



# DRAFT TANZANIA STANDARD

**(Draft for comments only)**

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**Automatic electrical controls – Part 1: General requirements**

**TANZANIA BUREAU OF STANDARDS**

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## 1 National Foreword

This draft Tanzania Standard has been prepared by the TBS Electrical Equipment Technical Committee, under the supervision of the Electrotechnical Divisional Standards Committee (EDC)

This draft Tanzania Standard is identical to the International Standard IEC 60730-1: 2022 Automatic electrical controls – Part 1: General requirements, which has been prepared by the International Electrotechnical Commission.

## 2 Terminology and conventions

Some terminologies and certain conventions are not identical with those used in Tanzania standards; attention is drawn especially to the following: -

- 1) The comma has been used as a decimal marker for metric dimensions. In Tanzania Standards, it is current practice to use “full point” on the baseline as the decimal marker.
- 2) Where the words “International Standard(s)” appear, referring to this standard they should read “Tanzania Standard(s)”



## AUTOMATIC ELECTRICAL CONTROLS –

### Part 1: General requirements

#### 1 Scope

This document applies to automatic electrical controls

- for use in, on, or in association with equipment for household appliance and similar use;

NOTE 1 Throughout this document, the word "equipment" means "appliance and equipment".

- for building automation within the scope of ISO 16484 series and IEC 63044 series (HBES/BACS);

EXAMPLE 1 Independently mounted water valves, controls in smart grid systems and controls for building

automation systems within the scope of ISO 16484-2.

- for equipment that is used by the public, such as equipment intended to be used in shops, offices, hospitals, farms and commercial and industrial applications;

EXAMPLE 2 Controls for commercial catering, heating and air-conditioning equipment.

- that are smart enabled controls;

EXAMPLE 3 Smart grid control, remote interfaces/control of energy-consuming equipment including computer or

smart phone.

- that are AC or DC powered controls with a rated voltage not exceeding 690 V AC or 600 V DC where the DC source is provided by primary or secondary batteries;
- used in, on, or in association with equipment that use electricity, gas, oil, solid fuel, solar thermal energy, etc., or a combination thereof;
- utilized as part of a control system or controls which are mechanically integral with multifunctional controls having non-electrical outputs;
- using NTC or PTC thermistors and to discrete thermistors, requirements for which are contained in Annex J;
- that are mechanically or electrically operated, responsive to or controlling such characteristics as temperature, pressure, passage of time, humidity, light, electrostatic



effects, flow, or liquid level, current, voltage, acceleration, or combinations thereof;

- as well as manual controls when such are electrically and/or mechanically integral with automatic controls.

NOTE 2 Requirements for manually actuated mechanical switches not forming part of an automatic control are

contained in IEC 61058-1-1.

This document applies to

- the inherent safety of automatic electrical controls, and
- functional safety of automatic electrical controls and safety related systems,
- controls where the performance (for example the effect of EMC phenomena) of the product can impair the overall safety and performance of the controlled system,
- the operating values, operating times, and operating sequences where such are associated with equipment safety.

This document specifies the requirements for construction, operation and testing of automatic electrical controls used in, on, or in association with an equipment.

This document does not

- apply to automatic electronic controls intended exclusively for industrial process applications unless explicitly mentioned in the relevant part 2 or the equipment standard. However, this document can be applied to evaluate automatic electrical controls intended specifically for industrial applications in cases where no relevant safety standard exists.
- take into account the response value of an automatic action of a control, if such a response value is dependent upon the method of mounting the control in the equipment. Where a response value is of significant purpose for the protection of the user, or surroundings, the value defined in the appropriate equipment standard or as determined by the manufacturer will apply.
- address the integrity of the output signal to the network devices, such as interoperability



with other devices unless it has been evaluated as part of the control system.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content

constitutes requirements 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 60038, IEC standard voltages

IEC 60065:2014, Audio, video and similar electronic apparatus – Safety requirements

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

IEC 60085, Electrical insulation – Thermal evaluation and designation

IEC 60099-1:1991, Surge arresters – Part 1: Non-linear resistor type gapped surge arresters for a.c. systems<sup>1</sup>

