

All-or-nothing electrical relays

The European Standard EN 60255-1-00:1997 has the status of a British Standard

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Committees responsible for this British Standard

The General Electrotechnical Engineering Standards Committee, under whose direction this British Standard was prepared, consists of representatives from the following:

- British Approvals Service for Electric Cables Ltd.
- Associated Offices Technical Committee
- British Electrical and Allied Manufacturers' Association (BEAMA)
- British Radio Equipment Manufacturers' Association
- British Steel Corporation
- Department of Energy (Electricity)
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- Association of Manufacturers Allied to the Electrical and Electronic Industry (BEAMA)
- Cinematograph Exhibitors' Association of Great Britain and Ireland
- Control and Automation Manufacturers' Association (BEAMA)
- Greater London Council
- National Supervising Inspectorate
- Society of British Aerospace Companies Limited
- Telecommunication Engineering and Manufacturing Association (TEMA)
- The Transmission and Distribution Association (BEAMA)

This British Standard, having been prepared under the direction of the General Electrotechnical Engineering Standards Committee, was published under the authority of the Executive Board and comes into effect on 28 November 1980

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National foreword

This Part of BS EN 60255 has been prepared by Technical Committee EPL/94, and is the English language version of EN 60255-1-00:1997, published by the European Committee for Electrotechnical Standardization (CENELEC). It is identical with IEC 255-1-00:1975, *All-or-nothing electrical relays*, published by the International Electrotechnical Commission (IEC).

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled “International Standards Correspondence Index”, or by using the “Find” facility of the BSI Standards Electronic Catalogue.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 32, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

English version

All-or-nothing electrical relays

(IEC 255-1-00:1975)

Relais électriques de tout-ou-rien
(CEI 255-1-00:1975)

Elektrische Schaltrelais
(IEC 255-1-00:1975)

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B-1050 Brussels

Foreword

The text of the International Standard IEC 255-1-00:1975, prepared by IEC TC 94, All-or-nothing electrical relays, was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 60255-1-00 on 1996-10-01 without any modification.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1997-09-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 1997-09-01

Endorsement notice

The text of the International Standard IEC 255-1-00:1975 was approved by CENELEC as a European Standard without any modification.

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1 General

1.1 Scope

This standard is applicable to all-or-nothing electrical relays.

It applies only to relays in a new condition having contacts in their output circuit.

When such relays incorporate in their energizing circuits static devices (such as amplifiers, rectifiers, etc.) this standard shall, if necessary, be supplemented by special requirements.¹⁾

It is applicable to relays used in many of the electrotechnical fields, covered by the IEC. For special applications (marine, aeronautical, space, explosive atmospheres, etc.), it may be amplified by means of special standards.

It does not purport to cover the requirements of relays used in telephony and telegraphy. Other standards dealing with these and similar types of relays are under consideration.

It does not apply to relays used for signalling and blocking systems for railways.

NOTE Attention is drawn to the fact that other IEC publications are concerned with similar apparatus used with, or analogous to, relays. In so far as complete co-ordination has not yet been achieved between the different requirements covering such different, but associated, fields of application, it may be necessary to refer to other relevant IEC publications. This comment applies, in particular, to the publications for low-voltage switchgear and control equipment.

1.2 Object

The object of this standard is to state for all-or-nothing electrical relays:

- 1) Terms and definitions used (Clause 2).
- 2) Recommended values (Clause 3).
- 3) Permissible maximum temperatures (Clause 4).
- 4) Accuracy of the specified times (Clause 5).
- 5) Mechanical and electrical requirements which the relays shall fulfil (Clauses 6 to 9).
- 6) Test methods to be applied (Clause 10).
- 7) Data and marking (Clause 11).

2 Terms and definitions

For the purpose of this standard, the following terms and definitions shall apply.

NOTE For definitions of general terms used in this standard, reference should be made to the IEC International Electrotechnical Vocabulary (I.E.V.).

2.1 Fundamental terms

2.1.1

electrical relay

a device designed to produce sudden, pre-determined changes in one or more electrical output circuits, after the appearance of certain conditions in the electrical input circuits controlling the device

NOTE 1 The term “relay” shall be restricted to a relay unit having only a single relaying function between its input circuits and its output circuits.

NOTE 2 The term “relay” includes all the additional components which are necessary for its specified operation.

NOTE 3 The adjective “electrical” can be deleted when no ambiguity may occur.

2.1.2

all-or-nothing relay

an electrical relay which is intended to be energized by a quantity, the value of which is either:

- higher than that at which it picks up (Sub-clause 2.3.3),
- or lower than that at which it drops out (Sub-clause 2.3.4).

NOTE In certain fields all the relays being all-or-nothing relays, the adjective “all-or-nothing” is omitted.

¹⁾ Requirements relevant to relays incorporating static devices are under consideration.

