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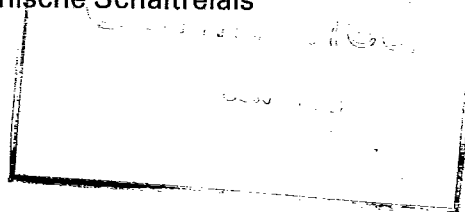
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Harmonized system of quality assessment for electronic components

Generic specification : Electromechanical all-or-nothing relays

Système harmonisé d'assurance de la qualité des composants électroniques
Spécification générique: relais électromécaniques de tout-ou-rien

Harmonisiertes Gütebestätigungssystem für Bauelemente der Elektronik
Fachgrundspezifikation: elektromechanische Schaltrelais



National foreword

This British Standard has been prepared under the direction of the Electronic Components Standards Committee. It is identical with CENELEC Electronic Components Committee (CECC) 16000 'Harmonized system of quality assessment for electronic components. Generic specification: Electromechanical all-or-nothing relays'.

This generic specification gives the test and measurement procedures which may be selected by specification writers in conjunction with the relevant sectional and blank detail documents to prepare detail specifications for electromechanical all-or-nothing relays. This specification also gives the quality assessment procedures and relevant terminology.

This standard is a harmonized specification within the CECC system. The existing non-harmonized British Standard BS 9150 'Electrical relays of assessed quality: generic data and methods of test' will remain in force for the time being because of current approvals within the BS 9000 scheme.

NOTE. *Earthing of the neutral conductor.* If the power supply referred to in 5.5.4.2 and 5.5.4.3 is taken directly from the public supply, care should be taken to ensure that the local supply regulations allow the neutral to be earthed. If this is not the case an isolating transformer will be required.

Terminology and conventions. The text of the CECC specification has been approved as suitable for publication, without deviation, as a British Standard. Some terminology and certain conventions are not identical with those used in British Standards; attention is especially drawn to the following.

The comma has been used throughout as a decimal marker. In British Standards it is current practice to use a full point on the baseline as the decimal marker.

Cross-references. The British Standard harmonized with CECC 00100 is BS E9000 'General requirements for electronic components of assessed quality harmonized with the CENELEC Electronic Components Committee System' Part 1 'Basic rules'. The British Standard harmonized with CECC 00100, 00107 and 00109 is BS E9000 : Part 2 'Rules of procedure'. IEC 117 substantially agrees in technical content with BS 3939 'Graphical symbols for electrical power, telecommunications and electronics diagrams'.

IEC 255 is a multipart standard. Those Parts of it relevant to this standard are to be published as identical British Standards, with the exception of Part 7 which is the IEC counterpart to this standard, less the quality assurance procedures.

International standard	Corresponding British Standard
ISO 1000-1973	BS 5555 : 1976 SI units and recommendations for the use of their multiples and of certain other units (Identical)
IEC 60	BS 923 : 1972 Guide on high-voltage testing techniques (Technically equivalent)
IEC 68	BS 2011 Basic environmental testing procedures (Identical)
IEC 144 : 1963	BS 5420 : 1977 Specification for degrees of protection of enclosures of switchgear and controlgear for voltages up to and including 1000 V a.c. and 1200 V d.c. (Identical)
IEC 410 : 1973	BS 6001 : 1972 Sampling procedures and tables for inspection by attributes (Technically equivalent)
IEC 443 : 1974	BS 5148 : 1975 Method for specifying the performance of stabilized power supply apparatus (Technically equivalent)
CECC 00006 : 1973	BS E9006 : 1976 Harmonized system of quality assessment for electronic components. Basic specification: Environmental test procedures (Identical)
CECC 00007 : 1973	BS E9007 : 1975 Harmonized system of quality assessment for electronic components. Basic specification: Sampling plans for inspection by attributes (Identical)

Related British Standards for IEC 50 (Chapter 446) and IEC 27-1 are BS 4727 'Glossary of electrotechnical, power, telecommunication, electronics, lighting and colour terms' Part 1 : Group 03 'Relay terminology' and BS 1991 'Letter symbols, signs and abbreviations' Part 6 'Electrical science and engineering', respectively.

NOTE. *Textual errors.* The heading 'Forward' should be read as 'Foreword'.

In 3.2.1 and 3.2.2, 'monstable' should be read as 'monostable'.

In the note to figure 6, 'following values' should be read as 'following ratios'.