IEC 60112:2020, Method for the determination of the proof and the comparative tracking indices of solid insulating materials

IEC 60127 (all parts), Miniature fuses

IEC 60227-1, Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V – Part 1: General requirements

IEC 60245-1, Rubber insulated cables – Rated voltages up to and including 450/750 V – Part 1: General requirements

IEC 60269 (all parts), Low-voltage fuses

IEC 60335-1:2020, Household and similar electrical appliances – Safety – Part 1: General requirements

IEC 60384-14, Fixed capacitors for use in electronic equipment – Part 14: Sectional specification – Fixed capacitors for electromagnetic interference suppression and connection to the supply mains



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IEC 60384-16, Fixed capacitors for use in electronic equipment – Part 16: Sectional specification – Fixed metallized polypropylene film dielectric DC capacitors

IEC 60384-17, Fixed capacitors for use in electronic equipment – Part 17: Sectional specification – Fixed metallized polypropylene film dielectric AC and pulse capacitors

IEC 60417, Graphical symbols for use on equipment

IEC 60423, Conduit systems for cable management – Outside diameters of conduits for electrical installations and threads for conduits and fittings

IEC 60529:1989, Degrees of protection provided by enclosures (IP code)

IEC 60529:1989/AMD1:1999

IEC 60529:1989/AMD2:2013

IEC 60539 (all parts), Directly heated negative temperature coefficient thermistors

IEC 60664-1:20072, Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests

IEC TR 60664-2 (all parts), Insulation coordination for equipment within low-voltage systems

IEC 60664-3:2016, Insulation coordination for equipment within low-voltage systems – Part 3: Use of coating, potting or moulding for protection against pollution

IEC 60664-4, Insulation coordination for equipment within low-voltage systems – Part 4: Consideration of high-frequency voltage stress

IEC 60695-2-10, Fire hazard testing – Part 2-10: Glowing/hot-wire based test methods – Glow-wire apparatus and common test procedure

IEC 60695-2-11:2021, Fire hazard testing – Part 2-11: Glowing/hot-wire based test methods – Glow-wire flammability test method for end-products (GWEPT)

IEC 60695-10-2, Fire hazard testing – Part 10-2: Abnormal heat – Ball pressure test method

IEC 60738 (all parts), Thermistors – Directly heated positive temperature coefficient



IEC 60747-5-5, Semiconductor devices – Part 5-5: Optoelectronic devices – Photocouplers

IEC 60884-1, Plugs and socket-outlets for household and similar purposes – Part 1: General requirements

IEC 60884-2-5:2017, Plugs and socket-outlets for household and similar purposes – Part 2-5: Particular requirements for adaptors

IEC 60998-2-2, Connecting devices for low-voltage circuits for household and similar purposes – Part 2-2: Particular requirements for connecting devices as separate entities with screwless-type clamping units

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IEC 60998-2-3, Connecting devices for low-voltage circuits for household and similar purposes – Part 2-3: Particular requirements for connecting devices as separate entities with insulation-piercing clamping units

IEC 60999-1, Connecting devices – Electrical copper conductors – Safety requirements for screw-type and screwless-type clamping units – Part 1: General requirements and particular requirements for clamping units for conductors from 0,2 mm<sup>2</sup> up to 35 mm<sup>2</sup> (included)

IEC 61000-3-2, Electromagnetic compatibility (EMC) – Part 3-2: Limits – Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)

IEC 61000-3-3, Electromagnetic compatibility (EMC) – Part 3-3: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection

IEC 61000-3-11, Electromagnetic compatibility (EMC) – Part 3-11: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems – Equipment with rated current ≤ 75 A and subject to conditional connection

IEC 61000-3-12, Electromagnetic compatibility (EMC) – Part 3-12: Limits – Limits for harmonic



currents produced by equipment connected to public low-voltage systems with input current >16 A and  $\leq 75$  A per phase

IEC 61000-4-2:2008, Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test

IEC 61000-4-3, Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test

IEC 61000-4-4, Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test

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 61000-4-6, Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields

IEC 61000-4-8, Electromagnetic compatibility (EMC) – Part 4-8: Testing and measurement techniques – Power frequency magnetic field immunity test

