



UL 61010-031

STANDARD FOR SAFETY

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

UL Standard for 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, UL 61010-031

Second Edition, Dated January 27, 2017

Summary of Topics

This revision of ANSI/UL 61010-031, dated January 7, 2020 includes the following changes in requirements:

Revision to remove existing national deviation clause 8.4DV.

Revision to the national deviations in the Normative Reference.

Adoption of IEC 61010-031 Edition 2.1 issued 2018-05 Amendment 1 which included a title change.

UL 61010-031 is an adoption of IEC 61010-031, 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, second edition (issued May 2015) and its amendment 1 (issued May 2018). Please note that the National Difference document incorporates all of the US National Differences for UL 61010-031.

As noted in the Commitment for Amendments statement located on the back side of the title page, UL and CSA are committed to updating this bi-national standard jointly.

Text that has been changed in any manner or impacted by UL's electronic publishing system is marked with a vertical line in the margin.

The new and revised requirements are substantially in accordance with Proposal(s) on this subject dated August 16, 2019.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form by any means, electronic, mechanical photocopying, recording, or otherwise without prior permission of UL.

UL provides this Standard "as is" without warranty of any kind, either expressed or implied, including but not limited to, the implied warranties of merchantability or fitness for any purpose.

In no event will UL be liable for any special, incidental, consequential, indirect or similar damages, including loss of profits, lost savings, loss of data, or any other damages arising out of the use of or the inability to use this Standard, even if UL or an authorized UL representative has been advised of the possibility of such damage. In no event shall UL's liability for any damage ever exceed the price paid for this Standard, regardless of the form of the claim.

Users of the electronic versions of UL's Standards for Safety agree to defend, indemnify, and hold UL harmless from and against any loss, expense, liability, damage, claim, or judgment (including reasonable attorney's fees) resulting from any error or deviation introduced while purchaser is storing an electronic Standard on the purchaser's computer system.

No Text on This Page



CSA Group
CAN/CSA-C22.2 No. 61010-031:17
Second Edition
(IEC 61010-031:2015, MOD)



Underwriters Laboratories Inc.
UL 61010-031
Second Edition

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

January 27, 2017

(Title Page Reprinted: January 7, 2020)

This national standard is based on publication IEC 61010-031, second edition (2015-05) and Amendment 1 (2018-05).



ANSI/UL 61010-031-2020



[This is a preview. Click here to purchase the full publication.](#)

Commitment for Amendments

This standard is issued jointly by the Canadian Standards Association (operating as “CSA Group”) and Underwriters Laboratories Inc. (UL). Comments or proposals for revisions on any part of the standard may be submitted to CSA Group or UL at anytime. Revisions to this standard will be made only after processing according to the standards development procedures of CSA Group and UL. CSA Group and UL will issue revisions to this standard by means of a new edition or revised or additional pages bearing their date of issue.

ISBN 978-1-4883-0720-1 © 2017 Canadian Standards Association

All rights reserved. No part of this publication may be reproduced in any form whatsoever without the prior permission of the publisher.

This Standard is subject to review within five years from the date of publication, and suggestions for its improvement will be referred to the appropriate committee. The technical content of IEC and ISO publications is kept under constant review by IEC and ISO. To submit a proposal for change, please send the following information to inquiries@csagroup.org and include "Proposal for change" in the subject line: Standard designation (number); relevant clause, table, and/or figure number; wording of the proposed change; and rationale for the change.

To purchase CSA Group Standards and related publications, visit CSA Group's Online Store at store.csagroup.org or call toll-free 1-800-463-6727 or 416-747-4044.

Copyright © 2020 Underwriters Laboratories Inc.

UL's Standards for Safety are copyrighted by UL. Neither a printed nor electronic copy of a Standard should be altered in any way. All of UL's Standards and all copyrights, ownerships, and rights regarding those Standards shall remain the sole and exclusive property of UL.

This ANSI/UL Standard for Safety consists of the Second edition including revisions through January 7, 2020. The most recent designation of ANSI/UL 61010-031 as an American National Standard (ANSI) occurred on January 7, 2020. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, Title Page (front and back), or the Preface. The National Difference Page and IEC Foreword are also excluded from the ANSI approval of IEC-based standards.

Comments or proposals for revisions on any part of the Standard may be submitted to UL at any time. Proposals should be submitted via a Proposal Request in UL's On-Line Collaborative Standards Development System (CSDS) at <https://csds.ul.com>.

To purchase UL Standards, visit UL's Standards Sales Site at <http://www.shopulstandards.com/HowToOrder.aspx> or call toll-free 1-888-853-3503.

