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GROUP SAFETY PUBLICATION

**Safety requirements for electrical equipment for measurement, control, and laboratory use –
Part 2-034: Particular requirements for measurement equipment for insulation resistance and test equipment for electric strength**

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

Part 1: General requirements

INTERPRETATION SHEET 1

This interpretation sheet has been prepared by IEC technical committee 66: Safety of measuring, control and laboratory equipment.

The text of this interpretation sheet is based on the following documents:

ISH	Report on voting
66/497A/ISH	66/505/RVD

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

IEC 61010-1:2010 contains a requirement in 6.8.3.1 pertaining to voltage testers for type tests as follows:

“The generator shall be able to supply a power of at least 500 VA.”

This has given rise to the following questions:

How does one interpret the requirement for voltage testers in 6.8.3.1 of IEC 61010-1:2010? Specifically, this subclause requires that “The generator shall be able to supply a power of at least 500 VA.” Does this requirement apply throughout the rated output range of the voltage tester? What is meant by the word “generator”? Is the “generator” the power supply within the voltage tester, or the voltage tester output, or something else?

Interpretation:

“A voltage tester used for type tests must be able to deliver at least 500 VA at its full-rated output voltage. It does not necessarily need to deliver 500 VA if set for lower voltages.

For example, a voltage tester that can deliver 100 mA at any test output voltage up to 5 000 V (and a current corresponding to 500 VA above 5 000 V) would meet the requirement.

The requirements for voltage testers used for routine (production line) tests are included in Annex F. The requirements of 6.8.3.1 do not apply to these voltage testers.”

CONTENTS

FOREWORD.....	11
INTRODUCTION to IEC 61010-1:2010 and IEC 61010 1:2010/AMD1:2016.....	15
INTRODUCTION.....	16
1 Scope and object.....	17
1.1 Scope.....	17
1.1.1 Equipment included in scope	17
1.1.2 Equipment excluded from scope	17
1.1.3 Computing equipment.....	18
1.2 Object	18
1.2.1 Aspects included in scope	18
1.2.2 Aspects excluded from scope	18
1.3 Verification	18
1.4 Environmental conditions	19
1.4.1 Normal environmental conditions	19
1.4.2 Extended environmental conditions	19
2 Normative references	19
3 Terms and definitions	22
3.1 Equipment and states of equipment.....	22
3.2 Parts and accessories	22
3.3 Quantities.....	23
3.4 Tests.....	23
3.5 Safety terms.....	24
3.6 Insulation	25
4 Tests	27
4.1 General	27
4.2 Sequence of tests.....	27
4.3 Reference test conditions	27
4.3.1 Environmental conditions.....	27
4.3.2 State of equipment	28
4.4 Testing in SINGLE FAULT CONDITION	29
4.4.1 General	29
4.4.2 Application of fault conditions	30
4.4.3 Duration of tests	32
4.4.4 Conformity after application of fault conditions.....	32
5 Marking and documentation.....	33
5.1 Marking	33
5.1.1 General	33
5.1.2 Identification.....	33
5.1.3 MAINS supply	34
5.1.4 Fuses	35
5.1.5 TERMINALS, connections and operating devices.....	36
5.1.6 Switches and circuit-breakers	38
5.1.7 Equipment protected by DOUBLE INSULATION or REINFORCED INSULATION.....	38
5.1.8 Field-wiring TERMINAL boxes	38
5.2 Warning markings	39

5.3	Durability of markings	39
5.4	Documentation	39
5.4.1	General	39
5.4.2	Equipment RATINGS	40
5.4.3	Equipment installation	41
5.4.4	Equipment operation	41
5.4.5	Equipment maintenance and service	42
5.4.6	Integration into systems or effects resulting from special conditions	43
5.101	HAZARD indicator	43
5.101.1	General	43
5.101.2	HAZARD indicator light for fixed equipment	43
6	Protection against electric shock	44
6.1	General	44
6.1.1	Requirements	44
6.1.2	Exceptions	44
6.2	Determination of ACCESSIBLE parts	44
6.2.1	General	44
6.2.2	Examination	45
6.2.3	Openings above parts that are HAZARDOUS LIVE	45
6.2.4	Openings for pre-set controls	45
6.3	Limit values for ACCESSIBLE parts	46
6.3.1	Levels in NORMAL CONDITION	46
6.3.2	Levels in SINGLE FAULT CONDITION	46
6.4	Primary means of protection	49
6.4.1	General	49
6.4.2	ENCLOSURES and PROTECTIVE BARRIERS	49
6.4.3	BASIC INSULATION	49
6.4.4	Impedance	49
6.5	Additional means of protection in case of SINGLE FAULT CONDITIONS	49
6.5.1	General	49
6.5.2	PROTECTIVE BONDING	50
6.5.3	SUPPLEMENTARY INSULATION and REINFORCED INSULATION	54
6.5.4	PROTECTIVE IMPEDANCE	55
6.5.5	Automatic disconnection of the supply	55
6.5.6	Current- or voltage-limiting device	55
6.6	Connections to external circuits	56
6.6.1	General	56
6.6.2	TERMINALS for external circuits	56
6.6.3	Circuits with TERMINALS which are HAZARDOUS LIVE	56
6.6.4	TERMINALS for stranded conductors	56
6.6.101	Measuring circuit TERMINALS	57
6.7	Insulation requirements	59
6.7.1	The nature of insulation	59
6.7.2	Insulation for MAINS CIRCUITS of OVERVOLTAGE CATEGORY II with a nominal supply voltage up to 300 V	62
6.7.3	Insulation for secondary circuits derived from MAINS CIRCUITS of OVERVOLTAGE CATEGORY II up to 300 V	65
6.8	Procedure for voltage tests	71
6.8.1	General	71

6.8.2	Humidity preconditioning	72
6.8.3	Test procedures	73
6.9	Constructional requirements for protection against electric shock	74
6.9.1	General	74
6.9.2	Insulating materials	74
6.9.3	Colour coding	74
6.10	Connection to the MAINS supply source and connections between parts of equipment	74
6.10.1	MAINS supply cords	74
6.10.2	Fitting of non-detachable MAINS supply cords	75
6.10.3	Plugs and connectors	77
6.11	Disconnection from supply source	77
6.11.1	General	77
6.11.2	Exceptions	77
6.11.3	Requirements according to type of equipment	78
6.11.4	Disconnecting devices	78
6.101	Protection against HAZARDOUS LIVE outputs	79
6.101.1	Insulation between MAINS CIRCUITS and output circuits	79
6.101.2	Protection against unintended energising of the outputs	79
6.101.3	Protection against automatic energising of the outputs	79
6.102	Discharging residual voltages	80
6.102.1	General	80
6.102.2	d.c. voltage tests	80
6.102.3	a.c. voltage tests	80
7	Protection against mechanical HAZARDS	81
7.1	General	81
7.2	Sharp edges	81
7.3	Moving parts	81
7.3.1	General	81
7.3.2	Exceptions	82
7.3.3	RISK assessment for mechanical HAZARDS to body parts	82
7.3.4	Limitation of force and pressure	83
7.3.5	Gap limitations between moving parts	84
7.4	Stability	86
7.5	Provisions for lifting and carrying	87
7.5.1	General	87
7.5.2	Handles and grips	87
7.5.3	Lifting devices and supporting parts	87
7.6	Wall mounting	87
7.7	Expelled parts	88
8	Resistance to mechanical stresses	88
8.1	General	88
8.2	ENCLOSURE rigidity tests	89
8.2.1	Static test	89
8.2.2	Impact test	89
8.3	Drop test	90
8.3.1	Equipment other than HAND-HELD EQUIPMENT and DIRECT PLUG-IN EQUIPMENT	90
8.3.2	HAND-HELD EQUIPMENT and DIRECT PLUG-IN EQUIPMENT	91