IEC 61000-4-11, Electromagnetic compatibility (EMC) – Part 4-11: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity tests for equipment with current up to 16 A per phase

IEC 61000-4-13:2002, Electromagnetic compatibility (EMC) – Part 4-13: Testing and measurement techniques – Harmonics and interharmonics including mains signalling at a.c. power port, low frequency immunity tests

IEC 61000-4-13:2002 /AMD1:2009

IEC 61000-4-13:2002 /AMD2:2015

IEC 61000-4-20, Electromagnetic compatibility (EMC) – Part 4-20: Testing and measurement techniques – Emission and immunity testing in transverse electromagnetic (TEM) waveguides

IEC 61000-4-21, Electromagnetic compatibility (EMC) – Part 4-21: Testing and measurement techniques – Reverberation chamber test methods





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IEC 61000-4-22, Electromagnetic compatibility (EMC) – Part 4-22: Testing and measurement techniques – Radiated emissions and immunity measurements in fully anechoic rooms (FARs)

IEC 61000-4-28, Electromagnetic compatibility (EMC) – Part 4-28: Testing and measurement techniques – Variation of power frequency, immunity test for equipment with input current not exceeding 16A per phase

IEC 61000-6-1:2016, Electromagnetic compatibility (EMC) – Part 6-1: Generic standards – Immunity standard for residential, commercial and light-industrial environments

IEC 61000-6-2:2016, Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity standard for industrial environments

IEC 61000-6-3:2020, Electromagnetic compatibility (EMC) – Part 6-3: Generic standards – Emission standard for equipment in residential environments

IEC 61000-6-4:2018, Electromagnetic compatibility (EMC) – Part 6-4: Generic standards – Emission standard for industrial environments

IEC 61051-1, Varistors for use in electronic equipment – Part 1: Generic specification

IEC 61051-2, Varistors for use in electronic equipment – Part 2: Sectional specification for surge suppression varistors

IEC 61051-2-2, Varistors for use in electronic equipment – Part 2: Blank detail specification for zinc oxide surge suppression varistors. Assessment level E

IEC 61210, Connecting devices – Flat quick-connect terminations for electrical copper conductors – Safety requirements

IEC 61249 (all parts), Materials for printed boards and other interconnecting structures

IEC 61558-2-6, Safety of transformers, reactors, power supply units and combinations thereof – Part 2-6: Particular requirements and tests for safety isolating transformers and power supply units incorporating safety isolating transformers for general applications

IEC 61558-2-16, Safety of transformers, reactors, power supply units and combinations thereof



– Part 2-16: Particular requirements and tests for switch mode power supply units and transformers for switch mode power supply units for general applications

IEC 61810-3, Electromechanical elementary relays – Part 3: Relays with forcibly guided (mechanically linked) contacts

IEC 62151, Safety of equipment electrically connected to a telecommunication network

IEC 62319 (all parts), Polymeric thermistors – Directly heated positive step function temperature coefficient

IEC 62326 (all parts), Printed boards

IEC 62368-1, Audio/video, information and communication technology equipment – Part 1: Safety requirements

IEC 63044 (all parts), Home and Building Electronic Systems (HBES) and Building Automation and Control Systems (BACS)

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CISPR 11, Industrial, scientific and medical equipment – Radio-frequency disturbance characteristics – Limits and methods of measurement

CISPR 14-1:2020, Electromagnetic compatibility – Requirements for household appliances, electric tools and similar apparatus – Part 1: Emission

CISPR 32:2015, Electromagnetic compatibility of multimedia equipment – Emission requirements

CISPR 32:2015/AMD1:2019

ISO 4046-4:2016, Paper, board, pulps and related terms – Vocabulary – Part 4: Paper and board grades and converted products

ISO 7637-2:2011, Road vehicles – Electrical disturbances from conduction and coupling – Part 2:

Electrical transient conduction along supply lines only

ISO 7637-3:2016, Road vehicles – Electrical disturbances from conduction and coupling – Part 3:



Electrical transient transmission by capacitive and inductive coupling via lines other than supply lines

ISO 16484 (all parts), Building automation and control systems (BACS)

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