

**SLOVENSKI  
STANDARD**

**SIST EN 116500:2002**

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Sectional Specification: Electromechanical all-or-nothing TELECOM relays of assessed quality

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Descriptors: Quality, electronic components, TELECOM relays

English version

Sectional specification:  
Electromechanical all-or-nothing TELECOM relays of assessed  
quality

Spécification intermédiaire:  
Relais électromécaniques de tout-ou-rien  
TELECOM soumis au régime d'assurance de la  
qualité

Rahmenspezifikation:  
Gütebestätigte elektromechanische  
TELEKOM-Relais

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This European Standard was approved by the CENELEC Electronic Components Committee (CECC) on 13 February 1992. CENELEC members are bound to comply with CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the General Secretariat of the CECC or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CECC General Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom. The membership of the CECC is identical, with the exception of the national electrotechnical committees of Greece, Iceland and Luxembourg.

**CECC**

CENELEC Electronic Components Committee  
Comité des Composants Electroniques du CENELEC  
CENELEC- Komitee für Bauelemente der Elektronik

General Secretariat: Gartenstr. 179, W- 6000 Frankfurt/Main 70

**Preface**

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 acceptable in all member countries without further testing.

This specification has been formally approved by the CECC, and has been prepared for those 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 the current regulations for the CECC system.

**Foreword**

This specification was prepared by CECC WG 16 'Relays'.

It is based, wherever possible, on the publications of the International Electrotechnical Commission (IEC).

The CECC voting procedure has been concluded on draft prEN 116500 circulated as document CECC (Secretariat) 2777/4.91 and has resulted in a positive vote.

The voting report [document CECC (Secretariat) 3009/1.92] has been submitted for formal approval and has been accepted. The reference document was approved by CECC as EN 116 500 : 1992 on 13 February 1992.

The following dates were fixed:

- latest date of announcement of the EN at national level (doa) 1993-02-05
- latest date of publication of an identical national standard (dop) 1993-08-05
- latest date of withdrawal of conflicting national standards (dow) 1993-08-05

**Contents**

	Page
Preface	2
Foreword	2
<b>Section 1. Scope</b>	<b>3</b>
<b>Section 2. General</b>	<b>3</b>
2.1 Related documents	3
2.2 Terms and definitions	3
2.3 Preferred values	4
2.4 Marking	5
<b>Section 3. Quality assessment procedures</b>	<b>6</b>
3.1 Primary stage of manufacture	6
3.2 Structurally similar relays	6
3.3 Subcontracting	6
3.4 Qualification approval procedures	6
3.5 Quality conformance inspection	7
3.6 Test schedule	7
3.7 Order of tests	7
<b>Section 4. Preparation of blank detail and detail specifications</b>	<b>8</b>
<b>Section 5. Test schedule</b>	<b>9</b>
5.1 Test sequence	9
5.2 Types of relays, based upon environmental protection	9
5.3 Contact application	9
5.4 Notes	9
<b>Table 1</b>	<b>11</b>

## Section 1 Scope

This sectional specification applies to electromechanical all-or-nothing telecom relays of assessed quality. Relays according to this standard are provided for the operation in telecommunication applications. However, as electromechanical all-or-nothing relays they are suitable also for particular industrial and other applications.

It selects from the generic specification EN 116 000 - 1 : 1992 (CECC 16 000 / I, 1990) and other sources the appropriate methods of tests to be used in detail specifications derived from this specification, and contains basic test schedules to be used in the preparation of such specifications. Detailed test schedules are contained in the blank detail specifications supplementary to this specification.

## Section 2 General

### 2.1 Related documents

CECC 00 114 / I (1990)	Quality Assessment Procedures, Part I: Approval of manufactures and other organizations
CECC 00 114 / II (1991)	Quality Assessment Procedures, Part II: Qualification Approval of electronic components
CECC 00 800 (1986)	Code of practice on the use of the ppm approach in association with the CECC system
EN 116 000 - 1 : 1992 (CECC 16 000 / I, 1990)	Generic specification, electromechanical all-or-nothing relays, Part I: General
IEC 255 -1- 00 (1975)	All-or-nothing electrical relays
IEC 255 - 10 (1979)	Application of the IEC quality assessment system for electronic components to all-or-nothing relays

### 2.2 Terms and definitions

In addition to the terms and definitions in EN 116 000 - 1 : 1992 (CECC 16 000 / I, 1990) the following apply to electromechanical all-or-nothing telecom relays.

