;
- c) ambient temperatures below 5 °C or above 40 °C;
- d) relative humidities above the levels specified in 1.4.1;
- e) WET LOCATIONS.

## 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 60027 (all parts), *Letters symbols to be used in electrical technology*

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

IEC 61010-1:2010, *Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements*

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

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

IEC GUIDE 104, *The preparation of safety publications and the use of basic safety publications and group safety publications*

ISO/IEC GUIDE 51, *Safety aspects – Guidelines for their inclusion in standards*

**koniec náhľadu – text ďalej pokračuje v platenej verzii STN**