

**OHUTUSNÕUDED ELEKTRILISTELE MÕÕTMIS-,
JUHTIMIS- JA LABORATOORIUMISEADMETELE.
OSA 2-033: ERINÕUDED KODU- JA
PROFESSIONAALKASUTUSEKS SOBIVATELE
KÄESHOITAVATELE MITMEPIIRKONNALISTELE
MÕÕTERIISTADELE JA MUUDELE MÕÕTERIISTADELE,
MIS VÕIMALDAVAD MÕÕTA VÕRGUPINGET**

**Safety requirements for electrical equipment for
measurement, control, and laboratory use - Part 2-033:
Particular requirements for hand-held multimeters for
domestic and professional use, capable of measuring
mains voltage (IEC 61010-2-033:2019)**

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN IEC 61010-2-033:2021+A11:2021 sisaldab Euroopa standardi EN IEC 61010-2-033:2021 ja selle muudatuse A11:2021 ingliskeelset teksti.	This Estonian standard EVS-EN IEC 61010-2-033:2021+A11:2021 consists of the English text of the European standard EN IEC 61010-2-033:2021 and its amendment A11:2021.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas. Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 12.11.2021, muudatused A11 12.11.2021.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation. Date of Availability of the European standard is 12.11.2021, for A11 12.11.2021.
Muudatusega A11 lisatud või muudetud teksti algus ja lõpp on tekstis tähistatud sümbolitega A11 A11 . Standard on kättesaadav Eesti Standardimis- ja Akrediteerimiskeskusest.	The start and finish of text introduced or altered by amendment A11 is indicated in the text by tags A11 A11 . The standard is available from the Estonian Centre for Standardisation and Accreditation.

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ICS 19.080; 71.040.10

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English Version

**Safety requirements for electrical equipment for measurement,
control, and laboratory use - Part 2-033: Particular requirements
for hand-held multimeters for domestic and professional use,
capable of measuring mains voltage
(IEC 61010-2-033:2019)**

Exigences de sécurité pour appareils électriques de
mesurage, de régulation et de laboratoire - Partie 2-033:
Exigences particulières pour les multimètres portatifs pour
usage domestique et professionnel, capables de mesurer la
tension réseau
(IEC 61010-2-033:2019)

Sicherheitsbestimmungen für elektrische Mess-, Steuer-,
Regel- und Laborgeräte - Teil 2-033: Besondere
Anforderungen an handgehaltene Multimeter und andere
handgehaltene Messgeräte für den Haushalt und
professionellen Gebrauch, geeignet zur Messung von
Netzspannungen
(IEC 61010-2-033:2019)

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Europäisches Komitee für Elektrotechnische Normung

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European foreword

The text of document 66/692/FDIS, future edition 2 of IEC 61010-2-033, 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 IEC 61010-2-033:2021.

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) 2022-05-12
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2024-11-12

This document supersedes EN 61010-2-033:2012 and all of its amendments and corrigenda (if any).

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This document has been prepared under a Standardization Request given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s) / Regulation(s).

For the relationship with EU Directive(s) / Regulation(s), see informative Annex ZZ, which is an integral part of EN IEC 61010-2-033:2021/A11:2021.

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The text of the International Standard IEC 61010-2-033:2019 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 61010-2-034	NOTE	Harmonized as EN IEC 61010-2-034
IEC 61557-1	NOTE	Harmonized as EN 61557-1
IEC 61557-2	NOTE	Harmonized as EN 61557-2
IEC 61557-3	NOTE	Harmonized as EN 61557-3
IEC 61557-4	NOTE	Harmonized as EN 61557-4
IEC 61557-5	NOTE	Harmonized as EN 61557-5
IEC 61557-6	NOTE	Harmonized as EN 61557-6
IEC 61557-7	NOTE	Harmonized as EN 61557-7

IEC 61557-8	NOTE	Harmonized as EN 61557-8
IEC 61557-9	NOTE	Harmonized as EN 61557-9
IEC 61557-10	NOTE	Harmonized as EN 61557-10
IEC 61557-11	NOTE	Harmonized as EN 61557-11
IEC 61557-12	NOTE	Harmonized as EN 61557-12

A11 Amendment A11 European foreword

This document (EN IEC 61010-2-033:2021/A11:2021) has been prepared by CLC/TC 66X "Safety of measuring, control, and laboratory equipment".

