

# INTERNATIONAL STANDARD

**IEC**  
**61811-50**

QC 160500

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## **Electromechanical all-or-nothing relays –**

### **Part 50:**

#### **Sectional specification –**

#### **Electromechanical all-or-nothing telecom relays of assessed quality**

*Relais électromécaniques de tout-ou-rien –*

*Partie 50:*

*Spécification intermédiaire –*

*Relais électromécaniques de tout-ou-rien télécom  
soumis au régime d'assurance de la qualité*



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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**ELECTROMECHANICAL ALL-OR-NOTHING RELAYS –****Part 50: Sectional specification –  
Electromechanical all-or-nothing telecom relays  
of assessed quality**

## FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The 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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International Standard IEC 61811-50 has been prepared by IEC technical committee 94: All-or-nothing electrical relays.

This second edition of IEC 61811-50 cancels and replaces the first edition published in 1997 and constitutes a technical revision.

The text of this standard is based on the following documents:

FDIS	Report on voting
94/144/FDIS	94/158/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

The QC number that appears on the front cover of this publication is the specification number in the IEC Quality Assessment System for Electronic Components (IECQ).

This publication has been drafted in accordance with the ISO/IEC Directives, Part 3.

The committee has decided that the contents of this publication will remain unchanged until 2007. At this date, the publication will be

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- withdrawn;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

Withdrawing

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## ELECTROMECHANICAL ALL-OR-NOTHING RELAYS –

### Part 50: Sectional specification – Electromechanical all-or-nothing telecom relays of assessed quality

## 1 General

### 1.1 Scope

This part of IEC 61811 is a sectional specification and applies to electromechanical all-or-nothing telecom relays of assessed quality. Relays according to this standard are provided for operation in telecommunication applications. However, as electromechanical all-or-nothing relays, they are also suitable for particular industrial and other applications.

This standard selects from IEC 61810-7 and other sources the appropriate methods of test 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.

### 1.2 Normative references

The following referenced documents are indispensable for the application 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 60062:1992, *Marking codes for resistors and capacitors*

IEC 60255-23:1994, *Electrical relays – Part 23: Contact performance*

IEC 60410:1973, *Sampling plans and procedures for inspection by attributes*

IEC 60695-2-2:1991, *Fire hazard testing – Part 2: Test methods – Section 2: Needle-flame test*

IEC 61709:1996, *Electronic components – Reliability – Reference conditions for failure rates and stress models for conversion*

IEC 61810-1:1998, *Electromechanical non-specified time all-or-nothing relays – Part 1: General requirements*

IEC 61810-5:1998, *Electromechanical non-specified time all-or-nothing relays – Part 5: Insulation co-ordination*

IEC 61810-7:1997, *Electromechanical all-or-nothing relays – Part 7: Test and measurement procedures*

IEC 61811-1:1999, *Electromechanical non-specified time all-or-nothing relays of assessed quality – Part 1: Generic specification*

QC 001002-3:1998, *Rules of Procedure of the IEC Quality Assessment System for Electronic Components (IECQ) – Part 3: Approval Procedures*

ISO 8601:2000, *Data elements and interchange formats – Information interchange – Representation of dates and times*

ISO 9001:2000, *Quality systems – Model for quality assurance in design, development, production, installation and servicing*

CECC 00016:1990, *Basic requirements for the use of statistical process control (SPC) in the CECC system*

CECC 00800:1986, *Code of practice on the use of the ppm approach in association with the CECC system*

### 1.3 Terms and definitions

For the purpose of this part of IEC 61811, the terms and definitions given in IEC 61810-7, as well as the following apply:

#### 1.3.1

##### types of relays

types of relays as defined in IEC 61810-7

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

- monostable: non-polarized;
- monostable: polarized;
- bistable: polarized.

#### 1.3.2

##### types of contacts

##### a) ~~change-over break-before-make contact~~

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

##### b) ~~change-over make-before-break contact~~

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

#### 1.3.3

##### contact fault and contact failure

##### a) ~~contact fault due to contact-circuit resistance~~

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

##### b) ~~contact fault due to non-opening of the contact circuit (e.g. contact sticking)~~

the occurrence 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

##### c) ~~contact failure~~

the occurrence 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



### 1.3.4

#### **relay fault, relay failure and relay defect**

##### **a) relay fault**

the state of a relay characterized 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

##### **b) relay failure**

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

##### **c) 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.

##### **d) defective relay**

relay containing one or more defects

### 1.4 Preferred values

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

#### 1.4.1 Rated coil voltages

Preferred values d.c.: 1,5; 3; 4,5; 5; 6; 9; 12; 24; 48 or 60 V.

#### 1.4.2 Contact-circuit resistance

a) Preferred values in initial condition: maximum 50, 100 or 200 m $\Omega$ .

b) Preferred values during/after tests: maximum 0,5; 1; 5; 10; 20 or 100  $\Omega$ .

c) Preferred value for detecting faults due to non-opening of the contact circuit during tests: minimum 100 k $\Omega$ .

d) Voltage for detecting faults due to non-opening of the contact circuit during tests; preferred maximum values: 0,03; 5; 6; 12; 24; 48 or 60 V d.c.

e) Difference of contact-circuit resistance between different contact circuits in the same relay, preferred value: maximum 100 m $\Omega$  (initial condition).

#### 1.4.3 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 IEC 61810-5.

a) Preferred voltages: 0,5; 0,8; 1,5; 2,5 kV a.c.

b) Preferred duration: 1 s or 60 s

#### 1.4.4 Impulse voltage test

a) Preferred voltages: 0,5; 1,0; 1,5; 2 or 2,5 kV.

b) Preferred waveform: 0,5  $\mu$ s/700  $\mu$ s, 1,2  $\mu$ s/50  $\mu$ s or 10  $\mu$ s/700  $\mu$ s.

c) Preferred number of pulses (alternate positive and negative pulses): 10.

d) Preferred frequency of pulses: 2 or 4 pulses/min.

#### 1.4.5 Insulation resistance

Preferred value: 1 000 M $\Omega$  at 500 V d.c. initial value.

#### 1.4.6 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; 10 000 000; 20 000 000 or 30 000 000.

#### 1.4.7 Contact failure rate for test evaluation purposes

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

### 1.5 Marking and documentation

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

#### 1.5.1 Marking of the relay

- a) Manufacturer's name, logo or trade mark.
- b) Relay type and variant code.
- c) Coded date of manufacture, in terms of year/week according to 1.5.3.
- d) IECQ in letters or IECQ mark of conformity.
- e) Identification of terminal No. 1.

#### 1.5.2 Marking of the package

- a) Manufacturer's name, logo or trade mark.
- b) Relay type and variant code.
- c) Manufacturer's batch identification code.
- d) IECQ in letters or IECQ mark of conformity.
- e) Detail specification reference if not marked on the relay.
- f) Quantity.

#### 1.5.3 Coded date of manufacture

The marking system shall use four figures as specified in 5.2 of IEC 60062. The first two figures shall be the last two figures of the year and the last two figures the numbering of the week (5.2.3.3 b) of ISO 8601, year and week in the current century, modified).

Example: Fifth week of 1994 = 9405.

If stated in the detail specification only, the basic format for a specific date in accordance with 5.2.1.3 a) of ISO 8601 shall be used. The first two figures shall be the last two figures of the year, the month is represented by the next two figures and the day of the month is represented by the last two figures.

Example: 20th June 1994 = 940620.