

BSI Standards Publication

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

Documents
Document Sharing Hub

National foreword

This British Standard is the UK implementation of EN IEC 61010-2-032:2021 incoporating amendment A11:2021. It is derived from IEC 61010-2-032:2019 incorporating IEC corrigendum 1:2020. It supersedes BS EN 61010-2-032:2012, which will be withdrawn on 12 November 2024.

The text of amendment A11:2021 to EN IEC 61010-2-032:2021 is collated in its entirety after the CENELEC endorsement pages. The text of corrigendum 1:2020 to IEC 61010-2-032:2019 is collated in its entirety before the IEC core text pages. BSI's policy of providing consolidated content remains unchanged; however, in the interest of expediency, in this instance BSI have chosen to collate the relevant content at the end of this document.

The UK participation in its preparation was entrusted to Technical Committee EPL/66, Safety of measuring, control and laboratory equipment.

A list of organizations represented on this committee can be obtained on request to its committee manager.

This publication has been prepared under a mandate given to the European Standards Organizations by the European Commission and the European Free Trade Association. It is intended to support requirements of the EU legislation detailed in the European Foreword. A European Annex, usually Annex ZA or ZZ, describes how this publication relates to that EU legislation.

For the Great Britain market (England, Scotland and Wales), if UK Government has designated this publication for conformity with UKCA marking (or similar) legislation, it may contain an additional National Annex. Where such a National Annex exists, it shows the correlation between this publication and the relevant UK legislation. If there is no National Annex of this kind, the relevant Annex ZA or ZZ in the body of the European text will indicate the relationship to UK regulation applicable in Great Britain. References to EU legislation may need to be read in accordance with the UK designation and the applicable UK law. Further information on designated standards can be found at www.bsigroup.com/standardsandregulation.

For the Northern Ireland market, UK law will continue to implement relevant EU law subject to periodic confirmation. Therefore Annex ZA/ZZ in the European text, and references to EU legislation, are still valid for this market.

UK Government is responsible for legislation. For information on legislation and policies relating to that legislation, consult the relevant pages of www.gov.uk.

Contractual and legal considerations

This publication has been prepared in good faith, however no representation, warranty, assurance or undertaking (express or implied) is or will be made, and no responsibility or liability is or will be accepted by BSI in relation to the adequacy, accuracy, completeness or reasonableness of this publication. All and any such responsibility and liability is expressly disclaimed to the full extent permitted by the law.

AVA Documents
Document Sharing Hub

This publication is provided as is, and is to be used at the recipient's own risk.

The recipient is advised to consider seeking professional guidance with respect to its use of this publication.

This publication is not intended to constitute a contract. Users are responsible for its correct application.

© The British Standards Institution 2022
Published by BSI Standards Limited 2022

ISBN 978 0 580 51010 6

ICS 11.080.10; 19.080

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 March 2022.

Amendments/corrigenda issued since publication

Date	Text affected

Documents
Document Sharing Hub

Full document details: BS EN IEC 61010-2-032:2021+A11:2021

Documents
Document Sharing Hub

Full document details: BS EN IEC 61010-2-032:2021+A11:2021

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 61010-2-032

November 2021

ICS 19.080

Supersedes EN 61010-2-032:2012 and all of its amendments and corrigenda (if any)

English Version

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 (IEC 61010-2-032:2019 + COR1:2020)

Exigences de sécurité pour appareils électriques de mesurage, de régulation et de laboratoire - Partie 2-032 : Exigences particulières pour les capteurs de courant, portatifs et manipulés manuellement, pour essai électrique et mesurage (IEC 61010-2-032:2019 + COR1:2020)

Sicherheitsbestimmungen für elektrische Mess-, Steuer-, Regel- und Laborgeräte - Teil 2-032: Besondere Anforderungen für handgehaltene und handbediente Stromsonden für elektrische Prüfungen und Messungen (IEC 61010-2-032:2019 + COR1:2020)

This European Standard was approved by CENELEC on 2019-07-26. 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.

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 CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

© 2021 CENELEC All rights of exploitation in any form and by any means reserved worldwide for CENELEC Members.