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INTERNATIONAL STANDARD

NORME INTERNATIONALE



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

**Part 2-033: Particular requirements for hand-held multimeters for domestic
and professional use, capable of measuring MAINS voltage**

**Exigences de sécurité pour appareils électriques de mesurage, de régulation
et de laboratoire –**

**Partie 2-033: Exigences particulières pour les multimètres portatifs pour usage
domestique et professionnel, capables de mesurer la tension RESEAU**



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INTERNATIONAL STANDARD

NORME INTERNATIONALE



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

**Part 2-033: Particular requirements for hand-held multimeters for domestic
and professional use, capable of measuring MAINS voltage**

**Exigences de sécurité pour appareils électriques de mesurage, de régulation
et de laboratoire –**

**Partie 2-033: Exigences particulières pour les multimètres portatifs pour usage
domestique et professionnel, capables de mesurer la tension RESEAU**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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INTERNATIONALE

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CONTENTS

FOREWORD	4
INTRODUCTION	7
1 Scope and object	8
2 Normative references	8
3 Terms and definitions	9
4 Tests	9
5 Marking and documentation	10
6 Protection against electric shock	12
7 Protection against mechanical HAZARDS	16
8 Resistance to mechanical stresses	16
9 Protection against the spread of fire	16
10 Equipment temperature limits and resistance to heat	16
11 Protection against HAZARDS from fluids and solid foreign objects	16
12 Protection against radiation, including laser sources, and against sonic and ultrasonic pressure	16
13 Protection against liberated gases and substances, explosion and implosion	16
14 Components and subassemblies	16
15 Protection by interlocks	17
16 HAZARDS resulting from application	17
17 RISK assessment	17
101 Measuring circuits	17
102 Indicating devices	22
Annexes	25
Annex K (normative) Insulation requirements not covered by 6.7	25
Annex L (informative) Index of defined terms	31
Annex AA (normative) Measurement categories	32
Annex BB (informative) HAZARDS pertaining to measurements performed in certain environments	35
Annex CC (informative) 4-mm "banana" TERMINALS	38
Annex DD (informative) Flowchart for insulation according to the type of circuit	40
A11 Annex ZA (normative) Normative references to international publications with their corresponding European publications A11	43
A11 Annex ZZ (informative) Relationship between this European standard and the safety objectives of Directive 2014/35/EU [2014 OJ L96] aimed to be covered A11	44
Bibliography	46
Figure 4 – Acceptable arrangement of protective means against electric shock	13
Figure AA.1 – Example to identify the locations of measuring circuits	33
Figure CC.1 – Recommended dimensions of 4-mm TERMINALS	39
Figure DD.1 – Requirements for CLEARANCE, CREEPAGE DISTANCE and solid insulation	42

Table 101 – CLEARANCES and CREEPAGE DISTANCES for measuring circuit TERMINALS with HAZARDOUS LIVE conductive parts up to 1 000 V a.c. or 1 500 V d.c.....	14
Table 102 – Impulse voltages	22
Table K.101 – CLEARANCES of measuring circuits RATED for MEASUREMENT CATEGORIES III and IV.....	26
Table K.102 – a.c. test voltages for testing electric strength of solid insulation in measuring circuits RATED for MEASUREMENT CATEGORIES III and IV.....	27
Table K.103 – Impulse test voltages for testing electric strength of solid insulation in measuring circuits RATED for MEASUREMENT CATEGORIES III and IV	27
Table K.104 – Test voltages for testing long-term stress of solid insulation in measuring circuits RATED for MEASUREMENT CATEGORIES III and IV	28
Table K.105 – Minimum values for distance or thickness of solid insulation in measuring circuits RATED for MEASUREMENT CATEGORIES III and IV.....	29
Table AA.1 – Characteristics of MEASUREMENT CATEGORIES	34
Table ZZ.1 — Correspondence between this European standard and Annex I of Directive 2014/35/EU [2014 OJ L96]	44

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 2-033: Particular requirements for hand-held multimeters for domestic and professional use, capable of measuring MAINS voltage

FOREWORD

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International Standard IEC 61010-2-033 has been prepared by IEC technical committee 66: Safety of measuring, control and laboratory equipment.

This second edition cancels and replaces the first edition published in 2012. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) The scope has been reduced to hand-held multimeters. Voltmeters and clamp multimeters have been removed. They are addressed respectively by IEC 61010-2-030 and IEC 61010-2-032. The relevant definitions have been removed.
- b) Subclause 4.4.2.101 has been relocated into Clause 102.
- c) CLEARANCES and CREEPAGE DISTANCES for WET LOCATIONS and for measuring circuit TERMINALS exceeding 1 000 V a.c. or 1 414 V d.c. have been specified.

- d) Subclause 14.101 related to "Circuits or components used as TRANSIENT OVERVOLTAGE limiting devices in measuring circuits used to measure MAINS" has been removed.
- e) References to IEC 61010-031 for probe assemblies and IEC 61010-2-032 for current sensors have been added.
- f) Requirements for protection against MAINS overvoltage measuring circuits have been added.
- g) Clause 102 has been rewritten.
- h) Requirements for measuring circuits from 1 000 V to 3 000 V have been added.
- i) An informative Annex CC about dimensions of 4-mm banana TERMINALS has been added.
- j) A flowchart for insulation according to the type of circuit has been added in a new Annex DD.

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

FDIS	Report on voting
66/692/FDIS	66/694/RVD

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

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

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

This Part 2-033 is to be used in conjunction with the latest edition of IEC 61010-1. It was established on the basis of the third edition (2010) of IEC 61010-1 and its Amendment 1 (2016), hereinafter referred to as Part 1.