#### 2.2.1 Types of relays

Types of relays as defined in EN 116 000 - 1 : 1992 (CECC 16 000 / I, 1990).

Note - The most frequent types of electromechanical all-or-nothing telecom relays are the following ones:

monostable - non-polarized

monostable - polarized

bistable - polarized

#### 2.2.2 Types of contacts

1) Change-over break-before-make contact

A change-over contact, one contact circuit of which breaks before the other makes.

2) Change-over make-before-break contact

A change-over contact, one contact circuit of which makes before the other breaks.

### 2.2.3 Contact fault and contact failure

#### 1) Contact fault due to contact-circuit resistance

The occurrence of a contact fault is assumed when the contact-circuit resistance of a closed contact exceeds the maximum value stated in the detail specification.

#### 2) Contact fault due to non-opening of the contact circuit (e.g. "contact sticking")

The occurrence of a contact fault due to the fact that the contact does not open is assumed when the resistance of an open contact assembly falls below the specified minimum value stated in the detail specification.

#### 3) Contact failure

The occurrence of a contact failure is assumed when the number of faults due to contact-circuit resistance or / and of faults due to non-opening of the contact circuit exceeds the number of faults stated in the detail specification, with reference to a single tested contact.

### 2.2.4 Relay fault, relay failure and relay defect

#### 1) Relay fault

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The state of a relay characterised by the inability to perform a required function. A fault persists for a limited time after which the relay recovers the ability to perform a required function without being subjected to any corrective maintenance.

#### 2) Relay failure

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A failure occurs when the relay is unable to carry out its required function.

#### 3) Relay defect

Any deviation of a characteristic of a relay from the requirements.

Note 1 - The requirements may or may not be expressed in the form of a specification.

Note 2 - A defect may or may not affect the ability of a relay to perform a required function.

#### 4) Defective relay

A relay containing one or more defects.

## 2.3 Preferred values

The following paragraphs contain preferred values applicable to electromechanical all-or-nothing telecom relays.

### 2.3.1 Rated coil voltages

Preferred values d.c.: 3, 5, 6, 12, 24, 48 or 60 V

### 2.3.2 Contact-circuit resistance

- 1) Preferred values in initial condition: maximum 50, 100 or 200 milliohm
- 2) Preferred values during / after tests: maximum 0,5, 1 or 10 ohm
- 3) Preferred value for detecting faults due to non-opening of the contact circuit during tests: minimum 100 kohm
- 4) Voltage for detecting faults due to non-opening of the contact circuit during tests; preferred value: max. 24 V d.c.
- 5) Difference of contact-circuit resistance between different contact circuits in the same relay, preferred value: maximum 100 milliohm (initial condition).

### 2.3.3 Dielectric test

Preferred values in initial condition between opened contact circuits, between separate contact circuits, between contact circuits and coil(s), between all conductive parts and mass (if applicable) in accordance with Table I of IEC 255 - 5, test voltage series A:  
minimum 0,5 kV a.c. or 0,7 kV d.c;  
between separate windings (if applicable): minimum 0,25 kV a.c. or 0,35 kV d.c.

### 2.3.4 Impulse voltage test

- 1) Preferred voltages: 0,5, 1,0 or 1,5 kV
- 2) Preferred waveform: 10  $\mu$ s / 700  $\mu$ s
- 3) Preferred number of pulses (alternate positive and negative pulses): 10  
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- 4) Preferred frequency of pulses: 2 pulses / min

### 2.3.5 Insulation resistance

Preferred value: 1 000 megaohm at 500 V d.c. initial value

### 2.3.6 Number of operations determining electrical endurance

Preferred values: 10 000, 20 000, 50 000, 100 000, 200 000, 500 000, 700 000, 1 000 000, 1 600 000, 2 000 000, 5 000 000 or 10 000 000

### 2.3.7 Contact failure rate for test evaluation purposes

Preferred values: maximum  $10^{-5}$ ,  $10^{-6}$ ,  $10^{-7}$  or  $10^{-8}$  / contact / operation

## 2.4 Marking

Relays and their package supplied in accordance with detail specification covered by this specification shall be marked as follows:

### 2.4.1 Relay (minimum information)

- Manufacturer's name, logo or trade mark
- Relay type and variant code
- Coded date of manufacture, in terms of year / week or month

- CECC mark of conformity
- Identification of terminal no. 1 (if applicable)

#### 2.4.2 Package (minimum information)

- Manufacturer's name, logo or trade mark
- Detail specification reference if not marked on the relay
- Quantity
- Relay type and variant code
- Manufacturer's batch identification code
- CECC mark of conformity

### Section 3 Quality assessment procedures

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#### 3.1 Primary stage of manufacture

The primary stage of manufacture is the assembly of the electromotive part of the relay to the electric switching part of the relay.