Ref. No. EN IEC 61010-2-032:2021 E

Documents Document Sharing Hub

Full document details: BS EN IEC 61010-2-032:2021+A11:2021

European foreword

The text of document 66/691/FDIS, future edition 4 of IEC 61010-2-032, 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 61010-2-032:2021.

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 61010-2-032:2012 and all of its amendments and corrigenda (if any).

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

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 61010-2-032:2021/A11:2021.

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

Endorsement notice

The text of the International Standard IEC 61010-2-032:2019 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 61010-2-033	NOTE	Harmonized as EN IEC 61010-2-033
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

Documents
Document Sharing Hub

Full document details: BS EN IEC 61010-2-032:2021+A11:2021

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

Documents
Document Sharing Hub

Full document details: BS EN IEC 61010-2-032:2021+A11:2021

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 61010-2-032:2021+A11

November 2021

ICS 19.080

English Version

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

Exigences de sécurité pour appareils électriques de mesurage, de régulation et de laboratoire - Partie 2-032 : Exigences particulières pour les capteurs de courant, portatifs et manipulés manuellement, pour essai électrique et mesurage

Sicherheitsbestimmungen für elektrische Mess-, Steuer-, Regel- und Laborgeräte - Teil 2-032: Besondere Anforderungen für handgehaltene und handbediente Stromsonden für elektrische Prüfungen und Messungen

This amendment A11 modifies the European Standard EN IEC 61010-2-032:2021; it was approved by CENELEC on 2021-01-04. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment 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.

This amendment 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 CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

© 2021 CENELEC All rights of exploitation in any form and by any means reserved worldwide for CENELEC Members.

Ref. No. EN IEC 61010-2-032:2021/A11:2021 E

Documents
Document Sharing Hub

Full document details: BS EN IEC 61010-2-032:2021+A11:2021

European foreword

This document (EN IEC 61010-2-032:2021/A11:2021) has been prepared by CLC/TC 66X “Safety of measuring, control, and laboratory equipment”.

The following dates are fixed:

• latest date by which this 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 this document have to be withdrawn	(dow)	2024-11-12

This document amends EN IEC 61010-2-032:2021.

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

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 relationship with EU Directive(s) / Regulation(s), see informative Annex ZZ, which is an integral part of this document.

Any feedback and questions on this document should be directed to the users’ national committee. A complete listing of these bodies can be found on the CENELEC website.

Documents
Document Sharing Hub

Full document details: BS EN IEC 61010-2-032:2021+A11:2021

1 General

*Change the term "*PROTECTIVE BARRIER*" to "*PROTECTIVE FINGERGUARD*" throughout the document, except for item 1) of K.101.4.1.3.*

2 Modification to 3.2, "Parts and accessories"

Add the following new term and definition:

"3.2.103

PROTECTIVE FINGERGUARD

part of the ENCLOSURE that indicates the limit of safe access and that reduces the RISK of the OPERATOR touching HAZARDOUS LIVE parts"

3 Modification to 6.8.3.2, "The d.c. voltage test"

Add a new sentence at the beginning of the first paragraph:

"*The voltage tester shall have a regulated output capable of maintaining the test voltage throughout the test within ± 5 % of the specified value.*"

4 Modifications to 8.101, "JAW ENDS abrasion test"

Replace the last sentence of the first paragraph as follows:

"The requirements of this subclause do not apply to current sensors with a sliding JAW, current sensors with fork-style JAWS and flexible current sensors."

Replace the sixth paragraph as follows:

"*The samples are moved along the plate over a distance of 200 mm, or a lesser amount if restricted by the design, for 50 cycles – one cycle consisting of one forward and one reverse movement – so as to abrade the closing point of the JAWS (see Figure 103). The emery cloth is replaced after each sample has been treated.*

a) If the JAW ENDS include a wear indicator, the test has a minimum of 25 cycles. The test is terminated 2 cycles after the wear indicator becomes visible, but not more than 50 cycles.

NOTE 25 cycles are performed if the wear indicator becomes visible before the 23rd cycle and 50 cycles are performed if the wear indicator is not visible before the 48th cycle.

b) If the JAW ENDS do not include a wear indicator, the test is terminated when 50 cycles are completed."