European Committee for Electrotechnical Standardization (CENELEC)
Cenelec Electronic Components Committee

CECC

English version

Harmonized System of Quality Assessment for
Electronic Components

GENERIC SPECIFICATION:
**ELECTROMECHANICAL
ALL-OR-NOTHING
RELAYS**

Système Harmonisé d'Assurance de la Qualité
des Composants Electroniques

SPECIFICATION GENERIQUE:
**RELAIS
ELECTROMECHANIQUES
DE TOUT-OU-RIEN**

Harmonisiertes Gütebestätigungssystem für
Bauelemente der Elektronik

FACHGRUNDSPEZIFIKATION:
**ELEKTROMECHANISCHE
SCHALTRELAIS**



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FORWARD

The CENELEC Electronic Components Committee (CECC) is composed of those member countries of the European Committee for Electrotechnical Standardization (CENELEC) who wish to take part in a harmonized System for electronic components of assessed quality.

The object of the System is to facilitate international trade by the harmonization of the specifications and quality assessment procedures for electronic components, and by the grant of an internationally recognized Mark, or Certificate, of Conformity. The components produced under the System are thereby accepted by all member countries without further testing.

This document has been formally approved by the CECC, and has been prepared for those member countries taking part in the System who wish to issue national harmonized specifications for ELECTROMECHANICAL ALL-OR-NOTHING RELAYS. It should be read in conjunction with document CECC 00 100: Basic Rules (1974).

At the date of printing of this document the member countries of the CECC are Belgium, Denmark, Germany, France, Ireland, Italy, the Netherlands, Norway, Sweden, Switzerland, the United Kingdom, and copies of it can be obtained from the addressees shown on the inside cover.

PREFACE

This generic specification was prepared by CECC Working Group 16 : "Relays".

In accordance with the requirements of document CECC 00 100 it is based, wherever possible, on the Recommendations of the International Electrotechnical Commission and in particular on IEC Publication 255-7 : Electrical relays. Part 7 : Test and measurement procedures for electromechanical all-or-nothing relays.

The text of this generic specification was circulated to the CECC for voting in the documents listed below and was ratified by the CECC for printing as a CECC Specification.

Document

Voting date

CECC(Secretariat)595
CECC(Secretariat)595A

20 August 1977

The layout of this specification deviates from that given in CECC 00 400, mainly by the insertion of a "Section THREE: Terms and Definitions" which is additional to the terminology references given in Section TWO: General.

This change in layout was made originally to give closer agreement with IEC 255-7.

SECTION 1 - SCOPE

This generic specification applies to electromechanical all-or-nothing relays of assessed quality.

SECTION 2 - GENERAL2.1 Order of precedence

Where any discrepancies occur for any reasons, documents shall rank in the following order of authority:

- 1 the detail specification,
- 2 the sectional specification,
- 3 the generic specification,
- 4 document CECC 00 100, or any other international documents (for example, of the IEC) to which reference is made.

The same order of precedence shall apply to equivalent national documents.

2.2 Related documents

Reference to the following documents is made in this specification.

- ISO 1000 (1973) SI units and recommendations for the use of their multiples and of certain other units.
- IEC 27-1 (1971) Letter symbols to be used in electrical technology. General.
- IEC 50 - International Electrotechnical Vocabulary.
- IEC 60 - High voltage test techniques.
- IEC 68 - Basic environmental testing procedures. (see CECC 00 006)
- IEC 117 - Recommended graphical symbols.
- IEC 144 (1963) Degrees of protection of enclosures for low-voltage switchgear and controlgear.
- IEC 255 - Electrical relays.
- IEC 410 (1973) Sampling plans and procedures for inspection by attributes. (see CECC 00 007).
- IEC 443 (1974) Stabilised supply apparatus for measurement.

Secretariat Note: At the date of publication of this specification the publication state of IEC 60 and IEC 255 is:

- IEC 60-1 (1973) General definitions and test requirements.
- IEC 60-2 (1973) Test procedures.
- IEC 60-3 (1976) Measuring devices.
- IEC 60-4 (1977) Application guide for measuring devices.
- IEC 255-0-20 (1974) Contact performance of electrical relays.
- IEC 255-1-00 (1975) All-or-nothing electrical relays.
- IEC 255-3 (1971) Single input energizing quantity measuring relays with non-specified time or with independent specified time.
- IEC 255-4 (1976) Single input energizing quantity measuring with dependent specified time.
- IEC 255-5 (1977) Insulation tests for electrical relays.
- IEC 255-6 (1978) Measuring relays with more than one input energizing quantity.
- IEC 255-7 (1978) Test and measurement procedures for electromechanical all-or nothing relays.

