

BUREAU OF INDIAN STANDARDS

DRAFT FOR COMMENTS ONLY

(Not to be reproduced without the permission of BIS or used as an Indian Standard)

मसौदा भारतीय मानक

मापन, नियंत्रण और प्रयोगशाला उपयोग के लिए विद्युत
उपकरणों के लिए सुरक्षा आवश्यकताएँ –
भाग 1: सामान्य आवश्यकताएँ

(पहला पुनरीक्षण)

Draft Indian Standard

*Safety requirements for electrical equipment for
measurement, control, and laboratory use –
Part 1: General requirements*

(First Revision)

ICS 19.080 71.040.10

©BIS 2024

© IEC 2017

NATIONAL FOREWORD

(Formal clauses will be added later)

This Draft Indian Standard (First Revision) which is identical with IEC 61010-1:2010+AMD1:2016 CSV ‘Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements’ issued by the International Electrotechnical Commission (IEC) *will be* adopted by the Bureau of Indian Standards on the recommendation of Electronic Measuring Instruments, Systems And Accessories Sectional Committee, LITD 08 and approval of the Electronics and Information Technology Division Council.

This standard was originally published in 2003 and was identical with IEC 60348:1978. The first revision of this standard has been taken to align with the latest version of IEC 61010-1:2010+AMD1:2016 CSV.

This edition includes the following significant changes from the second edition, as well as numerous other changes.

- The scope of the standard has been expanded to include all locations where these products may be used, so that both professional and non-professional versions of these products are within the scope.
- The requirements for testing and measuring circuits (in various sub clauses and the entirety of Clause 16) have been removed and included in a particular standard IEC 61010-2-030.
- Insulation requirements (6.7) have been completely rewritten.
- Specific requirements have been added for solid insulation and thin-film insulation.
- Subclause 6.7 now contains only the insulation requirements for MAINS CIRCUITS of OVERVOLTAGE CATEGORY II up to 300 V, and for secondary circuits.
- The insulation requirements for all other circuits have been moved to a new Annex K.
- Additional requirements for protection against mechanical HAZARDS (Clause 7) have been included.
- Surface temperature limits (Clause 10) have been modified to conform to the limits of EN 563.
- Radiation requirements (Clause 12) have been modified, and take into account a distinction between intended emission and unintended emission.
- Requirements for reasonably foreseeable misuse and ergonomic aspects have been added (Clause 16).
- A new clause (Clause 17) has been added to deal with HAZARDS and environments not covered by the standard, along with a new informative annex (Annex J) dealing with RISK assessment.
- A new informative annex (Annex E) addresses methods of reducing the POLLUTION DEGREE of a micro-environment.
- Requirements for the qualification of coatings for protection against POLLUTION have been added (Annex H).
- A new informative annex (Annex I) has been added to further explain how to determine the WORKING VOLTAGE of a MAINS CIRCUIT.

The text of IEC Standard *may be* approved as suitable for publication as an Indian Standard without deviations. Certain conventions are however not identical to those used in Indian Standards. Attention is particularly drawn to the following:

- a) Wherever the words ‘International Standard’ appears referring to this standard, they should be read as ‘Indian Standard’.
- b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appears to certain International Standards for which Indian Standards also exist. The corresponding Indian Standards, which are to be substituted in their respective places, are listed below along with their degree of equivalence for the editions indicated.

For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies:

International standards	Corresponding Indian standards	Degree of Equivalence
IEC 60027 (all parts), Letter symbols to be used in electrical technology	IS 3722 : 2023 (all parts) Letter symbols and signs used in electrical technology	Identical with IEC 60027
IEC 60065, Audio, video and similar electronic apparatus – Safety requirements	IS 616 : 2017 Audio, video and similar electronic apparatus - Safety requirements (Fifth Revision)	Identical With IEC 60065
IEC 60068-2-75, Environmental testing – Part 2-75: Tests – Test Eh: Hammer tests	IS 9000 (Part 7/Sec 7) : 2020 Environmental Testing Part 7 Tests Section 7 Test Eh: Hammer tests (First Revision)	Identical with IEC 60068-2-75
IEC 60073, Basic and safety principles for man-machine interface, marking and identification – Coding principles for indicators and actuators	IS/IEC 60073 : 2002 Basic and safety principles for man-machine interface marking and identification - Coding principles for indicators and actuators	Identical with IEC 60073 : 2002
IEC 60309 (all parts), Plugs, socket-outlets and couplers for industrial purposes	IS/IEC 60309 (all parts), Plugs fixed or portable socket-outlets and appliance inlets for industrial purposes	Identical with IEC 60309