5 Modifications to K.101.4.1, "General"

Replace the second paragraph with the following note:

"

NOTE 1 The manufacturer is supposed to take the expected life of the current sensor into account when selecting insulating materials."

As a result of this, renumber the existing note as NOTE 2.

6 Addition of Annex ZA, "Normative references to international publications with their corresponding European publications"

Add the following Annex ZA:

"

Documents
Document Sharing Hub
Full document details: BS EN IEC 61010-2-032:2021+A11:2021

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.

Annex ZA of EN 61010-1:2010[1] is applicable, with the following addition:

Publication	Year	Title	EN/HD and IEC/ISO	Year
IEC 61010-031 +AMD1	2015 2018	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	EN 61010-031 +A1 +A11	2015 2021 2021
IEC 61180	-	High-voltage test techniques for low-voltage equipment - Definitions, test and procedure requirements, test equipment	EN 61180	2016

“

[1] As impacted by EN 61010-1:2010/A1:2019 and EN 61010-1:2010/A1:2019/AC:2019-04.

Documents
Document Sharing Hub

Full document details: BS EN IEC 61010-2-032:2021+A11:2021

7 Addition of Annex ZZ, “Relationship between this European standard and the safety objectives of Directive 2014/35/EU [2014 OJ L96] aimed to be covered”

Add the following Annex ZZ:

“

Documents
Document Sharing Hub

Full document details: BS EN IEC 61010-2-032:2021+A11:2021

Annex ZZ
(informative)

Relationship between this European standard and the safety objectives of Directive 2014/35/EU [2014 OJ L96] aimed to be covered

This European Standard has been prepared under a Commission's standardization request relating to harmonized standards in the field of the Low Voltage Directive, M/511, to provide one voluntary means of conforming to safety objectives of Directive 2014/35/EU of the European Parliament and of the Council of 26 February 2014 on the harmonization of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits [2014 OJ L96].

Once this standard is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of this standard given in Table ZZ.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding safety objectives of that Directive, and associated EFTA regulations.

Table ZZ.1 — Correspondence between this European standard and Annex I of Directive 2014/35/EU [2014 OJ L96]

Safety objectives of Directive 2014/35/EU (Annex I)	Clause(s) / subclause(s) of this EN	Remarks / Notes
1. General conditions		
1 (a) the essential characteristics, the recognition and observance of which will ensure that electrical equipment will be used safely and in applications for which it was made, shall be marked on the electrical equipment, or, if this is not possible, on an accompanying document	5 EE.3	
1 (b) the electrical equipment, together with its component parts, shall be made in such a way as to ensure that it can be safely and properly assembled and connected	5.4, 6.6, 6.10, 6.11, 101 Annex D, Annex F, Annex EE	
1 (c) the electrical equipment shall be so designed and manufactured as to ensure that protection against the hazards set out in points 2 and 3 is ensured, providing that the equipment is used in applications for which it was made and is adequately maintained	5.4 17 (for hazards not covered by Clauses 6–16) Annex F	See also the details in points 2 and 3
2. Protection against hazards arising from the electrical equipment Measures of a technical nature shall be laid down in accordance with point 1, in order to ensure that:		

Documents
Document Sharing Hub
Full document details: BS EN IEC 61010-2-032:2021+A11:2021

Safety objectives of Directive 2014/35/EU (Annex I)	Clause(s) / subclause(s) of this EN	Remarks / Notes
2 (a) persons and domestic animals are adequately protected against the danger of physical injury or other harm which might be caused by direct or indirect contact	4, 6.1 – 6.11, 9.6, 11.6, 14.4, 101, 102 Annex D, Annex F, Annex K, Annex EE	
2 (b) temperatures, arcs or radiation which would cause a danger, are not produced	4, 9.5, 9.6, 10.1 −10.5, 12, 101.3.2, 101.4	
2 (c) persons, domestic animals and property are adequately protected against non-electrical dangers caused by the electrical equipment which are revealed by experience	4, 7.2- 7.7 9, 12.3, 12.5, 12.6, 13.1, 13.2, 16.2, 101.5 Annex EE	
2 (d) the insulation is suitable for foreseeable conditions	4, 6.7 Annex D, Annex K	
3. Protection against hazards which may be caused by external influences on the electrical equipment Technical measures shall be laid down in accordance with point 1, in order to ensure that the electrical equipment:		
3 (a) meets the expected mechanical requirements in such a way that persons, domestic animals and property are not endangered	4, 7, 8	
3 (b) is resistant to non-mechanical influences in expected environmental conditions, in such a way that persons, domestic animals and property are not endangered	1.4, 4, 6.7.2.2.1, 10.5, 11.6, 14.3, 14.8, 15	
3 (c) does not endanger persons, domestic animals and property in foreseeable conditions of overload	4, 9, 14, 16.1, 101 Annex EE	