9	Protection against the spread of fire	91
9.1	General	91
9.2	Eliminating or reducing the sources of ignition within the equipment.....	93
9.3	Containment of fire within the equipment, should it occur	93
9.3.1	General	93
9.3.2	Constructional requirements	93
9.4	Limited-energy circuit	96
9.5	Requirements for equipment containing or using flammable liquids	97
9.6	Overcurrent protection.....	97
9.6.1	General	97
9.6.2	PERMANENTLY CONNECTED EQUIPMENT	98
9.6.3	Other equipment.....	98
9.101	Protection of measuring circuits.....	98
9.101.1	General	98
9.101.2	Protection against mismatches of inputs and ranges.....	99
9.101.3	Protection against MAINS overvoltages	101
9.101.4	Protection against extraneous voltages from distribution system.....	102
9.101.5	Protection against currents and voltages induced by the environment	102
10	Equipment temperature limits and resistance to heat.....	104
10.1	Surface temperature limits for protection against burns	104
10.2	Temperatures of windings	105
10.3	Other temperature measurements	105
10.4	Conduct of temperature tests	105
10.4.1	General	105
10.4.2	Temperature measurement of heating equipment	106
10.4.3	Equipment intended for installation in a cabinet or a wall.....	106
10.5	Resistance to heat.....	106
10.5.1	Integrity of CLEARANCES and CREEPAGE DISTANCES.....	106
10.5.2	Non-metallic ENCLOSURES	106
10.5.3	Insulating material	107
11	Protection against HAZARDS from fluids and solid foreign objects	108
11.1	General	108
11.2	Cleaning.....	108
11.3	Spillage.....	108
11.4	Overflow.....	108
11.5	Battery electrolyte	109
11.6	Equipment RATED with a degree of ingress protection (IP code).....	109
11.6.1	General	109
11.6.2	Conditions for testing.....	109
11.6.3	Protection against solid foreign objects (including dust).....	110
11.6.4	Protection against water	110
11.7	Fluid pressure and leakage	110
11.7.1	Maximum pressure	110
11.7.2	Leakage and rupture at high pressure	111
11.7.3	Leakage from low-pressure parts.....	112
11.7.4	Overpressure safety device	112
12	Protection against radiation, including laser sources, and against sonic and ultrasonic pressure	113
12.1	General	113

12.2	Equipment producing ionizing radiation	113
12.2.1	Ionizing radiation	113
12.2.2	Accelerated electrons	114
12.3	Optical radiation	114
12.4	Microwave radiation	115
12.5	Sonic and ultrasonic pressure	115
12.5.1	Sound level	115
12.5.2	Ultrasonic pressure.....	116
12.6	Laser sources.....	116
13	Protection against liberated gases and substances, explosion and implosion	117
13.1	Poisonous and injurious gases and substances	117
13.2	Explosion and implosion	117
13.2.1	Components	117
13.2.2	Batteries and battery charging	117
13.2.3	Implosion of cathode ray tubes	118
14	Components and subassemblies	118
14.1	General	118
14.2	Motors	119
14.2.1	Motor temperatures	119
14.2.2	Series excitation motors	119
14.3	Overtemperature protection devices	120
14.4	Fuse holders	120
14.5	MAINS voltage selection devices	120
14.6	MAINS transformers tested outside equipment.....	120
14.7	Printed wiring boards.....	121
14.8	Circuits used to limit TRANSIENT OVERVOLTAGES.....	121
14.101	Probe assemblies and accessories	121
15	Protection by interlocks	122
15.1	General	122
15.2	Prevention of reactivating	122
15.3	Reliability	122
16	HAZARDS resulting from application	122
16.1	REASONABLY FORESEEABLE MISUSE	122
16.2	Ergonomic aspects	122
17	RISK assessment	123
101	Measuring circuits	123
101.1	General	123
101.2	Current measuring circuits.....	124
101.3	Indicating devices.....	124
101.3.1	General	124
101.3.2	Battery level	124
101.3.3	Over-range indication	125
101.3.4	Permanent overvoltages	125
Annex A (normative)	Measuring circuits for touch current (see 6.3).....	127
Annex B (normative)	Standard test fingers (see 6.2)	130
Annex C (normative)	Measurement of CLEARANCES and CREEPAGE DISTANCES	132
Annex D (normative)	Parts between which insulation requirements are specified (see 6.4 and 6.5.3)	136

Annex E (informative) Guideline for reduction of POLLUTION DEGREES	139
Annex F (normative) ROUTINE TESTS.....	140
Annex G (informative) Leakage and rupture from fluids under pressure	142
Annex H (normative) Qualification of conformal coatings for protection against POLLUTION	147
Annex I (informative) Line-to-neutral voltages for common MAINS supply systems	150
Annex J (informative) RISK assessment	152
Annex K (normative) Insulation requirements not covered by 6.7	155
Annex L (informative) Index of defined terms	184
Annex AA (normative) Measurement categories	186
Annex BB (informative) HAZARDS pertaining to measurements performed in certain environments	189
Annex CC (informative) 4 mm "banana" TERMINALS	192
Annex DD (informative) Flowchart for insulation according to the type of circuit.....	194
Annex EE (informative) Determination of CLEARANCES for Table 101	197
Bibliography.....	198
Figure 1 – Measurements through openings in ENCLOSURES.....	45
Figure 2 – Maximum duration of short-term ACCESSIBLE voltages in SINGLE FAULT CONDITION (see 6.3.2 a))	47
Figure 3 – Capacitance level versus voltage in NORMAL CONDITION and SINGLE FAULT CONDITION (see 6.3.1 c) and 6.3.2 c))	48
Figure 4 – Acceptable arrangement of protective means against electric shock	50
Figure 5 – Examples of binding screw assemblies	52
Figure 101 – Duration of current flow versus body current for a.c. and d.c. currents.....	54
Figure 6 – Distance between conductors on an interface between two layers.....	64
Figure 7 – Distance between adjacent conductors along an interface of two inner layers.....	64
Figure 8 – Distance between adjacent conductors located between the same two layers.....	65
Figure 9 – Detachable MAINS supply cords and connections	75
Figure 10 – Impact test using a sphere	90
Figure 11 – Flow chart to explain the requirements for protection against the spread of fire	92
Figure 12 – Baffle	95
Figure 13 – Area of the bottom of an ENCLOSURE to be constructed as specified in 9.3.2 c) 1).....	95
Figure 102 – Test circuit for induced voltage and current	103
Figure 14 – Ball-pressure test apparatus.....	107
Figure 16 – Ratio between test pressure and maximum working pressure.....	112
Figure 15 – Flow chart for conformity options 14.1 a), b), c) and d).....	119
Figure A.1 – Measuring circuit for a.c. with frequencies up to 1 MHz and for d.c.	127
Figure A.2 – Measuring circuits for sinusoidal a.c. with frequencies up to 100 Hz and for d.c.	128
Figure A.3 – Current measuring circuit for electrical burns	129
Figure A.4 – Current measuring circuit for wet contact	129

Figure B.1 – Rigid test finger	130
Figure B.2 – Jointed test finger	131
Figure C.1 – Examples of methods of measuring CLEARANCES and CREEPAGE DISTANCES	135
Figures D.1a) to d) – Protection between HAZARDOUS LIVE circuits and ACCESSIBLE parts	137
Figures D.1e) to h) – Protection between HAZARDOUS LIVE circuits and circuits with ACCESSIBLE external TERMINALS	137
Figures D.2 a) and D.2 b) – Protection between a HAZARDOUS LIVE internal circuit and an ACCESSIBLE part which is not bonded to other ACCESSIBLE parts	138
Figures D.2 c) and D.2 d) – Protection between a HAZARDOUS LIVE primary circuit and circuits which have ACCESSIBLE external TERMINALS	138
Figure D.3 – Protection of external ACCESSIBLE TERMINALS of two HAZARDOUS LIVE circuits	138
Figure G.1 – Conformity verification process (see G.2)	143
Figure H.1 – Test sequence and conformity	149
Figure J.1 – Iterative process of RISK assessment and RISK reduction	152
Figure J.2 – RISK reduction	153
Figure K.1 – Distance between conductors on an interface between two layers	159
Figure K.2 – Distance between adjacent conductors along an interface of an inner layer	160
Figure K.3 – Distance between adjacent conductors located between the same two layers	161
Figure K.4 – Example of recurring peak voltage	173
Figure K.101 – Circuit with protective screen	175
Figure K.102 – Circuit with DOUBLE INSULATION	176
Figure K.103 – Test circuit for evaluation of TRANSIENT OVERVOLTAGE attenuation	178
Figure AA.1 – Example to identify the locations of MEASUREMENT CATEGORIES	187
Figure CC.1 – Recommended dimensions of 4 mm TERMINALS	193
Figure DD.1 – Requirements for CLEARANCE, CREEPAGE DISTANCE and solid insulation	196
Table 1 – Symbols	35
Table 2 – Tightening torque for binding screw assemblies	52
Table 101 – CLEARANCES for unmated measuring circuit TERMINALS	58
Table 3 – Multiplication factors for CLEARANCES of equipment RATED for operation at altitudes up to 5 000 m	60
TABLE 4 – CLEARANCES and CREEPAGE DISTANCES for MAINS CIRCUITS of OVERVOLTAGE CATEGORY II up to 300 V	62
Table 5 – Test voltages for solid insulation in MAINS CIRCUITS of OVERVOLTAGE CATEGORY II up to 300 V	63
Table 6 – CLEARANCES and test voltages for secondary circuits derived from MAINS CIRCUITS of OVERVOLTAGE CATEGORY II up to 300 V	66
Table 7 – CREEPAGE DISTANCES for secondary circuits	68
Table 8 – Minimum values for distance or thickness (see 6.7.3.4.2 to 6.7.3.4.4)	70
Table 9 – Distances between TERMINALS and foil	71
Table 10 – Correction factors according to test site altitude for test voltages for CLEARANCES	72
Table 11 – Values for physical tests on cord anchorages	76