IEC 60320 (all parts), Appliance couplers for household and similar general purposes	IS/IEC 60320 (all parts), Appliance couplers for household and similar general purposes	Identical with IEC 60320
IEC 60335-2-24, Household and similar electrical appliances – Safety – Part 2-24: Particular requirements for refrigerating appliances, ice-cream appliances and ice-makers.	IS 302 (Part 2/Sec 24) : 1994 Safety of household and similar electrical appliances: Part 2 particular requirements: Sec 24 refrigerators, food - Freezers and ice - Makers	Identical with IEC 60335-2-24
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	IS/IEC 60335-2-89 : 2010 Household and similar electrical appliances - Safety: Part 2 - 89: particular requirements for commercial refrigerating appliances with an incorporated or remote refrigerant unit or compressor	Identical with IEC 60335-2-89
IEC 60529, Degrees of protection provided by enclosures (IP Code)	IS/IEC 60529 : 2001 Degrees of protection provided by enclosures (IP Code)	Identical with IEC 60529
IEC 60664-3, Insulation coordination for equipment within low-voltage systems – Part 3: Use of coating, potting or moulding for protection against pollution	IS 15382 (Part 3) : 2019 Insulation coordination for equipment within low-voltage systems : Part 3 use of coating potting or moulding for protection against pollution	Identical with IEC 60664-3
IEC 60695-11-10, Fire hazard testing – Part 11-10: Test flames – 50 W horizontal and vertical flame test methods	IS/IEC 60695-11-10 : 2013 Fire hazard testing: Part 11 test flames :: Sec 10 50 w horizontal and vertical flame test methods	Identical with IEC 60695-11-10
IEC 60947-1, Low-voltage switchgear and controlgear – Part 1: General rules	IS/IEC 60947-1 : 2020 Low-Voltage Switchgear And Controlgear Part 1 General Rules	Identical with IEC 60947-1
IEC 60947-2, Low-voltage switchgear and controlgear – Part 2: Circuit-breakers	IS/IEC 60947-2 : 2016 Low - Voltage switchgear and controlgear: Part 2 circuit - Breakers (First Revision)	Identical with IEC 60947-2
IEC 60947-3, Low-voltage switchgear and controlgear – Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units	IS/IEC 60947-3 : 2020 Low-Voltage Switchgear and Controlgear: Part 3 Switches Disconnectors Switch-Disconnectors and Fuse-Combination Units	Identical with IEC 60947-3

IEC 61180 (all parts), High-voltage test techniques for low-voltage equipment	IS 16826 : 2018 High - Voltage Test Techniques For Low-Voltage Equipment - Definitions, Test and Procedure Requirements, Test Equipment	Identical with IEC 61180
IEC 61672-1, Electroacoustics – Sound level meters – Part 1: Specifications	IS 15575 (Part 1) : 2016 Electroacoustics - Sound level meters: Part 1 specifications (First Revision)	Identical with IEC 61672-1
IEC 61672-2, Electroacoustics – Sound level meters – Part 2: Pattern evaluation tests	IS 15575 (Part 2) : 2023 Electroacoustics - Sound level meters: Part 2 pattern - Evaluation tests (First Revision) (Withdrawn)	Identical with IEC 61672-2
IEC 62262, Degrees of protection provided by enclosures for electrical equipment against external impacts (IK code)	IS 17050 : 2023 Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts IK Code	Identical with IEC 62262
IEC 62471, Photobiological safety of lamps and lamp systems	IS 16108 : 2012 Photobiological safety of lamps and lamp systems	Identical with IEC 62471
IEC TR 62471-2, Photobiological safety of lamps and lamp systems – Part 2: Guidance on manufacturing requirements relating to non-laser optical radiation safety	IS 16108 (Part 2) : 2018 Photobiological safety of lamps and lamp systems: Part 2 guidance on manufacturing requirements relating to non - Laser optical radiation safety	Identical with IEC 62471-2
IEC 62598, Nuclear instrumentation – Constructional requirements and classification of radiometric gauges	IS 11868 : 2018 Nuclear instrumentation - Constructional requirements and classification of radiometric gauges (First Revision)	Identical with IEC 62598
ISO 361, Basic ionizing radiation symbol	IS 16885 : 2018 Basic ionizing radiation symbol	Identical with ISO 361
ISO 7000, Graphical symbols for use on equipment	IS 16450 : 2023 Graphical Symbols for Use on Equipment Registered Symbols	Identical with ISO 7000
ISO 13857	IS 16814 : 2021 Safety of Machinery Safety Distances to Prevent Hazard	Identical with ISO 13857

