

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Measuring relays and protection equipment –
Part 1: Common requirements**

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



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

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

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CONTENTS

FOREWORD.....	5
INTRODUCTION.....	7
1 Scope.....	8
2 Normative references	8
3 Terms, definitions and abbreviated terms	9
3.1 Terms and definitions.....	9
3.2 Abbreviated terms.....	15
4 Environmental conditions.....	15
4.1 General.....	15
4.2 Normal environmental conditions	16
4.3 Special environmental conditions	16
4.4 Environmental storage conditions	16
4.5 Transport conditions	16
5 Ratings.....	16
5.1 General.....	16
5.2 Rated voltage	17
5.2.1 Input energizing voltage.....	17
5.2.2 Auxiliary power supply port energizing voltage.....	17
5.2.3 Rated insulation voltage	17
5.3 Rated current – Input energizing current	17
5.3.1 Primary relay	17
5.3.2 Secondary relay.....	17
5.4 Binary input and output port.....	18
5.4.1 Binary input port	18
5.4.2 Binary output port	18
5.5 Transducer analogue input and output port	19
5.5.1 Transducer analogue input port	19
5.5.2 Transducer analogue output port	19
5.6 Frequency.....	19
5.6.1 Rated frequency	19
5.6.2 Frequency operating range	19
5.7 Rated burden	19
5.8 Rated ambient temperature range	20
6 Design and construction	20
6.1 Marking.....	20
6.2 Dimensions.....	20
6.3 Enclosure protection	20
6.4 Product safety requirements	20
6.5 Functional performance requirements	20
6.5.1 General	20
6.5.2 Intrinsic accuracy.....	21
6.5.3 Operating accuracy.....	22
6.5.4 Performance under system conditions	22
6.5.5 Performance of multifunctional protection equipment	22
6.5.6 Internal user programmable logic.....	22
6.6 Communication protocols.....	22

6.7	Cybersecurity	22
6.8	Binary input and output port	23
6.8.1	Binary input port	23
6.8.2	Binary output port	23
6.9	Transducer analogue input and output port	23
6.9.1	Transducer analogue input port	23
6.9.2	Transducer analogue output port	23
6.10	Input circuit for measurement quantities	23
6.10.1	Analogue voltage port	23
6.10.2	Analogue current port	23
6.10.3	Communication port	24
6.11	Binary output performance (mechanical and static)	24
6.12	Climatic performance	24
6.12.1	General	24
6.12.2	Verification procedure	24
6.12.3	Climatic environmental tests	25
6.13	Mechanical requirements	29
6.13.1	Vibration response and endurance (sinusoidal)	29
6.13.2	Shock response, shock withstand and bump	29
6.13.3	Seismic risk	29
6.14	Pollution	29
6.15	Electromagnetic compatibility (EMC)	29
7	Tests	29
7.1	Test reference conditions	29
7.2	Test overview	30
7.3	Burden measurements	32
7.3.1	Burden for analogue voltage inputs	32
7.3.2	Burden for analogue current inputs	32
7.3.3	Burden for AC power supply	32
7.3.4	Burden for DC power supply	32
7.3.5	Burden for binary input	33
7.4	Type test report content	33
8	Marking, labelling and packaging	34
9	Product documentation and technical data	34
Annex A	(normative) Type testing guidelines	35
A.1	General	35
A.2	Protection setting	35
A.2.1	Introductory remark	35
A.2.2	Test philosophy	35
A.2.3	Overcurrent and undercurrent	36
A.2.4	Overvoltage and undervoltage	37
A.2.5	Over frequency and under frequency	38
A.2.6	Functions set around current, voltage and frequency	38
A.2.7	Other functions	39
Annex B	(informative) Environmental operating locations	40
B.1	Operating environment	40
B.2	Operating conditions	40
Bibliography		44

Figure 1 – Ports for measuring relays and protection equipment	13
Figure 2 – Binary output parameters	19
Figure A.1 – Settings selection criteria	36
Table 1 – Normal environmental conditions	16
Table 2 – Contact performance requirements	18
Table 3 – Hot and cold temperatures	20
Table 4 – Dry heat test – Operational	25
Table 5 – Cold test – Operational	26
Table 6 – Dry heat test, storage temperature	26
Table 7 – Cold test, storage temperature	27
Table 8 – Change of temperature test	27
Table 9 – Damp heat steady state test	28
Table 10 – Cyclic temperature with humidity test	28
Table 11 – Test reference conditions	30
Table 12 – Test overview	31
Table B.1 – Operating locations	40
Table B.2 – Climatic conditions	41
Table B.3 – Mechanical conditions	41
Table B.4 – EMC conditions	42
Table B.5 – Chemically active substance conditions	42
Table B.6 – Mechanically active substance conditions	42
Table B.7 – Biological conditions	43

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MEASURING RELAYS AND PROTECTION EQUIPMENT –**Part 1: Common requirements**

FOREWORD

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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 C37.2TM-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.