IEC 61010-2-033

Edition 3.0 2023-09

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Safety requirements for electrical equipment for measurement, control, and laboratory use –
Part 2-033: Particular requirements for hand-held multimeters and other meters 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 réseau



IEC 61010-2-033:2023-09(en-fr)



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

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

FOREWORD

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

This third edition cancels and replaces the second edition published in 2019. This edition constitutes a technical revision.

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

a) Clause 2, all normative references have been dated and new normative references have been added;
b) 4.4.2.101 is a new subclause about surge protective devices;

c) Subclause 6.6.101 modifies 6.6.101 and 6.6.102 of previous edition:
   1) in 6.6.101.1, insulating material of group I may be allowed for determination of CREEPAGE DISTANCES of measuring circuit TERMINALS;
   2) in 6.6.101.2, CLEARANCES and CREEPAGE DISTANCES up to 3 000 V for measuring circuit TERMINALS in unmated position have been defined;
   3) in 6.6.101.3, requirements for measuring circuit TERMINALS in partially mated position have been specified;
   4) in 6.6.101.4, requirements for measuring circuit TERMINALS in mated position have been specified;
   5) Subclause 6.6.101.5 replaces 6.6.102;
d) Subclause 6.101 replaces 6.9.101 of the previous edition with modifications;
e) 9.101 is a new subclause to consider the protection of measuring circuits against the spread of fire and arc flash;
f) in 9.101.2, relocation of 101.3 of previous edition;
g) in 9.101.3, relocation of 101.4 of previous edition;
h) in 101.3, relocation of Clause 102 of previous edition;
i) in K.2.1, another method for determination of CLEARANCES of secondary circuits is proposed;
j) in K.3.2, new Table K.15 and Table K.16 for CLEARANCE calculation;
k) Clause K.4 of the previous edition has been deleted;
l) Subclause K.101.4 has been reviewed;
m) Table K.104 of the previous edition has been deleted;
n) Annex AA: Figure AA.1 has been redesigned;
o) Annex EE: addition of a new informative annex for determination of CLEARANCES for the purposes of Table 101.

The text of this International Standard is based on the following documents:

Draft	Report on voting
66/787/FDIS	66/797/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

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*, can be found on the IEC website.

This document is to be used in conjunction with IEC 61010-1:2010 and IEC 61010-1:2010/AMD1:2016.

This document 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 and other meters for domestic and professional use, capable of measuring mains voltage.*

Where a particular subclause of IEC 61010-1 is not mentioned in this document, that subclause applies as far as is reasonable. Where this document states "addition", "modification", "replacement", or "deletion" the relevant requirement, test specification or note in IEC 61010-1 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 IEC 61010-1 are numbered starting from 101. Additional annexes are lettered starting from AA and additional list items are lettered from aa).

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

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

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INTRODUCTION

IEC 61010-1 specifies the safety requirements that are generally applicable to all equipment within its scope. For certain types of equipment, the requirements of IEC 61010-1 and its amendment will be supplemented or modified by the special requirements of one or more standard from the IEC 61010-2 series which is/are read in conjunction with the requirements of IEC 61010-1.

1) IEC 61010-2-030:2023 specifies the safety requirements for equipment with testing or measuring circuits which are connected for test or measurement purposes to devices or circuits outside the measurement equipment itself.
2) IEC 61010-2-032:2023 specifies the safety requirements for hand-held and hand-manipulated current sensors for measuring, detecting, injecting current, or indicating current waveforms on circuits without physically opening the current path of the circuit being measured.

   Most of the requirements of IEC 61010-2-030:2023 have been included in IEC 61010-2-032:2023. Equipment within the scopes of both IEC 61010-2-030:2023 and IEC 61010-2-032:2023 is considered to be covered by the requirements of IEC 61010-2-032:2023.

   However, for current sensors in combined equipment with protective bonding and automatic disconnection of the supply, IEC 61010-2-030:2023 and IEC 61010-2-032:2023 are read in conjunction.
3) This document specifies the safety requirements for hand-held multimeters and other meters for domestic and professional use, capable of measuring mains voltage, intended to measure voltage and other electrical quantities such as resistance or current.

   All relevant requirements of IEC 61010-2-030:2023 have been included in this document.
4) IEC 61010-2-034:2023 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.

   All relevant requirements of IEC 61010-2-030:2023 have been included in IEC 61010-2-034:2023. However, for equipment within the scope of IEC 61010-2-032:2023 and IEC 61010-2-034:2023, these standards are read in conjunction.

IEC 61010-031 specifies the safety requirements for hand-held and hand-manipulated probe assemblies and their related accessories intended to be used in particular with equipment in the scope of IEC 61010-2-030, IEC 61010-2-032, this document, and IEC 61010-2-034. These probe assemblies are for non-contact or 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.

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

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

1 Scope and object

IEC 61010-1:2010, Clause 1 and IEC 61010-1:2010/AMD1:2016, Clause 1 apply except as follows:

1.1.1 Equipment included in scope

Replace the existing text with the following:

This document specifies safety requirements for hand-held multimeters and other meters 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 (all parts), *Electrical safety in low voltage distribution systems up to 1 000 V AC and 1 500 V DC – 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

Replace item c) of the second paragraph with the following new item c):

c) spread of fire or arc flash from the hand-held multimeters (see Clause 9);

Replace the third paragraph with the following two new paragraphs:

Requirements for protection against HAZARDS arising from NORMAL USE, REASONABLY FORESEEABLE MISUSE and ergonomic factors are specified in Clause 16 and Clause 101.

Annex BB provides guidance to equipment manufacturers on HAZARDS that should be considered for equipment intended for performing tests and measurements on hazardous conductors, including MAINS conductors and telecommunication network conductors.