CONTENTS

PREFACE	5
NATIONAL DIFFERENCES	7
FOREWORD	9
1 Scope and object	13
1.1 Scope	13
1.2 Object	17
1.3 Verification	17
1.4 Environmental conditions	17
2 Normative references	18
2DV Modification of Clause 2 to add the following reference publications:	19
3 Terms and definitions	19
3.1 Parts and accessories	19
3.2 Quantities	20
3.3 Tests	21
3.4 Safety terms	21
3.5 Insulation	21
4 Tests	22
4.1 General	22
4.2 Sequence of tests	23
4.3 Reference test conditions	23
4.4 Testing in SINGLE FAULT CONDITION	24
4.5 Tests in REASONABLY FORESEEABLE MISUSE	26
5 Marking and documentation	27
5.1 Marking	27
5.2 Warning markings	29
5.3 Durability of markings	30
5.4 Documentation	30
6 Protection against electric shock	32
6.1 General	32
6.2 Determination of ACCESSIBLE parts	32
6.3 Limit values for ACCESSIBLE parts	35
6.4 Means of protection against electric shock	42
6.5 Insulation requirements	47
6.6 Procedure for voltage tests	62
6.7 Constructional requirements for protection against electric shock	66
7 Protection against mechanical HAZARDS	72
8 Resistance to mechanical stresses	72
8.1 General	72
8.2 Rigidity test	72
8.3 Drop test	72
8.4 Impact swing test	73
8.4DV National Difference Deleted	73
9 Temperature limits and protection against the spread of fire	73
9.1 General	73
9.2 Temperature tests	74
10 Resistance to heat	74
10.1 Integrity of SPACINGS	74
10.2 Resistance to heat	74
11 Protection against HAZARDS from fluids	75
11.1 General	75

11.2	Cleaning	75
11.3	Specially protected probe assemblies	75
12	Components	75
12.1	General	75
12.1DV	Modification by adding the following as the first paragraph of Clause 12.1:	75
12.2	Fuses	76
12.3	PROBE WIRE	76
13	Prevention of HAZARD from arc flash and short-circuits	82
13.1	General	82
13.2	Exposed conductive parts	82

Annex A (normative) Measuring circuits for touch current

A.1	Measuring circuits for a.c. with frequencies up to 1 MHz and for d.c.	84
A.2	Measuring circuits for a.c. with sinusoidal frequencies up to 100 Hz and for d.c.	85
A.3	Current measuring circuit for electrical burns at frequencies above 100 kHz	86
A.4	Current measuring circuit for WET LOCATIONS	87

Annex B (normative) Standard test fingers

Annex C (normative) Measurement of CLEARANCES and CREEPAGE DISTANCES

Annex D (normative) Routine spark tests on PROBE WIRE

D.1	General	94
D.2	Spark test procedure	94
D.3	Routine spark test method for PROBE WIRE	96

Annex E (informative) 4 mm CONNECTORS

E.1	General	98
E.2	Dimensions	98

Annex F (normative) MEASUREMENT CATEGORIES

F.1	General	101
F.2	MEASUREMENT CATEGORIES	101
F.2.1	MEASUREMENT CATEGORY II	101
F.2.2	MEASUREMENT CATEGORY III	101
F.2.3	MEASUREMENT CATEGORY IV	101
F.2.4	Probe assemblies without a MEASUREMENT CATEGORY RATING	101

Annex G Index of defined terms

Bibliography

PREFACE

This is the harmonized CSA Group and UL standard for *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*. It is the second edition of CAN/CSA-C22.2 No. 61010-031 and the second edition of UL 61010-031. This edition of CAN/CSA-C22.2 No. 61010-031 supersedes the previous edition published on March 30, 2007. This edition of UL 61010-031 supersedes the previous edition published on March 30, 2007. This harmonized standard has been jointly revised on January 7, 2020. For this purpose, CSA Group and UL are issuing revision pages dated January 20, 2020.

This harmonized standard is based on IEC Publication 61010-031: second edition, *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*, issued May 2015, as revised by Amendment 1 issued May 2018. IEC 61010-031 is copyrighted by the IEC.

This standard is considered suitable for use for conformity assessment within the stated scope of the standard.

This standard was reviewed by the CSA Subcommittee on Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use, under the jurisdiction of the CSA Technical Committee on Consumer and Commercial Products and the CSA Strategic Steering Committee on Requirements for Electrical Safety, and has been formally approved by the CSA Technical Committee. This standard has been developed in compliance with Standards Council of Canada requirements for National Standards of Canada. It has been published as a National Standard of Canada by CSA Group.

Application of Standard

Where reference is made to a specific number of samples to be tested, the specified number is to be considered a minimum quantity.

Note: Although the intended primary application of this standard is stated in its scope, it is important to note that it remains the responsibility of the users of the standard to judge its suitability for their particular purpose.

Level of Harmonization

This standard adopts the IEC text with national differences.

This standard is published as an identical standard for CSA Group and UL.

An identical standard is a standard that is exactly the same in technical content except for national differences resulting from conflicts in codes and governmental regulations. Presentation is word for word except for editorial changes.

All national differences from the IEC text are included in the CSA Group and UL versions of the standard. While the technical content is the same in each organization's version, the format and presentation may differ.

Reasons for Differences from IEC

National Differences from the IEC are being added in order to address safety and regulatory situations present in the US and Canada.

Interpretations

The interpretation by the standards development organization of an identical or equivalent standard is based on the literal text to determine compliance with the standard in accordance with the procedural rules of the standards development organization. If more than one interpretation of the literal text has been identified, a revision is to be proposed as soon as possible to each of the standards development organizations to more accurately reflect the intent.

IEC Copyright

For CSA Group, the text, figures, and tables of International Electrotechnical Commission Publication 61010-031, 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, copyright 2015 including Amendment 1 2018, are used in this standard with the consent of the International Electrotechnical Commission. The IEC Foreword is not a part of the requirements of this standard but is included for information purposes only.

These materials are subject to copyright claims of IEC and UL. No part of this publication may be reproduced in any form, including an electronic retrieval system, without the prior written permission of UL. All requests pertaining to the 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 UL 61010-031 Standard should be submitted to UL.