WARNING 1 — Presumption of conformity stays valid only as long as a reference to this European standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

WARNING 2 — Other Union legislation may be applicable to the product(s) falling within the scope of this standard."

Documents
Document Sharing Hub
Full document details: BS EN IEC 61010-2-032:2021+A11:2021

© IEC 2020

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

_____

IEC 61010-2-032
Edition 4.0 2019-06

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

IEC 61010-2-032
Édition 4.0 2019-06

EXIGENCES DE SÉCURITÉ POUR APPAREILS ÉLECTRIQUES DE MESURAGE, DE RÉGULATION ET DE LABORATOIRE –

Partie 2-032: Exigences particulières pour les capteurs de courant, PORTATIFS et manipulés manuellement, pour essai électrique et mesurage

CORRIGENDUM 1

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.

Replace the content "≥ 30 ≥ 300" of the cell located in the first column, second row, with the following content: "≥ 30 ≤ 300".

Tableau 101 – DISTANCES D'ISOLEMENT et LIGNES DE FUITE des BORNES d'un circuit de mesure ayant des parties conductrices sous TENSION DANGEREUSE qui peuvent atteindre 1 000 V en courant alternatif ou 1 500 V en courant continu

Remplacer le contenu "≥ 30 ≥ 300" de la cellule située à la première colonne, deuxième ligne, par le contenu suivant: "≥ 30 ≤ 300".

Table K.105 – Minimum values for distance or thickness of solid insulation in measuring circuits RATED FOR MEASUREMENT CATEGORIES III and IV

Replace the title of Table K.105 with the following title:

Table K.105 – Minimum values for distance or thickness of solid insulation in measuring circuits RATED FOR MEASUREMENT CATEGORIES

Tableau K.105 – Valeurs minimales des distances ou de l'épaisseur de l'isolation solide dans les circuits de mesure dont les CATÉGORIES DE MESURES III et IV sont des CARACTÉRISTIQUES ASSIGNÉES

Remplacer le titre du Tableau K.105 par le titre suivant:

Tableau K.105 – Valeurs minimales des distances ou de l'épaisseur de l'isolation solide dans les circuits de mesure dont les CATÉGORIES DE MESURES sont des CARACTÉRISTIQUES ASSIGNÉES