Table 12 – Protective measures against mechanical HAZARDS to body parts.....	83
Table 13 – Minimum maintained gaps to prevent crushing for different body parts	85
Table 14 – Maximum gaps to prevent access for different body parts.....	86
Table 15 – Impact energy levels, test height and corresponding IK codes	90
Table 16 – Acceptable perforation of the bottom of an ENCLOSURE	94
Table 17 – Limits of maximum available current.....	96
Table 18 – Values for overcurrent protection devices	97
Table 19 – Surface temperature limits in NORMAL CONDITION.....	104
Table 20 – Maximum temperatures for insulation material of windings	105
Table 22 – Lamp or lamp systems considered photobiologically safe	115
Table 23 – Lamp or lamp systems considered photobiologically safe under certain conditions	115
Table 21 – Impulse voltages for OVERVOLTAGECATEGORY II.....	121
Table C.1 – Dimensions of X.....	132
Table E.1 – Environmental situations	139
Table E.2 – Reduction of POLLUTION DEGREES	139
Table F.1 – Test voltages for ROUTINE TESTS of MAINS CIRCUITS	141
Table G.1 – Test pressures for equipment with pressures above 14 Mpa	145
Table H.1 – Test parameters, test conditions and test procedures	148
Table I.1 – Line-to-neutral voltages for common MAINS supply systems	150
Table J.1 – Severity of harm	154
Table J.2 – Probability of harm	154
Table J.3 – Risk category	154
Table K.1 – Multiplication factors for CLEARANCES for equipment RATED for operation at altitudes up to 5 000 m	156
Table K.2 – CLEARANCES and CREEPAGE DISTANCES for MAINS CIRCUITS of OVERVOLTAGE CATEGORY II above 300 V	156
Table K.3 – CLEARANCES and CREEPAGE DISTANCES for MAINS CIRCUITS of OVERVOLTAGE CATEGORY III	157
Table K.4 – CLEARANCES and CREEPAGE DISTANCES for MAINS CIRCUITS of OVERVOLTAGE CATEGORY IV	157
Table K.5 – Test voltages for solid insulation in MAINS CIRCUITS of OVERVOLTAGE CATEGORY II above 300 V	158
Table K.6 – Test voltages for solid insulation in MAINS CIRCUITS of OVERVOLTAGE CATEGORY III	158
Table K.7 – Test voltages for solid insulation in MAINS CIRCUITS of OVERVOLTAGE CATEGORY IV	158
Table K.8 – Test voltages for testing long-term stress of solid insulation in MAINS CIRCUITS.....	159
Table K.9 – Minimum values for distance or thickness of solid insulation	160
Table K.10 – CLEARANCES and test voltages for secondary circuits derived from MAINS CIRCUITS of OVERVOLTAGE CATEGORY II above 300 V	163
Table K.11 – CLEARANCES and test voltages for secondary circuits derived from MAINS CIRCUITS of OVERVOLTAGE CATEGORY III.....	164
Table K.12 – CLEARANCES and test voltages for secondary circuits derived from MAINS CIRCUITS of OVERVOLTAGE CATEGORY IV	165
Table K.13 – CREEPAGE DISTANCES for secondary circuits.....	166

Table K.14 – Minimum values for distance or thickness (see K.2.4.2 to K.2.4.4)	168
Table K.15 – CLEARANCE values for the calculation of K.3.2	171
Table K.16 – Test voltages based on CLEARANCES	171
Table K.17 – CLEARANCES for BASIC INSULATION in circuits having recurring peak voltages or WORKING VOLTAGES with frequencies above 30 kHz	174
Table K.101 – Impulse voltages for circuits connected to MAINS	178
Table K.102 – CLEARANCES for measuring circuits RATED for MEASUREMENT CATEGORIES	180
Table K.103 – Impulse test voltages for testing electric strength of solid insulation for measuring circuits RATED for MEASUREMENT CATEGORIES	181
Table K.104 – a.c. test voltages for testing electric strength of solid insulation for measuring circuits rated for measurement categories	181
Table K.105 – Minimum values for distance or thickness of solid insulation for measuring circuits RATED for MEASUREMENT CATEGORIES	182
Table AA.1 – Characteristics of MEASUREMENT CATEGORIES	188
Table EE.1 – CLEARANCES values for Table 101	197

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 2-034: Particular requirements for measurement equipment for insulation resistance and test equipment for electric strength

FOREWORD

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IEC 61010-2-034:2023 EXV includes the content of IEC 61010-2-034:2023, and the references made to IEC 61010-1:2010 and IEC 61010-1:2010/AMD1:2016.

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

This second edition cancels and replaces the first edition published in 2017. This edition constitutes a technical revision.

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

- a) in 1.2.1, requirements for protection against HAZARDS which could occur from reading a voltage have been added to the scope;
- b) Clause 2, all normative references have been dated; new normative references have been added;
- c) in 4.3.2.5, requirements for power supply have been modified;
- d) in 4.3.2.6, requirements for inputs/outputs have been modified;
- e) in 5.1.5.101.2, minimum RATINGS for voltage of measuring TERMINALS are required;
- f) in 5.4.2, new RATINGS for documentation have been added;
- g) in 5.4.4, new instructions for operation have been added;
- h) in 5.101.1, HAZARD indicators shall be functional in NORMAL CONDITION and in SINGLE FAULT CONDITION;
- i) in 6.6.101.1, insulating material of group I may be allowed for determination of CREEPAGE DISTANCES of measuring circuit TERMINALS;
- j) in 6.6.101.2, CLEARANCES and CREEPAGE DISTANCES above 1 000 V a.c. and 1 500 V d.c. for measuring circuit TERMINALS in unmated position have been defined;
- k) in 6.6.101.3, requirements for measuring circuit TERMINALS in partially mated position have been specified;
- l) in 6.6.101.4, requirements for measuring circuit TERMINALS in mated position have been specified;
- m) Subclause 6.102 replaces 6.9.103 and has been rephrased;
- n) new Subclause 9.101 to consider the protection of measuring circuits against the spread of fire and arc flash has been added. Table 102 has been replaced by Table K.101;
- o) In 9.101.2, relocation of 101.3 of previous edition;
- p) In 9.101.3, relocation of 101.4 of previous edition, extension to MEASUREMENT CATEGORY II and reference to IEC 61000-4-5 for tests;
- q) in 9.101.4, requirements for measuring circuit TERMINALS in mated position have been specified;
- r) in 9.101.5, relocation of K.103 of previous edition with numerous technical changes;
- s) in 14.101, relocation of 14.102. 14.101 of previous edition has been removed;
- t) in 101.3, relocation of 101.5 of previous edition, and more requirements added against HAZARD occurring from reading a voltage value;
- u) in K.2.1, another method for determination of CLEARANCES of secondary circuits is proposed;
- v) in K.3.2, new Table K.15 and Table K.16 for CLEARANCE calculation;
- w) in K.3.101, relocation of 6.9.104 of previous edition;
- x) in K.101.4.1, new Table K.103 and Table K.104 replace Table K.102, Table K.103 and Table K.104;
- y) in K.101.4, the subclause has been reviewed. Tables and tests for solid insulation have been modified. Table K.105 replaces Table K.9;

- z) Table K.101, replacement of Table K.106;
- aa) Clause K.4, redraft of the clause to propose a method for determination of U_t for circuits which reduce TRANSIENT OVERVOLTAGE;
- bb) Annex EE: addition of a new informative annex for determination of CLEARANCES for Table 101.