Documents

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- CECC 00 006 (1973) Basic Specification: Basic environmental testing procedures.
- CECC 00 007 (1973) Basic Specification: Sampling plans and procedures for inspection by attributes.
- CECC 00 100 (1974) Basic Rules.
- CECC 00 107 (1977) Rule of Procedure 7: Quality assessment Procedures (with amdt 1 to RP 7).
- CECC 00 109 (1974) Rule of Procedure 9: Certified Test Records.

2.3 Units, symbols, and terminology

Units, graphical symbols, letter symbols and terminology shall, whenever possible, be taken from the following documents:

- | | |
|----------|---|
| ISO 1000 | SI units and recommendations for the use of their multiples and of certain other units. |
| IEC 27-1 | Letter symbols to be used in electrical technology, Part 1: General |
| IEC 50 | International Electrotechnical Vocabulary |
| IEC 117 | Recommended graphical symbols |

2.4 Preferred values

Preferred values shall be stated in the sectional specifications. They shall, as far as possible, adopt the relevant standard values of IEC-Publication 255.

2.5 Marking

The sectional or detail specifications shall indicate the identification criteria and other information to be shown on the relay and/or packing. The letter or colour code shall be described in full or reference made to the appropriate specifications. The order of priority for marking small relays shall be specified.

The marking shall, as a minimum, consist of

- the trade mark or the manufacturer's name
- the relay type and variants' code
- the coded date of manufacture, quantised by months or less.

SECTION 3 - TERMS AND DEFINITIONS

The following paragraphs contain specific additional terminology applicable to electromechanical all-or-nothing relays, and shall be included in each national harmonized specification.

3.1 Types of relays

3.1.1 Electromechanical relay

An electrical relay, in which the designed response is developed by the relative movement of mechanical elements under the action of a current in the input circuits.

3.1.2 All-or-nothing relay

An electrical relay, which is intended to be energized by a quantity, whose value is either:

- higher than that at which it operates
- or lower than that at which it releases.

Note: The adjective "all-or-nothing" can be deleted when no ambiguity may occur.

3.1.3 Monostable relay

An electrical relay which, having responded to an input energizing quantity (or characteristic quantity) and having changed its condition, returns to its previous condition when the quantity is removed.

3.1.4 Bistable relay

An electrical relay which, having responded to an input energizing quantity (or characteristic quantity) and having changed its condition, remains in that condition after the quantity has been removed. Another appropriate further energization is required to make it change over.

3.1.5 Polarized relay

A relay, the change of condition of which depends upon the direction of its input energizing quantity (or quantities).

3.1.6 Non-polarized relay

A relay, the change of condition of which does not depend upon the direction of its input energizing quantity (or quantities).

3.2 Functions of a relay

3.2.1 Release condition

For a monstable relay, the specified condition of the relay when it is not energized. For a bistable relay, the conventional condition as declared by the manufacturer.

3.2.2 Operate condition

For a monstable relay, the specified condition of the relay when it is appropriately energized.

For a bistable relay, the alternative condition to the release condition as declared by the manufacturer.

3.2.3 To operate

A relay operates when it changes from its release condition to its operate condition.

3.2.4 To release

A relay releases when it changes from its operate condition to its release condition.

3.2.5 To change over

A relay changes over when it operates or releases.

3.2.6 To cycle

A relay cycles when it operates and then releases, or vice-versa.

3.2.7 To revert

For a particular polarized relay being in an operate condition, to change from this condition to the release condition by increasing the value of the energizing quantity.

3.2.8 To revert reverse

For a particular bistable polarized relay being in a release condition by an appropriate energization, to change from this condition to the operate condition by increasing the value of this energizing quantity.

3.3 Types of contacts

3.3.1 Make contact

A contact which is closed when the relay is in its operate condition and which is open when the relay is in its release condition.

3.3.2 Break contact

A contact which is open when the relay is in its operate condition and which is closed when the relay is in its release condition.

3.4 Prefixes for the values applicable to relays

Values may be defined as rated, actual ("just"), test ("must") or characteristic value and identified as such by using one of these words as a prefix. The prefixes are also applicable to timing values.

3.4.1 Rated value

Value of a quantity assigned, generally by a manufacturer, for a specified operating condition of a relay.