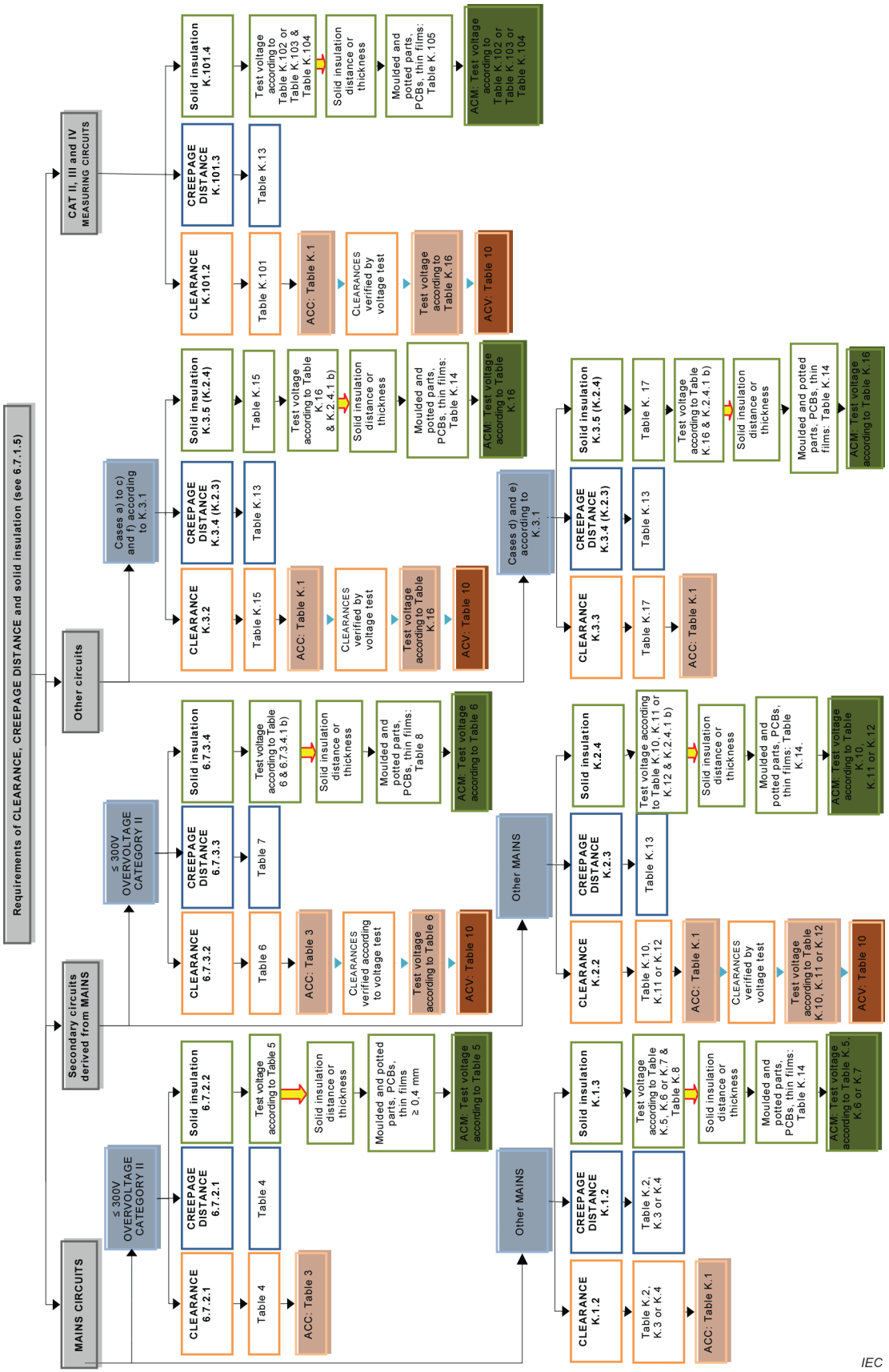
Figure DD.1 – Requirements for CLEARANCE, CREEPAGE DISTANCE and solid insulation

Figure DD.1 – Exigences relatives à la DISTANCE D'ISOLEMENT, à la LIGNE DE FUITE et à l'isolation solide

IEC 61010-2-032:2019-06/COR1:2020-02(en-fr)

Documents
Document Sharing Hub
Full document details: BS EN IEC 61010-2-032:2021+A11:2021

Replace in the last column on the right, 4th box, the text "Moulded and potted parts, PCBs, thin films: Table K.14" *with* "Moulded and potted parts, PCBs, thin films: Table K.105" *as follows:*



IEC
Documents
Document Sharing Hub
Full document details: BS EN IEC 61010-2-032:2021+A11:2021

Key

ACC	RATED altitude correction of CLEARANCE
ACV	Site altitude correction of test voltage
&	Both required
ACM	Alternative conformity means
	As applicable
	Optional test path

Figure DD.1 – Requirements for CLEARANCE, CREEPAGE DISTANCE and solid insulation

Documents
Document Sharing Hub
Full document details: BS EN IEC 61010-2-032:2021+A11:2021