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

Draft	Report on voting
66/778/FDIS	66/784/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 measurement equipment for insulation resistance and test equipment for electric strength*.

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:

- the following print types are used:
 - requirements: in roman type;
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 - terms used throughout this standard which have been defined in Clause 3: SMALL ROMAN CAPITALS;
- 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).

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- amended.

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INTRODUCTION to IEC 61010-1:2010 and IEC 61010 1:2010/AMD1:2016

This International Standard specifies the safety requirements that are generally applicable to all equipment within its scope. For certain types of equipment, these requirements will be supplemented or modified by the special requirements of one, or more than one, particular part 2 of the standard which must be read in conjunction with the part 1 requirements.

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 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 specifies the safety requirements for hand-held and hand-manipulated current sensors for measuring, detecting or 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 have been included in IEC 61010-2-032. Equipment within the scopes of both IEC 61010-2-030 and IEC 61010-2-032 are considered to be covered by the requirements of IEC 61010-2-032.

However, for current sensors in combined equipment with protective bonding and automatic disconnection of the supply, IEC 61010-2-030 and IEC 61010-2-032 are read in conjunction.

- 3) IEC 61010-2-033 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 have been included in IEC 61010-2-033.

- 4) This document 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 have been included in this document. However, for equipment within the scope of IEC 61010-2-032 and of this document, 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, IEC 61010-2-033 and this document. 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 2-034: Particular requirements for measurement equipment for insulation resistance and test equipment for electric strength

1 Scope and object

1.1 Scope

1.1.1 Equipment included in scope

This document specifies safety requirements to equipment for measuring insulation resistance and to equipment for testing electric strength which have an output voltage exceeding 50 V a.c. or 120 V d.c.

This document also applies to combined measuring equipment which has an insulation resistance measurement function or an electric strength test measurement function.

This group safety publication focusing on safety essential requirements is primarily intended to be used as a product safety standard for the products mentioned in the scope, but is also intended to be used by technical committees in the preparation of publications for products similar to those mentioned in the scope of this document, in accordance with the principles laid down in IEC Guide 104 and ISO/IEC Guide 51.

One of the responsibilities of a technical committee is, wherever applicable, to make use of basic safety publications and/or group safety publications in the preparation of its publications.

1.1.2 Equipment excluded from scope

This standard does not apply to equipment within the scope of:

- a) IEC 60065 (Audio, video and similar electronic apparatus);
- b) IEC 60204 (Safety of machinery – Electrical equipment of machines);
- c) IEC 60335 (Household and similar electrical appliances);
- d) IEC 60364 (Electrical installations of buildings);
- e) IEC 60439 (Low-voltage switchgear and controlgear assemblies);
- f) IEC 60601 (Medical electrical equipment);
- g) IEC 60950 (Information technology equipment including electrical business equipment, except as specified in 1.1.3);
- h) IEC 61558 (Power transformers, power supply units and similar);
- i) IEC 61010-031 (Hand-held probe assemblies);
- j) IEC 61243-3 (Live working – Voltage detectors – Part 3: Two-pole low-voltage type).
- aa) IEC 61557-8 (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 – Part 8: Insulation monitoring devices for IT systems);
- bb) IEC 61557-9 (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 – Part 9: Equipment for insulation fault location in IT systems).

1.1.3 Computing equipment

This standard applies only to computers, processors, etc. which form part of equipment within the scope of this standard or are designed for use exclusively with the equipment.

NOTE Computing devices and similar equipment within the scope of IEC 60950 and conforming to its requirements are considered to be suitable for use with equipment within the scope of this standard. However, some of the requirements of IEC 60950 for resistance to moisture and liquids are less stringent than those in this standard (see 5.4.4 second paragraph).

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 HAZARD are given in Clauses 6 to 13, as follows:

- a) electric shock or burn (see Clause 6);
- b) mechanical HAZARDS (see Clauses 7 and 8);
- c) spread of fire or arc flash from the equipment (see Clause 9);
- d) excessive temperature (see Clause 10);
- e) effects of fluids and fluid pressure (see Clause 11);
- f) effects of radiation, including lasers sources, and sonic and ultrasonic pressure (see Clause 12);
- g) liberated gases, explosion and implosion (see Clause 13).

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.

RISK assessment for HAZARDS or environments not fully covered above is specified in Clause 17.

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

1.2.2 Aspects excluded from scope

This standard does not cover:

- cc) reliable function, performance, or other properties of the equipment not related to safety;
- dd) effectiveness of transport packaging;
- ee) EMC requirements (see the IEC 61326 series);
- ff) protective measures for explosive atmospheres (see the IEC 60079 series).

1.3 Verification

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

1.4 Environmental conditions

1.4.1 Normal environmental conditions

This standard applies to equipment designed to be safe at least under the following conditions:

- a) indoor use;
- b) altitude up to 2 000 m;
- c) temperature 5 °C to 40 °C;
- d) maximum relative humidity 80 % for temperatures up to 31 °C decreasing linearly to 50 % relative humidity at 40 °C;
- e) MAINS supply voltage fluctuations up to ± 10 % of the nominal voltage;
- f) TRANSIENT OVERVOLTAGES up to the levels of OVERVOLTAGE CATEGORY II;
NOTE 1 These levels of transient overvoltage are typical for equipment supplied from the building wiring.
- g) TEMPORARY OVERVOLTAGES occurring on the MAINS supply.
- h) applicable POLLUTION DEGREE of the intended environment (POLLUTION DEGREE 2 in most cases).

NOTE 2 Manufacturers may specify more restricted environmental conditions for operation; nevertheless the equipment must be safe within these normal environmental conditions.

1.4.2 Extended environmental conditions

This standard applies to equipment 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 equipment:

- a) outdoor use;
- b) altitude above 2 000 m;
- c) ambient temperatures below 5 °C or above 40 °C;
- d) relative humidity above the levels specified in 1.4.1;
- e) MAINS supply voltage fluctuations exceeding ± 10 % of the nominal voltage;
- f) WET LOCATION;
- g) TRANSIENT OVERVOLTAGES up to the levels of OVERVOLTAGE CATEGORY III or IV (see Annex K).

2 Normative references

The following referenced documents, where applicable, are indispensable for the application of this document. 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), *Letter symbols to be used in electrical technology*

IEC 60065, *Audio, video and similar electronic apparatus – Safety requirements*

IEC 60068-2-14, *Environmental testing – Part 2-14: Tests – Test N: Change of temperature*

IEC 60068-2-75, *Environmental testing – Part 2-75: Tests – Test Eh: Hammer tests*

IEC 60073, *Basic and safety principles for man-machine interface, marking and identification – Coding principles for indicators and actuators*

IEC 60227 (all parts), *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V*

IEC 60245 (all parts), *Rubber insulated cables – Rated voltages up to and including 450/750 V*

IEC 60309 (all parts), *Plugs, socket-outlets and couplers for industrial purposes*

IEC 60320 (all parts), *Appliance couplers for household and similar general purposes*

IEC 60332-1-2, *Tests on electric and optical fibre cables under fire conditions – Part 1-2: Test for vertical flame propagation for a single insulated wire or cable – Procedure for 1 kW pre-mixed flame*

IEC 60332-2-2, *Tests on electric and optical fibre cables under fire conditions – Part 2-2: Test for vertical flame propagation for a single small insulated wire or cable – Procedure for diffusion flame*

IEC 60335-2-24, *Household and similar electrical appliances – Safety – Part 2-24: Particular requirements for refrigerating appliances, ice-cream appliances and ice-makers.*

IEC 60335-2-89, *Household and similar electrical appliances – Safety – Part 2-89: Particular requirements for commercial refrigerating appliances with an incorporated or remote refrigerant condensing unit or compressor*

IEC 60364-4-44:2007, *Low-voltage electrical installations – Part 4-44: Protection for safety – Protection against voltage disturbances and electromagnetic disturbances*

IEC 60364-4-44:2007/AMD1:2015

IEC 60364-4-44:2007/AMD2:2018

IEC 60417, *Graphical symbols for use on equipment*

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

IEC 60664-3, *Insulation coordination for equipment within low-voltage systems – Part 3: Use of coating, potting or moulding for protection against pollution*

