IEC 60255-1

Edition 2.0 2022-12

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Measuring relays and protection equipment – Part 1: Common requirements

Relais de mesure et dispositifs de protection – Partie 1: Exigences communes

IEC 60255-1:2022-12(en-fr)

IEC Secretariat
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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MEASURING RELAYS AND PROTECTION EQUIPMENT –

Part 1: Common requirements

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.
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IEC 60255-1 has been prepared by IEC technical committee 95: Measuring relays and protection equipment. It is an International Standard.

This second edition cancels and replaces the first edition published in 2009. This edition constitutes a technical revision.

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

a) scope of document clarified;
b) merging units and communications as an integral part of the protection added;
c) binary output clarification expanded;
d) environmental operating conditions added (Annex B);
e) test reference conditions added;
f) multiple changes to improve understanding across most clauses;
g) derating by manufacturer added;

h) safety and EMC tests removed from document and referenced only;

i) relay setting and type test guidelines modified (Annex A)

j) battery monitor port and low power instrument transformers added.

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

Draft	Report on voting
95/513/FDIS	95/521/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 in the IEC 60255 series, published under the general title *Measuring relays and protection equipment*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

INTRODUCTION

The following explains the numbering of documents falling under the responsibility of TC 95:

The numbering of documents follows the following principle:

- common standards start with IEC 60255–XX;
- protection functional standards fall into IEC the 60255-1XX series.

The IEC 60255 series consists of the following parts:

a) Common standards:
   Part 1: Common requirements
   Part 21: Vibration, shock, bump and seismic tests
   Part 24: Common format for transient data exchange (COMTRADE) for power systems
   Part 26: Electromagnetic compatibility requirements
   Part 27: Product safety requirements
b) Protection functional standards:
   Part 1XX: Functional requirements

NOTE The last two digits of the part of the proposed functional standard new numbering correspond to function numbers as established in IEEE Std C37.2™-2008 [3][1].

[1] Numbers in square brackets refer to the Bibliography.

MEASURING RELAYS AND PROTECTION EQUIPMENT –

Part 1: Common requirements

1 Scope

This part of IEC 60255 specifies common rules and requirements applicable to measuring relays and protection equipment, including any combination of equipment to form a distributed protection scheme for power system protection such as control, monitoring and process interface equipment, to obtain uniformity of requirements and tests. This document covers the main technologies in use today; other emerging technologies present specific EMC and safety issues but the philosophy in this document will be applied.

All measuring relays and protection equipment used for protection within the power system environment are covered by this document. Other documents in this series can define their own requirements which in such cases take precedence. The typical locations for measuring relays and protection equipment are where protection of electrical equipment is required: generally power stations, substations and industrial locations.

Measuring relays and protection equipment installed in special applications (marine, railways, aerospace, explosive atmospheres, computer centres, etc.) could be enhanced by additional requirements required by that application.

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 60068-2-1, *Environmental testing – Part 2-1: Tests – Test A: Cold*

IEC 60068-2-2, *Environmental testing – Part 2-2: Tests – Test B: Dry heat*

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

IEC 60068-2-30, *Environmental testing – Part 2-30: Tests – Test Db: Damp heat, cyclic (12 h + 12 h cycle)*

IEC 60068-2-78, *Environmental testing – Part 2-78: Tests – Test Cab: Damp heat, steady state*

IEC 60255-21-1, *Electrical relays – Part 21: Vibration, shock, bump and seismic tests on measuring relays and protection equipment – Section One: Vibration tests (sinusoidal)*

IEC 60255-21-2, *Electrical relays – Part 21: Vibration, shock, bump and seismic tests on measuring relays and protection equipment – Section Two: Shock and bump tests*

IEC 60255-21-3, *Electrical relays – Part 21: Vibration, shock, bump and seismic tests on measuring relays and protection equipment – Section 3: Seismic tests*

IEC 60255-26, *Measuring relays and protection equipment – Part 26: Electromagnetic compatibility requirements*

IEC 60255-27, *Measuring relays and protection equipment – Part 27: Product safety requirements*

IEC 60255-1XX (all parts), *Measuring relays and protection equipment – Part 1XX: Functional requirements*

IEC 60688, *Electrical measuring transducers for converting AC and DC electrical quantities to analogue or digital signals*

IEC 61810-1, *Electromechanical elementary relays – Part 1: General and safety requirements*

IEC 61869-2, *Instrument transformers – Part 2: Additional requirements for current transformers*

IEC 61869-3, *Instrument transformers – Part 3: Additional requirements for inductive voltage transformers*

IEC 61869-5, *Instrument transformers – Part 5: Additional requirements for capacitor voltage transformers*

IEC 61869-10, *Instrument transformers – Part 10: Additional requirements for low-power passive current transformers*

IEC 61869-11, *Instrument transformers – Part 11: Additional requirements for low-power passive voltage transformers*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

3.1.1
absolute error
difference between a measured value and its declared value

[SOURCE: IEC 60050-447:2020 [5], 447-08-01]

3.1.2
analogue input port
port intended for current or voltage input whose values are directly proportional to physical measured quantities, i.e. transducer input (measuring temperature, light, etc.)

3.1.3
analogue output port
port that generates an analogue output signal to drive actuators, analogue panel meters, etc.

Note 1 to entry: Typically a current or voltage less than or equal to 20 mA or 10 V DC respectively.