CONTENTS

FOREWORD 4
INTRODUCTION 7
1 Scope and object 8
2 Normative references 10
3 Terms and definitions 10
4 Tests 11
5 Marking and documentation 12
6 Protection against electric shock 16
7 Protection against mechanical HAZARDS 21
8 Resistance to mechanical stresses 21
9 Protection against the spread of fire 25
10 Equipment temperature limits and resistance to heat 25
11 Protection against HAZARDS from fluids and solid foreign objects 26
12 Protection against radiation, including laser sources, and against sonic and ultrasonic pressure 26
13 Protection against liberated gases and substances, explosion and implosion 26
14 Components and subassemblies 27
15 Protection by interlocks 28
16 HAZARDS resulting from application 28
17 RISK assessment 28
Annexes 36
Annex D (normative) Parts between which insulation requirements are specified (see 6.4, 6.5.3, 6.9.101 and 6.101) 36
Annex F (normative) Routine tests 38
Annex K (normative) Insulation requirements not covered by 6.7 39
Annex L (informative) Index of defined terms 46
Annex AA (normative) MEASUREMENT CATEGORIES 47
Annex BB (informative) HAZARDS pertaining to measurements performed in certain environments 49
Annex CC (informative) 4-mm "banana" TERMINALS 52
Annex DD (informative) Flowchart for insulation according to the type of circuit 54
Annex EE (normative) CLAMP MULTIMETER 57
Bibliography 60

Figure 101 – Examples of current sensors and their parts 9
Figure 102 – CLEARANCE between the PROTECTIVE BARRIER to the JAWS and to the HAZARDOUS LIVE conductor 19
Figure 103 – Abrasion test of the JAW ENDS 22
Figure 104 – Impact points for JAW impact test 23
Figure 105 – Indentation device 24
Figure 106 – Test probe to check protection against short-circuits 34
Figure 107 – Use of the test probe of Figure 106 34

AVA Documents
Document Sharing Hub

Full document details: BS EN IEC 61010-2-032:2021+A11:2021

Figure D.101 – Parts of current sensors (see also Table D.101) 36
Figure AA.1 – Example to identify the locations of measuring circuits 48
Figure CC.1 – Recommended dimensions of 4-mm TERMINALS 53
Figure DD.1 – Requirements for CLEARANCE, CREEPAGE DISTANCE and solid insulation 56
Figure EE.1 – Examples of CLAMP MULTIMETERS 57

Table 1 – Symbols 12
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. 17
Table 102 – Energy level for JAW impact test 22
Table 103 – Pull forces for endcaps of flexible current sensors 25
Table 104 – Impulse voltages 28
Table 105 – Thickness of the test probe of Figure 106 and test voltages 35
Table D.101 – Insulation requirements for current sensors 37
Table K.101 – CLEARANCES of measuring circuits RATED for MEASUREMENT CATEGORIES 40
Table K.102 – a.c. test voltages for testing electric strength of solid insulation in measuring circuits RATED for MEASUREMENT CATEGORIES 41
Table K.103 – Impulse test voltages for testing electric strength of solid insulation in measuring circuits RATED for MEASUREMENT CATEGORIES 42
Table K.104 –Test voltages for testing long-term stress of solid insulation in measuring circuits RATED for MEASUREMENT CATEGORIES 43
Table K.105 – Minimum values for distance or thickness of solid insulation in measuring circuits RATED FOR MEASUREMENT CATEGORIES III and IV 44
Table AA.1 – Characteristics of MEASUREMENT CATEGORIES 48

Documents
Document Sharing Hub
Full document details: BS EN IEC 61010-2-032:2021+A11:2021

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

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

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of 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, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). 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. 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 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 IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61010-2-032 has been prepared by IEC technical committee 66: Safety of measuring, control and laboratory equipment.

This fourth edition cancels and replaces the third 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) It has been indicated that current sensors used as FIXED EQUIPMENT are not within the scope of this document.
b) Fork-style current sensors have been added.