IEC 60695-11-10, *Fire hazard testing – Part 11-10: Test flames – 50 W horizontal and vertical flame test methods*

IEC 60799, *Electrical accessories – Cord sets and interconnection cord sets*

IEC 60825-1, *Safety of laser products – Part 1: Equipment classification and requirements*

IEC 60947-1, *Low-voltage switchgear and controlgear – Part 1: General rules*

IEC 60947-2, *Low-voltage switchgear and controlgear – Part 2: Circuit-breakers*

IEC 60947-3, *Low-voltage switchgear and controlgear – Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units*

IEC 61000-4-5:2014, *Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test*

IEC 61000-4-5:2014/AMD1:2017

IEC 61010-031:2022, *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 61010-2-032, *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*

IEC 61180:2016, *High-voltage test techniques for low-voltage equipment – Definitions, test and procedure requirements, test equipment*¹

IEC 61672-1:2013, *Electroacoustics – Sound level meters – Part 1: Specifications*

IEC 61672-2:2013, *Electroacoustics – Sound level meters – Part 2: Pattern evaluation tests*
IEC 61672-2:2013/AMD1:2017

IEC 62262, *Degrees of protection provided by enclosures for electrical equipment against external impacts (IK code)*

IEC 62471, *Photobiological safety of lamps and lamp systems*

IEC TR 62471-2, *Photobiological safety of lamps and lamp systems – Part 2: Guidance on manufacturing requirements relating to non-laser optical radiation safety*

IEC 62598, *Nuclear instrumentation – Constructional requirements and classification of radiometric gauges*

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*

ISO 306:2013, *Plastics – Thermoplastic materials – Determination of Vicat softening temperature (VST)*

ISO 361, *Basic ionizing radiation symbol*

ISO 3746, *Acoustics – Determination of sound power levels of noise sources using sound pressure – Survey method using an enveloping measurement surface over a reflecting plane*

ISO 7000, *Graphical symbols for use on equipment*

ISO 9614-1, *Acoustics – Determination of sound power levels of noise sources using sound intensity – Part 1: Measurement at discrete points*

ISO 13857, *Safety of machinery – Safety distances to prevent hazard zones being reached by upper and lower limbs*

EN 378-2, *Refrigerating systems and heat pumps – Safety and environmental requirements. Design, construction, testing, marking and documentation*

¹ IEC 61180:2016 replaces everywhere IEC 61180, IEC 61180-1 and IEC 61180-2 are referenced in IEC 61010-1.

INTERNATIONAL STANDARD

NORME INTERNATIONALE



GROUP SAFETY PUBLICATION
PUBLICATION GROUPEE DE SÉCURITÉ

**Safety requirements for electrical equipment for measurement, control, and laboratory use –
Part 2-034: Particular requirements for measurement equipment for insulation resistance and test equipment for electric strength**

**Exigences de sécurité pour appareils électriques de mesurage, de régulation et de laboratoire –
Partie 2-034: Exigences particulières applicables aux appareils de mesure de la résistance d'isolement et aux appareils d'essai de rigidité diélectrique**

CONTENTS

FOREWORD.....	4
INTRODUCTION.....	7
1 Scope and object.....	8
2 Normative references	9
3 Terms and definitions	10
4 Tests	10
5 Marking, documentation and HAZARD indicator	11
6 Protection against electric shock	15
7 Protection against mechanical HAZARDS.....	22
8 Resistance to mechanical stresses	22
9 Protection against the spread of fire and arc flash	22
10 Equipment temperature limits and resistance to heat.....	28
11 Protection against HAZARDS from fluids and solid foreign objects	28
12 Protection against radiation, including laser sources, and against sonic and ultrasonic pressure	28
13 Protection against liberated gases and substances, explosion and implosion	28
14 Components and subassemblies	28
15 Protection by interlocks	28
16 HAZARDS resulting from application.....	28
17 RISK assessment	28
101 Measuring circuits	29
Annexes	32
Annex K (normative) Insulation requirements not covered by 6.7	32
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	50
Annex CC (informative) 4 mm "banana" TERMINALS	53
Annex DD (informative) Flowchart for insulation according to the type of circuit.....	55
Annex EE (informative) Determination of CLEARANCES for Table 101	58
Bibliography.....	59
Figure 101 – Duration of current flow versus body current for a.c. and d.c. currents.....	16
Figure 102 – Test circuit for induced voltage and current	27
Figure K.101 – Circuit with protective screen	36
Figure K.102 – Circuit with DOUBLE INSULATION.....	37
Figure K.103 – Test circuit for evaluation of TRANSIENT OVERVOLTAGE attenuation.....	40
Figure AA.1 – Example to identify the locations of MEASUREMENT CATEGORIES	48
Figure CC.1 – Recommended dimensions of 4 mm TERMINALS	54
Figure DD.1 – Requirements for CLEARANCE, CREEPAGE DISTANCE and solid insulation.....	57
Table 101 – CLEARANCES for unmated measuring circuit TERMINALS.....	17

Table K.15 – CLEARANCE values for the calculation of K.3.2 33

Table K.16 – Test voltages based on CLEARANCES 34

Table K.101 – Impulse voltages for circuits connected to MAINS 39

Table K.102 – CLEARANCES for measuring circuits RATED for MEASUREMENT CATEGORIES 41

Table K.103 – Impulse test voltages for testing electric strength of solid insulation for
measuring circuits RATED for MEASUREMENT CATEGORIES 42

Table K.104 – a.c. test voltages for testing electric strength of solid insulation for
measuring circuits RATED for MEASUREMENT CATEGORIES 42

Table K.105 – Minimum values for distance or thickness of solid insulation for
measuring circuits RATED for MEASUREMENT CATEGORIES 44

Table AA.1 – Characteristics of MEASUREMENT CATEGORIES 49

Table EE.1 – CLEARANCES values for Table 101 58

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**SAFETY REQUIREMENTS FOR ELECTRICAL EQUIPMENT
FOR MEASUREMENT, CONTROL, AND LABORATORY USE –****Part 2-034: Particular requirements for measurement equipment
for insulation resistance and test equipment for electric strength**

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.
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- 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.
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- 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.

IEC 61010-2-034 has been prepared by IEC technical committee 66: Safety of measuring, control and laboratory equipment. It is an International Standard.

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

This second edition cancels and replaces the first edition published in 2017. This edition constitutes a technical revision.

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

- a) in 1.2.1, requirements for protection against HAZARDS which could occur from reading a voltage have been added to the scope;
- b) Clause 2, all normative references have been dated; new normative references have been added;

- c) in 4.3.2.5, requirements for power supply have been modified;
- d) in 4.3.2.6, requirements for inputs/outputs have been modified;
- e) in 5.1.5.101.2, minimum RATINGS for voltage of measuring TERMINALS are required;
- f) in 5.4.2, new RATINGS for documentation have been added;
- g) in 5.4.4, new instructions for operation have been added;
- h) in 5.101.1, HAZARD indicators shall be functional in NORMAL CONDITION and in SINGLE FAULT CONDITION;
- i) in 6.6.101.1, insulating material of group I may be allowed for determination of CREEPAGE DISTANCES of measuring circuit TERMINALS;
- j) in 6.6.101.2, CLEARANCES and CREEPAGE DISTANCES above 1 000 V a.c. and 1 500 V d.c. for measuring circuit TERMINALS in unmated position have been defined;
- k) in 6.6.101.3, requirements for measuring circuit TERMINALS in partially mated position have been specified;
- l) in 6.6.101.4, requirements for measuring circuit TERMINALS in mated position have been specified;
- m) Subclause 6.102 replaces 6.9.103 and has been rephrased;
- n) new Subclause 9.101 to consider the protection of measuring circuits against the spread of fire and arc flash has been added. Table 102 has been replaced by Table K.101;
- o) In 9.101.2, relocation of 101.3 of previous edition;
- p) In 9.101.3, relocation of 101.4 of previous edition, extension to MEASUREMENT CATEGORY II and reference to IEC 61000-4-5 for tests;
- q) in 9.101.4, requirements for measuring circuit TERMINALS in mated position have been specified;
- r) in 9.101.5, relocation of K.103 of previous edition with numerous technical changes;
- s) in 14.101, relocation of 14.102. 14.101 of previous edition has been removed;
- t) in 101.3, relocation of 101.5 of previous edition, and more requirements added against HAZARD occurring from reading a voltage value;
- u) in K.2.1, another method for determination of CLEARANCES of secondary circuits is proposed;
- v) in K.3.2, new Table K.15 and Table K.16 for CLEARANCE calculation;
- w) in K.3.101, relocation of 6.9.104 of previous edition;
- x) in K.101.4.1, new Table K.103 and Table K.104 replace Table K.102, Table K.103 and Table K.104;
- y) in K.101.4, the subclause has been reviewed. Tables and tests for solid insulation have been modified. Table K.105 replaces Table K.9;
- z) Table K.101, replacement of Table K.106;
- aa) Clause K.4, redraft of the clause to propose a method for determination of U_t for circuits which reduce TRANSIENT OVERVOLTAGE;
- bb) Annex EE: addition of a new informative annex for determination of CLEARANCES for Table 101.