3.4.2 Actual ("just") value

Value of a quantity determined by measurement on a single relay, when it just performs a specified function.

3.4.3 Test ("must") value

Value of a quantity with which, during tests, the relay is required to perform or not to perform a specified function.

3.4.4 Characteristic value

Value of a quantity with which, throughout its life-time or a specified number of cycles, the relay is required to comply with a specified requirement.

3.5 Energization values

3.5.1 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.

3.5.2 Rated value of an energizing quantity

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

3.5.3 Actual ("just") value of an energizing quantity

Value of an energizing quantity determined by measurement on a single relay, when it just performs a specified function.

3.5.4 Test ("must") value of an energizing quantity

Value of an energizing quantity at which, during tests, the relay is required to perform or not to perform a specified function.

3.5.5 Characteristic value of an energizing quantity

Value of an energizing quantity with which, throughout its lifetime or a specified number of cycles, the relay is required to comply with a specified requirement.

3.5.6 Operative range of an energizing quantity

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

For the following terms refer also to Figures 1 to 5 which show the sequential functions of relays covered by the definitions.

3.5.7 Magnetic preconditioning value

Value of the energizing quantity at which the relay attains a defined magnetic condition.

Notes: 1. For polarized relays, distinction is made between preconditioning in forward (operate) direction, and preconditioning in reverse direction.

2. For bistable relays, preconditioning may also be used to set the relay to a defined position.

3.5.8 Non-operate value

Value of the energizing quantity at which a relay does not operate.

3.5.9 Operate value

Value of the energizing quantity at which a relay operates.

3.5.10 Non-release value

Value of the energizing quantity at which a relay does not release.

3.5.11 Release value

Value of the energizing quantity at which a relay releases.

3.5.12 Non-revert value

Value of the energizing quantity exceeding the operate value at which a particular polarized relay does not revert.

3.5.13 Reverse non-revert value

Value of the energizing quantity exceeding the release value, at which a particular bistable polarized relay does not revert reverse.

3.5.14 Reverse polarity value

Value of the energizing quantity of reverse polarity at which a polarized monostable relay does not operate.

3.6 Electrical properties of contacts

3.6.1 Contact current

The current which a relay contact carries before opening or after closing.

3.6.2 Contact voltage

The voltage between the contact members before closing or after opening.

3.6.3 Limiting continuous current

The highest value of the current (r.m.s. if a.c.), which a previously closed contact circuit is capable of carrying continuously.

3.6.4 Contact noise

The spurious voltage which appears across the terminations of a closed contact.

3.7 Application categories of contacts

3.7.1 Category 0 contact

A contact characterized by a maximum contact voltage of 30 mV, and a maximum contact current of 10 mA.

3.7.2 Category I contact

A contact characterized by a contact voltage between 30 mV and 60 V, and a contact current between 10 mA and 0,1 A.

3.7.3 Category II contact

A contact characterized by a contact voltage between 5 and 250 V, and a contact current between 0,1 and 1 A.

3.7.4 Category III contact

A contact characterized by a contact voltage between 5 and 600 V, and a contact current between 0,1 and 100 A.

Note: A contact may have the characteristics of more than one category.

3.8 Mechanical properties of contacts

3.8.1 Contact gap

The gap between the contact tips (points) under specified conditions when the contact circuit is open.

3.8.2 Contact force

The force which two contact tips (points) exert against each other in the closed position under specified conditions.

3.9 Terms relating to times

The operate time, release time, reverse operate time, transfer time and bridging time, as defined hereunder, do not include bounce times.

The operate time covers the closing time of a make contact and the opening time of a break contact.

The release time covers the opening time of a make contact and the closing time of a break contact.

3.9.1 Operate time

The interval of time between the application of the operate value and the first closing (or opening) of the contact circuit.

3.9.2 Release time

The interval of time between the application of the release value and the first opening (or closing) of the contact circuit.

3.9.3 Transfer time

For a break-before-make change over contact, the time interval during which both contact circuits are open.

3.9.4 Bridging time

For a make-before-break change over contact, the time interval during which both contact circuits are closed.

3.9.5 Bounce time

For a contact which is closing (opening) its circuit, the time interval between the instant when the contact circuit first closes (opens) and the instant when the circuit is finally closed (opened).

3.9.6 Time to stable closed condition

The time interval between the instant when a specified value of the energizing quantity is applied and the instant when a contact circuit fulfills specified requirements.