AVA Documents Document Sharing Hub

Full document details: BS EN IEC 61010-2-032:2021+A11:2021

c) Requirements from Part 2-033 applicable to CLAMP MULTIMETERS that have a primary purpose of measuring voltage on live MAINS have been included in the new normative Annex EE.

d) CLEARANCES and CREEPAGE DISTANCES for measuring circuit TERMINALS exceeding 1 000 V a.c. or 1 414 V d.c. and for WET LOCATIONS have been specified.

e) Reduced CREEPAGE DISTANCES are allowed to be according to material group I for all insulating materials.

f) Requirements for input/output circuits of Type A, Type B and Type C current sensors have been detailed in 6.9.102.

g) Requirements for output circuit leads have been modified.

h) The JAW impact test has been limited to the front of the JAWS.

i) The abrasion test for cords of flexible current sensors has been removed and replaced by a pressure test at high temperature.

j) The voltage source for testing overvoltage limiting components or circuits may be limited to 400 V.

k) Reference to IEC 61010-031 for probe assemblies has been added.

l) Requirements for the prevention of TRANSIENT OVERVOLTAGES for MAINS voltage measuring circuits have been added.

m) Requirements for measuring circuits from 1 000 V to 3 000 V have been added.

n) An informative Annex CC about the dimensions of banana TERMINALS has been added.

o) A flowchart for insulation according to the type of circuit has been added in a new Annex DD.

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

FDIS	Report on voting
66/691/FDIS	66/695/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 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 Part 2-032 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 2-032 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 and hand-manipulated current sensors for electrical test and measurement.*

Where a particular subclause of Part 1 is not mentioned in this Part 2-032, that subclause applies as far as is reasonable. Where this Part 2-032 states "addition", "modification", "replacement", or "deletion" the relevant requirement, test specification or note in Part 1 should be adapted accordingly.

Documents
Document Sharing Hub
Full document details: BS EN IEC 61010-2-032:2021+A11:2021

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).

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://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.

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.

Documents
Document Sharing Hub

Full document details: BS EN IEC 61010-2-032:2021+A11:2021

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 2-032. Equipment within the scopes of both Part 2-030 and Part 2-032 are considered to be covered by the requirements of this Part 2-032.

Part 2-033 specifies the safety requirements for hand-held multimeters that have the primary purpose of measuring voltage on live MAINS. For equipment within the scope of Part 2-032 and Part 2-033, only this 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 2-032 and Part 2-034, both documents should be read in conjunction.

Documents
Document Sharing Hub

Full document details: BS EN IEC 61010-2-032:2021+A11:2021

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

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 and hand-manipulated current sensors described below.

These current sensors are for measuring, detecting or injecting current, or indicating current waveforms on circuits without physically opening the current path of the circuit being measured. They can be stand-alone current sensors or accessories to other equipment or parts of combined equipment (see Figure 101). These include measurement circuits which are part of electrical test and measurement equipment, laboratory equipment, or process control equipment. These current sensors and circuits need additional protective means between the current sensor, the circuit and an OPERATOR.

NOTE 1 Combined equipment is equipment that is electrically connected to a current sensor by means of a permanent connection which can be detached only by the use of a TOOL.

NOTE 2 Some current sensors are also known as current clamps, CLAMP MULTIMETERS and current probes.

Current sensors are hand-manipulated before and/or after a test or measurement, but do not necessarily need to be HAND-HELD during the test or measurement. Current sensors used as FIXED EQUIPMENT are not within the scope of this document.

The following types of current sensors are covered:

a) Type A: a current sensor designed to be applied to or removed from HAZARDOUS LIVE UNINSULATED CONDUCTORS. Type A current sensors have defined HAND-HELD or hand-manipulated parts providing protection against electric shock from the conductor being measured, and also have protection against short-circuits between wires and between busbars during clamping.

b) Type B: a current sensor which has protection against short-circuits between wires or busbars during clamping but without defined HAND-HELD or hand-manipulated parts which provide protection against electric shock during clamping. Additional protective means are necessary to avoid electric shock from HAZARDOUS LIVE conductors which cannot be de-energised during application or removal of the current sensor.

EXAMPLE 1 Flexible current sensors.

c) Type C: a current sensor without protection against short-circuits between wires or busbars during clamping. Type C current sensors are intended to be applied to or removed from HAZARDOUS LIVE UNINSULATED CONDUCTORS or from non-limited-energy circuit conductors only when they are de-energised.

EXAMPLE 2 Split-core transducers.

d) Type D: a current sensor designed to be applied to or removed from insulated conductors or from limited-energy circuit conductors.

AVA Documents Document Sharing Hub

Full document details: BS EN IEC 61010-2-032:2021+A11:2021