This Part 2-033 supplements or modifies the corresponding clauses in IEC 61010-1 so as to convert that publication into the IEC standard: *Particular requirements for hand-held multimeters for domestic and professional use, capable of measuring MAINS voltage*.

Where a particular subclause of Part 1 is not mentioned in this Part 2-033, that subclause applies as far as is reasonable. Where this Part 2-033 states "addition", "modification", "replacement", or "deletion", the relevant requirement, test specification or note in Part 1 should be adapted accordingly.

In this standard:

- a) the following print types are used:
 - requirements: in roman type;
 - NOTES: in small roman type;
 - *conformity and tests: in italic type*;
 - terms used throughout this standard which have been defined in Clause 3: SMALL ROMAN CAPITALS;
- b) subclauses, figures, tables and notes which are additional to those in Part 1 are numbered starting from 101. Additional annexes are lettered starting from AA and additional list items are lettered from aa).

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INTRODUCTION

Part 2-030 specifies the safety requirements for equipment with testing and measuring circuits which are connected for test or measurement purposes to devices or circuits outside the measurement equipment itself. Requirements of Part 2-030 have been included in this Part 2-033. Equipment within the scopes of both Part 2-030 and Part 2-033 are considered to be covered by the requirements of this Part 2-033.

Part 2-032 specifies the safety requirements for hand-held and hand-manipulated current sensors. For equipment within the scope of Part 2-032 and Part 2-033, only Part 2-032 is applicable.

Part 2-034 specifies the safety requirements for measurement equipment for insulation resistance and test equipment for electric strength which are connected to units, lines or circuits for test or measurement purposes. For equipment within the scope of Part 2-033 and Part 2-034, only Part 2-034 is applicable.

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

Part 2-033: Particular requirements for hand-held multimeters for domestic and professional use, capable of measuring MAINS voltage

1 Scope and object

This clause of Part 1 is applicable except as follows:

1.1.1 Equipment included in scope

Replace the existing text with the following:

This part of IEC 61010 specifies safety requirements for hand-held multimeters for domestic and professional use, capable of measuring MAINS.

Hand-held multimeters are multi-range multifunction measuring instruments intended to measure voltage and other electrical quantities such as resistance or current. Their primary purpose is to measure voltage on a live MAINS. They are suitable to be supported by one hand during NORMAL USE.

1.1.2 Equipment excluded from scope

Add the following new item to the list and the following paragraph:

- aa) IEC 61557-1 to IEC 61557-12, *Electrical safety in low voltage distribution systems up to 1 000 V a.c. and 1 500 V d.c. – Equipment for testing, measuring or monitoring of protective measures*

HAND-HELD EQUIPMENT such as oscilloscopes, wattmeters, process control multimeters not RATED for measuring voltage on a live MAINS, clamp multimeters and communications test sets are not within the scope of this document.

1.2.1 Aspects included in scope

Add the following two new paragraphs at the end of the subclause:

Requirements for protection against HAZARDS resulting from NORMAL USE and REASONABLY FORESEEABLE MISUSE of measuring circuits are given in Clause 101.

Requirements for reliance on the displayed value are given in Clause 102.

2 Normative references

This clause of Part 1 is applicable except as follows:

Replace "IEC 61010-031" with the following new reference:

IEC 61010-031:2015, *Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 031: Safety requirements for hand-held and hand-manipulated probe assemblies for electrical test and measurement*
IEC 61010-031:2015/AMD1:2018

Replace "IEC 61180-1 (all parts)", "IEC 61180-1" and "IEC 61180-2", with the following new reference:

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

Add the following new normative reference:

IEC 61010-2-032, *Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 2-032: Particular requirements for hand-held and hand-manipulated current sensors for electrical test and measurement*

3 Terms and definitions

This clause of Part 1 is applicable except as follows:

3.5 Safety terms

Replace the definition of 3.5.4 with the following new definition:

3.5.4

MAINS

electricity supply system

Add the following new term and definition:

3.5.101

MEASUREMENT CATEGORY

classification of testing and measuring circuits according to the type of MAINS to which they are intended to be connected

Note 1 to entry: MEASUREMENT CATEGORIES take into account OVERVOLTAGE CATEGORIES, short-circuit current levels, the location in the building installation where the test or measurement is to be made, and some forms of energy limitation or transient protection included in the building installation. See Annex AA for more information.

4 Tests

This clause of Part 1 is applicable, except as follows:

4.3.2.5 MAINS supply

Replace the existing title and the text with:

4.3.2.5 Power supply

The following requirements apply.

- a) The MAINS supply voltage shall be between 90 % and 110 % of any RATED supply voltage for which the equipment can be set or, if the equipment is RATED for a greater fluctuation, at any supply voltage within the fluctuation range.
- b) The MAINS frequency shall be any RATED frequency.
- c) Equipment for both a.c. and d.c. shall be connected to an a.c. or d.c. supply.
- d) Equipment powered by single-phase a.c. MAINS supply shall be connected both with normal and reverse polarity.
- e) If the means of connection permits reversal, battery-operated and d.c. equipment shall be connected with both reverse and normal polarity.