2.1.3

specified-time relay

an electrical relay of which one or more of the times which characterize it (e.g. operating time) are subject to specified requirements, in particular concerning accuracy

2.1.4

non-specified-time relay

an electrical relay for which the times are not subject to any accuracy specification

2.1.5

electromechanical relay

a relay in which the designed response is developed by the relative movement of mechanical elements under the action of an electrical current in the input circuit(s)

2.1.6

static relay

a relay in which the designed response is developed by electronic, magnetic, optical or other components, without mechanical motion

2.1.7

static relay with output contact

a static relay having a contact in one or more of its output circuits

2.1.8

monostable relay

a relay which, having responded to an input energizing quantity and having changed its condition, returns to its previous condition when the quantity is removed

2.1.9

bistable relay

a relay which, having responded to an input energizing quantity and having changed its condition, remains in that condition after the quantity is removed

another appropriate energization is required to change its condition

2.2 Terms relating to energization (input and auxiliary)

2.2.1

energizing quantity

an electrical quantity (either current or voltage) which, alone or in combination with other such quantities, applied to a relay under specified conditions enables it to fulfil its purpose

2.2.2

input energizing quantity

for an all-or-nothing relay: an energizing quantity to which the relay is designed to respond when the quantity is applied under specified conditions

2.2.3

auxiliary energizing quantity

any energizing quantity other than the input energizing quantity(ies)

2.2.4

to energize a relay

to apply to a relay one or more of its energizing quantities

NOTE The presence of any one energizing quantity may or may not be sufficient to produce the required function of the relay. Consequently, it is necessary to define all the conditions of energization (the method, magnitude, phase displacement, etc.).

2.2.5

input circuit

the whole of the electrical parts within a relay (including, if any, those parts intentionally coupled by inductive or capacitive means) which are connected to those terminals to which a given input energizing quantity is applied

2.2.6**auxiliary circuit**

the whole of the electrical parts within a relay (including, if any, those parts intentionally coupled by inductive or capacitive means) which are connected to those terminals to which a given auxiliary energizing quantity is applied

2.2.7**rated value of an energizing quantity**

the value of an energizing quantity to which some of the specified characteristics are referred

2.2.8**limiting continuous thermal withstand value of an energizing quantity**

the highest value (r.m.s. if a.c.) of an energizing quantity that a relay can withstand continuously, and under specified conditions, while satisfying the temperature-rise requirements

2.2.9**limiting short-time thermal withstand value of an energizing quantity**

the highest value (r.m.s. if a.c.) of an energizing quantity that a relay can withstand under specified conditions for a specified short time without permanent degradation of the specified characteristics due to overheating

2.2.10**limiting dynamic value of an energizing quantity**

the highest value of an energizing quantity that a relay can withstand under specified conditions of waveform and duration without permanent degradation of the specified characteristics due to the resultant dynamic effect

2.2.11**operative range of an input energizing quantity of an all-or-nothing relay**

the range of values of the given input energizing quantity for which the relay, under specified conditions, is able to perform its intended function(s) according to the specified requirements

2.2.12**operative range of an auxiliary energizing quantity of a relay**

the range of values of the given auxiliary energizing quantity for which the relay, under specified conditions regarding both the input and the auxiliary energizing quantities, is able to perform its intended function(s) according to the specified requirements

2.2.13**rated power of an energizing circuit****rated burden of an energizing circuit**

the power, expressed in watts if d.c. and in voltamps if a.c., consumed under the reference conditions (Sub-clause 2.4.3) by a given energizing circuit of a relay and determined under specified conditions

2.2.14**rated impedance of an energizing circuit**

the value of the impedance (in magnitude and phase angle) of a given energizing circuit of a relay, determined under specified conditions

2.3 Terms relating to conditions and operation of a relay**2.3.1****unenergized condition²⁾**

the specified condition of an unenergized monostable relay

2.3.2**energized condition²⁾**

the specified condition(s) of an appropriately energized monostable relay

²⁾ This term is independent of the functions of the relay.

**2.3.3
to pick up³⁾**

a monostable relay picks up when it changes from the unenergized condition to an energized condition

**2.3.4
to drop out³⁾**

a monostable relay drops out when it changes from an energized condition to the unenergized condition

2.3.5 to change over³⁾

a monostable relay changes over when it picks up or drops out

a bistable relay changes over when it passes from one condition to the other condition (Sub-clause **2.3.15**)

**2.3.6
to cycle³⁾**

a monostable relay cycles when it picks up and then drops out or vice versa

a bistable relay cycles when it passes from its A condition (Sub-clause **2.3.15**) to its B condition and then from its B condition to its A condition or vice versa

**2.3.7
initial condition⁴⁾**

the specified condition which the relay leaves in order to complete its designated function in a given output circuit

**2.3.8
operated condition⁴⁾**

the condition of a relay as long as the designated function is completed in a given output circuit

**2.3.9
to start⁴⁾**

a relay starts at the instant it leaves an initial condition

**2.3.10
to switch⁴⁾**

a relay switches at the instant it completes the designated function in a given output circuit

**2.3.11
to reset⁴⁾**

a relay resets when it re-attains an initial condition

**2.3.12
to disengage⁴⁾**

a relay disengages at the instant it terminates a function previously effected in a given output circuit

**2.3.13
to operate⁴⁾**

a relay operates when sequentially:

- it starts,
- it passes from an initial condition toward the prescribed operated condition, and
- it switches.

**2.3.14
to return⁴⁾**

a relay returns when sequentially:

- it disengages,
- it passes from an operated condition toward the prescribed initial condition, and

³⁾ This term is independent of the functions of the relay.

⁴⁾ This term depends on a given function of the relay. It is only applicable to measuring relays and specified-time all-or-nothing relays.