	Zones being reached by upper and Lower Limbs	
--	--	--

The technical committee has reviewed the provisions of the following international standards referred in this adopted draft standard and has decided that it is acceptable for use in conjunction with this standard. For dated references, only the edition cited applies. For updated references, the latest edition of the referenced document (including any amendments) applies:

International Standards	Titles
IEC 60068-2-14	Environmental testing – Part 2-14: Tests – Test N: Change of temperature
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 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 premixed 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 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 60417	Graphical symbols for use on equipment
IEC 60799	Electrical accessories – Cord sets and interconnection cord sets
IEC 60825-1	Safety of laser products – Part 1: Equipment classification and requirements
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 61180-1	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 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 306:1994 2013	Plastics – Thermoplastic materials – Determination of Vicat softening temperature (VST)

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 9614-1	Acoustics – Determination of sound power levels of noise sources using sound intensity – Part 1: Measurement at discrete points
EN 378-2	Refrigerating systems and heat pumps – Safety and environmental requirements. Design, construction, testing, marking and documentation

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2:2022 ‘Rules for rounding off numerical values (*Second Revision*)’. The number of significant places retained in the rounded off value should be same as that of the specified value in this standard.

SCOPE OF IEC 61010-1:2010+AMD1:2016 CSV

“1.1.1 Equipment included in scope

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

This part of IEC 61010 specifies general safety requirements for the following types of electrical equipment and their accessories, wherever they are intended to be used.

a) Electrical test and measurement equipment

This is equipment which by electromagnetic means tests, measures, indicates or records one or more electrical or physical quantities, also non-measuring equipment such as signal generators, measurement standards, power supplies for laboratory use, transducers, transmitters, etc.

NOTE 1 This includes bench-top power supplies intended to aid a testing or measuring operation on another piece of equipment. Power supplies intended to power equipment are within the scope of IEC 61558 (see 1.1.2 h).

This standard also applies to test equipment integrated into manufacturing processes and intended for testing manufactured devices.

NOTE 2 Manufacturing test equipment is likely to be installed adjacent to and interconnected with industrial machinery in this application.

b) Electrical industrial process-control equipment

This is equipment which controls one or more output quantities to specific values, with each value determined by manual setting, by local or remote programming, or by one or more input variables.

c) Electrical laboratory equipment

This is equipment which measures, indicates, monitors, inspects or analyses materials, or is used to prepare materials, and includes in vitro diagnostic (IVD) equipment.

This equipment may also be used in areas other than laboratories; examples include selftest IVD equipment to be used in the home and inspection equipment to be used to check people or material during transportation.

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).

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).”

Note: - The Technical content of this document has not been enclosed as these are identical with the corresponding IEC Standard. For details, please refer to IEC 61010-1:2010+AMD1:2016 CSV or kindly contact.

Head,
Electronics & IT Department
Bureau of Indian Standards
9, B.S. Zafar Marg,
New Delhi-110002

Doc No.: LITD 08 (26601) WC
Draft IS 9858: 2024
IEC 61010-1:2010+AMD1:2016 CSV
November 2024

Email: litd@bis.gov.in, litd08@bis.gov.in