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

Draft	Report on voting
66/778/FDIS	66/784/RVD

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

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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.

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 - requirements: in roman type;
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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 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 specifies the safety requirements for hand-held and hand-manipulated current sensors for measuring, detecting or 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 have been included in IEC 61010-2-032. Equipment within the scopes of both IEC 61010-2-030 and IEC 61010-2-032 are considered to be covered by the requirements of IEC 61010-2-032.

However, for current sensors in combined equipment with protective bonding and automatic disconnection of the supply, IEC 61010-2-030 and IEC 61010-2-032 are read in conjunction.

- 3) IEC 61010-2-033 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 have been included in IEC 61010-2-033.

- 4) This document 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 have been included in this document. However, for equipment within the scope of IEC 61010-2-032 and of this document, 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, IEC 61010-2-033 and this document. 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 2-034: Particular requirements for measurement equipment for insulation resistance and test equipment for electric strength

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 to equipment for measuring insulation resistance and to equipment for testing electric strength which have an output voltage exceeding 50 V a.c. or 120 V d.c.

This document also applies to combined measuring equipment which has an insulation resistance measurement function or an electric strength test measurement function.

This group safety publication focusing on safety essential requirements is primarily intended to be used as a product safety standard for the products mentioned in the scope, but is also intended to be used by technical committees in the preparation of publications for products similar to those mentioned in the scope of this document, in accordance with the principles laid down in IEC Guide 104 and ISO/IEC Guide 51.

One of the responsibilities of a technical committee is, wherever applicable, to make use of basic safety publications and/or group safety publications in the preparation of its publications.

1.1.2 Equipment excluded from scope

Add the following new items to the list:

- aa) IEC 61557-8 (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 – Part 8: Insulation monitoring devices for IT systems);
- bb) IEC 61557-9 (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 – Part 9: Equipment for insulation fault location in IT systems).

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 equipment (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.

2 Normative references

IEC 61010-1:2010, Clause 2 and IEC 61010-1:2010/AMD1:2016, Clause 2 apply except as follows:

Replace the following existing normative references:

IEC 60364-4-44:2007, *Low-voltage electrical installations – Part 4-44: Protection for safety – Protection against voltage disturbances and electromagnetic disturbances*
IEC 60364-4-44:2007/AMD1:2015

IEC 61010-031, *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 61180 (all parts), *High-voltage test techniques for low-voltage equipment*

IEC 61180-1, *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 61672-1, *Electroacoustics – Sound level meters – Part 1: Specifications*

IEC 61672-2, *Electroacoustics – Sound level meters – Part 2: Pattern evaluation tests*

with the following new normative references:

IEC 60364-4-44:2007, *Low-voltage electrical installations – Part 4-44: Protection for safety – Protection against voltage disturbances and electromagnetic disturbances*
IEC 60364-4-44:2007/AMD1:2015
IEC 60364-4-44:2007/AMD2:2018

IEC 61010-031:2022, *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 61180:2016, *High-voltage test techniques for low-voltage equipment – Definitions, test and procedure requirements, test equipment*¹

IEC 61672-1:2013, *Electroacoustics – Sound level meters – Part 1: Specifications*

IEC 61672-2:2013, *Electroacoustics – Sound level meters – Part 2: Pattern evaluation tests*
IEC 61672-2:2013/AMD1:2017

¹ IEC 61180:2016 replaces everywhere IEC 61180, IEC 61180-1 and IEC 61180-2 are referenced in IEC 61010-1.

Add the following new normative references:

IEC 61000-4-5:2014, *Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test*
IEC 61000-4-5:2014/AMD1:2017

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*

SOMMAIRE

AVANT-PROPOS.....	62
INTRODUCTION.....	66
1 Domaine d'application et objet.....	67
2 Références normatives.....	68
3 Termes et définitions.....	69
4 Essais.....	69
5 Marquage, documentation et indicateur de DANGER.....	70
6 Protection contre les chocs électriques.....	74
7 Protection contre les DANGERS mécaniques.....	82
8 Résistance aux contraintes mécaniques.....	82
9 Protection contre la propagation du feu et les arcs électriques.....	83
10 Limites de température de l'appareil et résistance à la chaleur.....	89
11 Protection contre les DANGERS des fluides et des corps solides étrangers.....	89
12 Protection contre les radiations, y compris les sources laser, et contre la pression acoustique et ultrasonique.....	89
13 Protection contre les émissions de gaz et substances, les explosions et les implosions.....	89
14 Composants et sous-ensembles.....	89
15 Protection par systèmes de verrouillage.....	89
16 DANGERS résultant de l'application.....	89
17 Appréciation du RISQUE.....	89
101 Circuits de mesure.....	90
Annexes.....	93
Annexe K (normative) Exigences d'isolation non couvertes par 6.7.....	94
Annexe L (informative) Index des termes définis.....	109
Annexe AA (normative) CATEGORIES DE MESURE.....	110
Annexe BB (informative) DANGERS se rapportant aux mesurages effectués dans certains environnements.....	114
Annexe CC (informative) BORNES "bananes" de 4 mm.....	117
Annexe DD (informative) Organigramme de l'isolation selon le type de circuit.....	119
Annexe EE (informative) Détermination des DISTANCES D'ISOLEMENT pour le Tableau 101.....	122
Bibliographie.....	123
Figure 101 – Durée de circulation du courant traversant le corps pour les courants alternatif et continu.....	76
Figure 102 – Circuit d'essai pour la tension et le courant induits.....	88
Figure K.101 – Circuit équipé d'un écran de protection.....	99
Figure K.102 – Circuit équipé d'une DOUBLE ISOLATION.....	100
Figure K.103 – Circuit d'essai pour l'évaluation de l'affaiblissement des SURTENSIONS TRANSITOIRES.....	103
Figure AA.1 – Exemple d'identification des emplacements des CATEGORIES DE MESURE.....	112
Figure CC.1 – Dimensions recommandées des BORNES de 4 mm.....	118

Figure DD.1 – Exigences relatives à la DISTANCE D'ISOLEMENT, à la LIGNE DE FUITE et à l'isolation solide	121
Tableau 101 – DISTANCES D'ISOLEMENT pour les BORNES des circuits de mesure en position découplée	77
Tableau K.15 – Valeurs des DISTANCES D'ISOLEMENT pour le calcul de K.3.2	96
Tableau K.16 – Tensions d'essai en fonction des DISTANCES D'ISOLEMENT	97
Tableau K.101 – Tensions de choc pour les circuits connectés au RESEAU	102
Tableau K.102 – DISTANCES D'ISOLEMENT des circuits de mesure dont les CATEGORIES DE MESURE sont des CARACTERISTIQUES ASSIGNEES	104
Tableau K.103 – Tensions d'essai de choc pour l'essai de rigidité diélectrique de l'isolation solide des circuits de mesure dont les CATEGORIES DE MESURE sont des CARACTERISTIQUES ASSIGNEES	105
Tableau K.104 – Tensions d'essai alternatives pour l'essai de rigidité diélectrique de l'isolation solide des circuits de mesure dont les CATEGORIES DE MESURE sont des CARACTERISTIQUES ASSIGNEES	106
Tableau K.105 – Valeurs minimales pour la LIGNE DE FUITE ou l'épaisseur de l'isolation solide des circuits de mesure dont les CATEGORIES DE MESURE sont des CARACTERISTIQUES ASSIGNEES	107
Tableau AA.1 – Caractéristiques des CATEGORIES DE MESURE	113
Tableau EE.1 – Valeurs des DISTANCES D'ISOLEMENT pour le Tableau 101	122

COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

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

Partie 2-034: Exigences particulières pour les appareils de mesure de la résistance d'isolement et les appareils d'essai de rigidité diélectrique

AVANT-PROPOS

- 1) La Commission Électrotechnique Internationale (IEC) est une organisation mondiale de normalisation composée de l'ensemble des comités électrotechniques nationaux (Comités nationaux de l'IEC). L'IEC a pour objet de favoriser la coopération internationale pour toutes les questions de normalisation dans les domaines de l'électricité et de l'électronique. À cet effet, l'IEC – entre autres activités – publie des Normes internationales, des Spécifications techniques, des Rapports techniques, des Spécifications accessibles au public (PAS) et des Guides (ci-après dénommés "Publication(s) de l'IEC"). Leur élaboration est confiée à des comités d'études, aux travaux desquels tout Comité national intéressé par le sujet traité peut participer. Les organisations internationales, gouvernementales et non gouvernementales, en liaison avec l'IEC, participent également aux travaux. L'IEC collabore étroitement avec l'Organisation Internationale de Normalisation (ISO), selon des conditions fixées par accord entre les deux organisations.
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L'IEC 61010-2-034 a été établie par le comité d'études 66 de l'IEC: Sécurité des appareils de mesure, de commande et de laboratoire. Il s'agit d'une Norme internationale.

Elle a le statut d'une publication groupée de sécurité conformément au Guide IEC 104.

Cette deuxième édition annule et remplace la première édition parue en 2017. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

- a) au paragraphe 1.2.1, les exigences relatives à la protection contre les DANGERS susceptibles de survenir lors de la lecture d'une tension ont été ajoutées au domaine d'application;
- b) à l'Article 2, toutes les références normatives ont été datées et de nouvelles références normatives ont été ajoutées;
- c) au paragraphe 4.3.2.5, les exigences relatives à l'alimentation électrique ont été modifiées;
- d) au paragraphe 4.3.2.6, les exigences relatives aux entrées/sorties ont été modifiées;
- e) au paragraphe 5.1.5.101.2, des VALEURS ASSIGNEES minimales de tension des BORNES des circuits de mesure sont exigées;
- f) au paragraphe 5.4.2, de nouvelles VALEURS ASSIGNEES pour la documentation ont été ajoutées;
- g) au paragraphe 5.4.4, de nouvelles instructions de fonctionnement ont été ajoutées;
- h) au paragraphe 5.101.1, les indicateurs de DANGER doivent être fonctionnels en CONDITION NORMALE et en CONDITION DE PREMIER DEFAUT;
- i) au paragraphe 6.6.101.1, les matériaux isolants du groupe I peuvent être admis pour la détermination des LIGNES DE FUITE des BORNES des circuits de mesure;
- j) au paragraphe 6.6.101.2, les DISTANCES D'ISOLEMENT et les LIGNES DE FUITE supérieures à 1 000 V en courant alternatif et à 1 500 V en courant continu pour les BORNES des circuits de mesure en position découplée ont été définies;
- k) au paragraphe 6.6.101.3, les exigences relatives aux BORNES des circuits de mesure en position partiellement couplée ont été spécifiées;
- l) au paragraphe 6.6.101.4, les exigences relatives aux BORNES des circuits de mesure en position couplée ont été spécifiées;
- m) le paragraphe 6.102 remplace le paragraphe 6.9.103 et a été reformulé;
- n) un nouveau paragraphe 9.101 a été ajouté pour prendre en compte la protection des circuits de mesure contre la propagation du feu et les arcs électriques. Le Tableau 102 a été remplacé par le Tableau K.101;
- o) le paragraphe 101.3 de l'édition précédente a été déplacé au paragraphe 9.101.2;
- p) le paragraphe 101.4 de l'édition précédente a été déplacé au paragraphe 9.101.3. Ce paragraphe a été étendu à la CATEGORIE DE MESURE II et fait référence à l'IEC 61000-4-5 pour les essais;
- q) au paragraphe 9.101.4, les exigences relatives aux BORNES des circuits de mesure en position couplée ont été spécifiées;
- r) le paragraphe K.103 de l'édition précédente a été déplacé au paragraphe 9.101.5 et inclut de nombreuses modifications techniques;
- s) le paragraphe 14.101 de l'édition précédente a été supprimé et le paragraphe 14.102 de l'édition précédente a été déplacé au paragraphe 14.101;
- t) le paragraphe 101.5 de l'édition précédente a été déplacé au paragraphe 101.3 et des exigences supplémentaires ont été ajoutées contre les DANGERS liés à la lecture d'une valeur de tension;
- u) au paragraphe K.2.1, une autre méthode de détermination des DISTANCES D'ISOLEMENT des circuits secondaires a été proposée;
- v) au paragraphe K.3.2, le Tableau K.15 et le Tableau K.16 ont été modifiés pour le calcul de la DISTANCE D'ISOLEMENT;
- w) le paragraphe 6.9.104 de l'édition précédente a été déplacé au paragraphe K.3.101;
- x) au paragraphe K.101.4.1, les nouveaux Tableau K.103 et Tableau K.104 remplacent le Tableau K.102, le Tableau K.103 et le Tableau K.104;
- y) le paragraphe K.101.4 a été révisé. Les tableaux et les essais relatifs à l'isolation solide ont été modifiés. Le Tableau K.105 remplace le Tableau K.9;

- z) le Tableau K.101 remplace le Tableau K.106;
- aa) l'Article K.4 a fait l'objet d'une refonte pour proposer une méthode de détermination de U_t pour les circuits qui réduisent les SURTENSIONS TRANSITOIRES;
- bb) une nouvelle Annexe EE informative a été ajoutée pour la détermination des DISTANCES D'ISOLEMENT pour le Tableau 101.

Le texte de cette Norme internationale est issu des documents suivants:

Projet	Rapport de vote
66/778/FDIS	66/784/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à son approbation.

La langue employée pour l'élaboration de cette Norme internationale est l'anglais.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2, il a été développé selon les Directives ISO/IEC, Partie 1 et les Directives ISO/IEC, Supplément IEC, disponibles sous www.iec.ch/members_experts/refdocs. Les principaux types de documents développés par l'IEC sont décrits plus en détail sous www.iec.ch/standardsdev/publications.

Une liste de toutes les parties de la série IEC 61010, publiées sous le titre général *Exigences de sécurité pour appareils électriques de mesurage, de régulation et de laboratoire*, se trouve sur le site web de l'IEC.

Le présent document est à utiliser conjointement avec l'IEC 61010-1:2010 et l'IEC 61010-1:2010/AMD1:2016.

Le présent document complète ou modifie les articles correspondants de l'IEC 61010-1 de façon à transformer cette publication en Norme IEC: *Exigences particulières applicables aux appareils de mesure de la résistance d'isolement et aux appareils d'essai de rigidité diélectrique*.

Lorsqu'un paragraphe particulier de l'IEC 61010-1 n'est pas mentionné dans le présent document, ce paragraphe s'applique pour autant que cela soit raisonnable. Si le présent document spécifie "ajout", "modification", "remplacement" ou "suppression", il convient d'adapter en conséquence l'exigence, la spécification d'essai ou la note correspondante de l'IEC 61010-1.

Dans la présente norme:

- les caractères d'imprimerie suivants sont employés:
 - exigences: caractères romains;
 - NOTES: petits caractères romains;
 - *conformité et essais: caractères italiques;*
 - termes définis à l'Article 3 et utilisés dans toute la présente norme: CARACTERES ROMAINS en PETITES CAPITALES;
- les paragraphes, figures, tableaux et notes supplémentaires à ceux de l'IEC 61010-1 sont numérotés à partir de 101. Les annexes supplémentaires sont nommées à partir de AA et les listes de termes additionnels à partir de aa).

Le comité a décidé que le contenu de ce document ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous webstore.iec.ch dans les données relatives au document recherché. A cette date, le document sera:

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INTRODUCTION

L'IEC 61010-1 spécifie les exigences de sécurité qui sont d'application générale à tous les appareils qu'elle concerne. Pour certains types d'appareils, les exigences de l'IEC 61010-1 et son amendement sont complétées ou modifiées par les exigences particulières d'une ou de plusieurs normes de la série IEC 61010-2, qui sont utilisées conjointement avec les exigences de l'IEC 61010-1.