3.9.7 Minimum time of operate energization

Minimum duration of application of rated operate value required to ensure that the contact circuit fulfills specified requirements.

3.9.8 Contact time difference

For a relay having several contacts of the same type, the difference between the maximum value of the operate (release) time and the minimum value of the operate (release) time.

SECTION 4 - QUALITY ASSESSMENT PROCEDURES

4.1 Primary stage of manufacture

The primary stage of manufacture shall be defined in each sectional specification.

4.2 Structurally similar components

The detail specification shall define those relays within its scope which may be considered as structurally similar.

4.3 Qualification approval requirements

(see CECC 00107)

The manufacturer shall comply with:

- 4.3.1 the general requirements of the basic rules governing qualification approval
and

- 4.3.2 the requirements for the primary stage of manufacture contained in 4.1.

In addition, the manufacturer shall comply with the requirements set forth in the sectional and detail specifications.

4.4 Quality conformance inspection

(see CECC 00107)

The sectional specification shall prescribe the test schedule which shall be included in each detail specification for those relays covered by the scope of the sectional specification.

This schedule shall also specify the division into subgroups for the purpose of lot-by-lot and periodic inspection.

A sectional specification may specify more than one schedule which can be applied to differing categories or levels.

4.5 Division into groups

The detail specification shall show the order in which the tests or conditions in the subgroup shall be carried out where this order may affect the test results.

The detail specification shall also indicate wherever any particular order of testing in any subgroup is to be observed.

Where a subgroup contains a destructive test, this shall either be stated in full or the symbol "D" shall be placed alongside of the title of the subgroup in the schedule of inspection requirements in the detail specification.

4.5.1 Division into subgroups

Division is made according to the relative importance of the feature to the overall function of the relay.

4.6 Resubmission of rejected lots

No requirements at present.

4.7 Certified test records

The procedure given in CECC 00109 shall apply, and these certified test records shall then contain the relevant information prescribed in the blank detail specification.

Unless otherwise stated, certified test records should give attributes information for tests in the subgroups covered by periodic inspection, without references to the parameter for which rejection was made.

4.8 Delivery of relays subjected to destructive tests or non-destructive tests

Relays subjected to destructive tests shall not be included in the lot for delivery. Relays subjected to non-destructive tests may be delivered provided they are re-tested to Group A requirements and satisfy them.

4.9 Delayed delivery

Relays which have been held by the manufacturer for a period exceeding 12 months following acceptance inspection, shall be re-inspected as prescribed in the detail specification, unless another period is specified therein.

If this has been done for the complete lot, no further retesting before delivery is needed for another period of one year or as otherwise specified in the detail specification.

4.10 Supplementary procedure for deliveries

When this has been nationally recognised, manufacturers may, at their discretion, supply relays that have met a higher assessment level against orders for a lower assessment level.

4.11 Unchecked parameters

When, in detail specifications, supplementary information is given, this shall not be the subject of inspection.

4.12 Release for delivery before the completion of Group B tests

When the conditions of IEC-Publication 410 for reduced inspection have been satisfied for all Group B tests, the manufacturer is permitted to release the relays before the completion of such tests.

SECTION 5 : TEST AND MEASUREMENT PROCEDURES

5.1 General

The sectional or blank detail specifications shall contain tables showing the tests to be made, which measurements are to be made before and after each test or sub-group of tests, and the sequence in which they shall be carried out.

5.2 Alternative methods

Measurements shall preferably be carried out by using the methods specified. Any other method giving equivalent results may be used except in case of dispute.

Note: By "equivalent" is meant that the value of the characteristic established by such other method falls within the specified limits when measured by the specified method.

5.3 Precision of measurement

The limits quoted in detail specifications are true values. Measurement inaccuracies shall be taken into account when evaluating the results. The usual precautions should be taken to reduce measurement errors to a minimum.

5.4 Requirements in detail specifications

If the technical requirements of the generic specification relative to inspection are not entirely suitable (either for technical reasons or because of a special application) for the relay described in the detail specification, the latter shall set out clearly the various amendments which are to be made to these requirements.

5.5 Standard conditions for testing

5.5.1 Unless otherwise specified, all tests shall be carried out under the standard atmospheric conditions for testing as specified in Clause 5.3 of IEC Publication 68.1, i.e.:

Temperature	15 °C	to	35 °C
Relative humidity	45 %	to	75 %
Air pressure	86 kPa	to	106 kPa
	(860	to	1060 mbar)