NOTE - Important manufacturing steps are as follows:

- (1) Fabrication, heat treatment and plating of the component parts of the relay
- (2) Coil winding
- (3) Assembling of the electrical and electromechanical parts
- (4) Adjustment of the relay contacts, if applicable
- (5) High-temperature drying, gas backfilling and sealing of the relay, if applicable
- (6) Final measurements and periodic inspection of test groups A to C

#### 3.2 Structurally similar relays

Relays are considered structurally similar if having no other differences in design than in:

- (1) coil wire diameter and number of windings
- (2) types, numbers and material of contacts
- (3) rated coil and / or contact voltage(s)
- (4) mounting and terminal variants within the limits prescribed in the detail specification
- (5) biasing of the input circuit parts.

#### 3.3 Subcontracting

Preliminaries for subcontracting are as in CECC 00 114 / II, § 1.2.

#### 3.4 Qualification approval procedures

Qualification approval tests shall include all the tests prescribed in the detail specification and shall be performed by a schedule specifically prescribed in the detail specification.

The number of specimens for each sub-group is specified in the blank detail specification. As a general rule, a minimum of five specimens are required for each group of test.



### 3.5 Quality conformance inspection

#### 3.5.1 Formation of inspection lots

Inspection lots submitted to group A and B acceptance tests shall be formed in accordance with § 3.1 of CECC 00 114 / II and with the sampling plans and procedures given in IEC 410, except where production is too infrequent or too small for sampling plans to apply; in these cases inspection shall be 100%.

When sampling is carried out in accordance with IEC 410, the percent defective concept only shall be used. Stratified or representative sampling shall always be used to include all production lines and structurally similar relays in proportion to their respective quantities in the lot. Exceptions from proportionality may become necessary and shall be stated in the detail specification. Specimens shall be as representative as possible of the production.

The determination basis for the sample sizes from continuous production lines shall be stated in the blank detail specification.

#### 3.5.2 Periodic inspection

Fixed sample sizes for group C inspection shall be taken from a lot (or lots) which has (have) passed group A and B inspection during or at the end of the specified reference period.

### 3.6 Test schedule

#### 3.6.1 Test sequence

A test sequence shall consist of all tests listed in the detail specification. Where appropriate, the reference number of the tests are those of EN 116 000 - 1 : 1992 (CECC 16 000 / I, 1990) Generic Specification, Electromechanical all-or-nothing relays. Additional testing may be called for by the detail specification.

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#### 3.6.2 Groups A and B

The Inspection Level (IL) notation applies to all tests in one sub-group. A corresponding value / range of values of the Acceptable Quality Level (AQL) shall be given in the blank detail specification, and the authority preparing detail specifications shall choose the appropriate value, which then applies to all tests in one sub-group. Any given IL - AQL notations shall be interpreted such that the number of defectives allowable for acceptance is applicable to each test within a sub-group separately. However, the blank detail specification may prescribe this same IL for relays submitted to cumulative tests of the same sub-group.

#### 3.6.3 Group C

The blank detail specification shall prescribe for each sub-group:

- 1) Periodicity of each sub-group. If the same periodicity is applicable to all sub-groups, it shall be given at the beginning of the group test details.
- 2) The minimum sample size for each test (or group of tests) performed with the same relays and the acceptable number of defectives.

### 3.7 Order of tests

Quality conformance inspection is divided into two parts: that carried out lot by lot, on which the release of the individual lots is based, and that carried out on a periodic basis, which contains the time-consuming and more expensive tests.

When several tests are subsequently to be carried out on any one specimen or number of specimens, the following order shall apply, unless otherwise prescribed in the detail specification:

- a) A 100%-test with a screening or sorting function shall always precede any other non-destructive (ND) or destructive (D) test.
- b) Tests in groups other than 100%-test shall be performed in the sequence given in the blank detail specification. It shall be ensured that the effects of earlier tests are not liable to invalidate the results of the later tests (see 5.1).