- 1) L'IEC 61010-2-030 spécifie les exigences de sécurité pour les appareils équipés de circuits d'essai ou de mesure qui sont reliés, à des fins d'essai ou de mesurage, à des dispositifs ou à des circuits extérieurs à l'appareil de mesure même.
- 2) L'IEC 61010-2-032 spécifie les exigences de sécurité pour les capteurs de courant portatifs et manipulés à la main pour mesurer, détecter ou injecter du courant, ou encore afficher les formes d'onde du courant sur les circuits sans ouverture physique du chemin du courant sur le circuit mesuré.

La plupart des exigences de l'IEC 61010-2-030 ont été incluses dans l'IEC 61010-2-032. Les appareils entrant dans le champ d'application de l'IEC 61010-2-030 et de l'IEC 61010-2-032 sont considérés comme étant couverts par les exigences de l'IEC 61010-2-032.

Cependant, pour les capteurs de courant dans un appareil combiné avec liaison de protection et déconnexion automatique de l'alimentation, l'IEC 61010-2-030 et l'IEC 61010-2-032 sont utilisées conjointement.

- 3) L'IEC 61010-2-033 spécifie les exigences de sécurité pour les multimètres portatifs et autres mesureurs à usage domestique et professionnel, capables de mesurer la tension réseau, destinés à mesurer la tension et d'autres grandeurs électriques comme la résistance ou le courant.

Toutes les exigences pertinentes de l'IEC 61010-2-030 ont été incluses dans l'IEC 61010-2-033.

- 4) Le présent document spécifie les exigences de sécurité applicables aux appareils de mesure de la résistance d'isolement et aux appareils d'essai de rigidité diélectrique qui sont connectés aux unités, aux lignes ou aux circuits à des fins d'essai ou de mesurage.

Toutes les exigences pertinentes de l'IEC 61010-2-030 ont été incluses dans le présent document. Cependant, pour les appareils relevant du domaine d'application de l'IEC 61010-2-032 et du présent document, ces normes sont utilisées conjointement.

L'IEC 61010-031 spécifie les exigences de sécurité relatives aux sondes portatives et manipulées à la main, ainsi que leurs accessoires connexes, destinés à être utilisés en particulier avec les appareils inclus dans le domaine d'application de l'IEC 61010-2-030, de l'IEC 61010-2-032, de l'IEC 61010-2-033 et du présent document. Ces sondes équipées sont prévues pour la connexion sans contact électrique ou la connexion électrique directe entre une partie et un appareil de mesure et d'essai électrique. Elles peuvent être solidaires de l'appareil ou en être des accessoires détachables.

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

Partie 2-034: Exigences particulières pour les appareils de mesure de la résistance d'isolement et les appareils d'essai de rigidité diélectrique

1 Domaine d'application et objet

L'IEC 61010-1:2010, Article 1, et l'IEC 61010-1:2010/AMD1:2016, Article 1, s'appliquent avec les exceptions suivantes:

1.1.1 Appareils inclus dans le domaine d'application

Remplacer le texte existant par le texte suivant:

Le présent document spécifie les exigences de sécurité pour les appareils de mesure de la résistance d'isolement et les appareils d'essai de rigidité diélectrique avec une tension de sortie supérieure à 50 V en courant alternatif ou 120 V en courant continu.

Le présent document s'applique également aux appareils de mesure combinés équipés d'une fonction de mesure de la résistance d'isolement ou d'une fonction d'essai de rigidité diélectrique.

La présente publication groupée de sécurité portant sur les exigences essentielles de sécurité est avant tout destinée à être utilisée en tant que norme en matière de sécurité des produits pour les produits cités dans le domaine d'application. Elle est également destinée à être utilisée par les comités d'études dans le cadre de l'élaboration de publications pour des produits similaires à ceux cités dans le domaine d'application du présent document, conformément aux principes établis dans l'IEC Guide 104 et l'ISO/IEC Guide 51.

L'une des responsabilités d'un comité d'études consiste, le cas échéant, à utiliser les publications fondamentales de sécurité et/ou les publications groupées de sécurité dans le cadre de l'élaboration de ses publications.

1.1.2 Appareils exclus du domaine d'application

Ajouter les nouveaux éléments suivants à la liste:

- aa) IEC 61557-8, *Sécurité électrique dans les réseaux de distribution basse tension au plus égale à 1 000 V c.a. et 1 500 V c.c. – Dispositifs de contrôle, de mesure ou de surveillance de mesures de protection – Partie 8: Contrôleur permanent d'isolement pour réseaux IT;*
- bb) IEC 61557-9, *Sécurité électrique dans les réseaux de distribution basse tension au plus égale à 1 000 V c.a. et 1 500 V c.c. – Dispositifs de contrôle, de mesure ou de surveillance de mesures de protection – Partie 9: Dispositifs de localisation de défauts d'isolement pour réseaux IT.*

1.2.1 Aspects inclus dans le domaine d'application

Remplacer le point c) du deuxième alinéa par le nouveau point c) suivant:

- c) propagation du feu ou des arcs électriques à partir des appareils (voir Article 9);

Remplacer le troisième alinéa par les deux nouveaux alinéas suivants:

Les exigences relatives à la protection contre les DANGERS engendrés par l'UTILISATION NORMALE, le MAUVAIS USAGE RAISONNABLEMENT PREVISIBLE et les facteurs ergonomiques sont spécifiées à l'Article 16 et à l'Article 101.

L'Annexe BB fournit des recommandations aux fabricants d'appareils sur les DANGERS qu'il convient de prendre en compte pour les appareils destinés à effectuer des essais et des mesurages sur des conducteurs dangereux, y compris des conducteurs du RESEAU et des conducteurs de réseaux de télécommunication.

2 Références normatives

L'IEC 61010-1:2010, Article 2, et l'IEC 61010-1:2010/AMD1:2016, Article 2, s'appliquent avec les exceptions suivantes:

Remplacer les références normatives existantes suivantes:

IEC 60364-4-44:2007, *Installations électriques à basse tension – Partie 4-44: Protection pour assurer la sécurité – Protection contre les perturbations de tension et les perturbations électromagnétiques*

IEC 60364-4-44:2007/AMD1:2015

IEC 61010-031, *Règles de sécurité pour appareils électriques de mesurage, de régulation et de laboratoire – Partie 031: Prescriptions de sécurité pour sondes équipées tenues à la main pour mesurage et essais électriques*

IEC 61180 (toutes les parties), *Techniques des essais à haute tension pour matériels à basse tension*

IEC 61180-1, *Techniques des essais à haute tension pour matériels à basse tension – Partie 1: Définitions, prescriptions et modalités relatives aux essais*

IEC 61180-2, *Techniques des essais à haute tension pour matériel à basse tension – Partie 2: Matériel d'essai*

IEC 61672-1, *Électroacoustique – Sonomètres – Partie 1: Spécifications*

IEC 61672-2, *Électroacoustique – Sonomètres – Partie 2: Essais d'évaluation d'un modèle*

par les nouvelles références normatives suivantes:

IEC 60364-4-44:2007, *Installations électriques à basse tension – Partie 4-44: Protection pour assurer la sécurité – Protection contre les perturbations de tension et les perturbations électromagnétiques*

IEC 60364-4-44:2007/AMD1:2015

IEC 60364-4-44:2007/AMD2:2018

IEC 61010-031:2022, *Exigences de sécurité pour appareils électriques de mesurage, de régulation et de laboratoire – Partie 031: Exigences de sécurité pour sondes équipées tenues à la main et manipulées pour mesurage et essais électriques*

IEC 61180:2016, *Techniques des essais à haute tension pour matériel à basse tension – Définitions, exigences et modalités relatives aux essais, matériel d'essai*¹

IEC 61672-1:2013, *Électroacoustique – Sonomètres – Partie 1: Spécifications*

IEC 61672-2:2013, *Électroacoustique – Sonomètres – Partie 2: Essais d'évaluation d'un modèle*

IEC 61672-2:2013/AMD1:2017

Ajouter les nouvelles références normatives suivantes:

IEC 61000-4-5:2014, *Compatibilité électromagnétique (CEM) — Partie 4-5: Techniques d'essai et de mesure – Essai d'immunité aux ondes de choc*

IEC 61000-4-5:2014/AMD1:2017

IEC 61010-2-032, *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*

¹ L'IEC 61180:2016 remplace partout où l'IEC 61180. L'IEC 61180-1 et l'IEC 61180-2 sont référencées dans l'IEC 61010-1.