

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Electromechanical all-or-nothing relays –
Part 51: Blank detail specification – Electromechanical all-or-nothing telecom
relays of assessed quality – Non-standardized types and construction**

**Relais électromécaniques de tout-ou-rien –
Partie 51: Spécification particulière cadre – Relais électromécaniques de tout-
ou-rien télécom sous assurance de la qualité – Types et construction non
normalisés**



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

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTROMECHANICAL ALL-OR-NOTHING RELAYS –**Part 51: Blank detail specification –****Electromechanical all-or-nothing telecom relays of assessed quality –
Non-standardized types and construction**

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 61811-51 has been prepared by IEC technical committee 94: All-or-nothing electrical relays.

This bilingual version (2014-04) corresponds to the English version, published in 2002-03.

This second edition of IEC 61811-51 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
94/145/FDIS	94/159/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 French version of this standard has not been voted upon.

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.

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WITHDRAWN

ELECTROMECHANICAL ALL-OR-NOTHING RELAYS –

Part 51: Blank detail specification –

Electromechanical all-or-nothing telecom relays of assessed quality –

Non-standardized types and construction

1 General

1.1 Scope

This part of IEC 61811 is a blank detail specification applicable 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 in accordance with IEC 61811-1.

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 60068-1:1988, *Environmental testing – Part 1: General and guidance*
Amendment 1 (1992)

IEC 60068-2-17:1994, *Environmental testing – Part 2: Tests – Test Q: Sealing*

IEC 60068-2-20:1979, *Environmental testing – Part 2: Tests – Test T: Soldering*
Amendment 2 (1987)

IEC 60068-2-47:1999, *Environmental testing – Part 2-47: Test methods – Mounting of components, equipment and other articles for vibration, impact and similar dynamic tests*

IEC 60255-14:1981, *Electrical relays – Part 14: Endurance test for electrical relay contacts – Preferred values for contact loads*

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 61810-7:1997, *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*

IEC 61811-50:2002, *Electromechanical all-or-nothing relays – Part 50: Sectional specification – Electromechanical all-or-nothing telecom relays of assessed quality*

QC 001002-2:1998, *Rules of Procedure for the IEC Quality Assessment System for Electronic Components (IECQ) – Part 2: Documentation*

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

QC 001005:2000, *Register of Firms, Products and Services approved under the IECQ System, including ISO 9000*

(National authorized institutions will complete this clause by making reference to any documents or specifications directly referred to in their national equivalent of this standard.)

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1.3 Front page of the detail specification

The layout of the front page of the detail specification is as follows.

(1)	QC xxxxxx Edition: 200X Page 1 of x	(2)
Electronic components of assessed quality in accordance with:	(3)	(4)
IEC 61810-7:1997 IEC 61811-50:2002		
Detail specification for electromechanical all-or-nothing telecom relays of assessed quality		
Type:		(5)
Construction:		(6)
Outline drawing and wiring diagram	(7)	Application:
Dimensions in millimetres		(8)
Coil data		(9)
Rated voltages:	... V d.c.	
Rated power:	... mW	
Contact data		(10)
Number(s) and type(s) of contacts		
Rated contact voltage:		
Rated contact current:		
Rated contact power:		
Component climatic category according to IEC 60068-1:		(11)
Temperature range – operating ambient temperature:	...°C to ...°C	
– storage temperature:	...°C to ...°C	
Information about manufacturers who have components qualified according to this detail specification is available in the current QC 001005.		

Key to front page:

The numbers between brackets on the front page correspond to the following indications which should be given.

Identification of the detail specification

- (1) The name of the national standards organization under whose authority the detail specification is published and, if applicable, the organization from whom the detail specification is available.
- (2) The IECQ symbol and the number allotted to the completed detail specification by the IECQ secretariat.
- (3) The number and the year of availability of the IEC standard concerning test and measurement procedures for electromechanical all-or-nothing relays and/or sectional specification; also national reference, if different.
- (4) If different from the IECQ number, the national number of the detail specification, date of issue and any further information required by the national system, together with any amendment numbers.

Identification of the relay

- (5) Type: monostable or bistable, non-polarized or polarized, number and types of contacts.
- (6) Construction: sizes, for example dual-in-line, base and overall height, type of relay, based upon environmental protection (RT I to RT IV), mounting variants and other typical construction details.
- (7) An outline drawing with main dimensions which are of importance for interchangeability, and/or reference to the appropriate national or international document for outlines. Alternatively, this drawing may be given in an annex to the detail specification, but (7) should always contain an illustration of the general outer appearance of the component.
- (8) Typical field of applications.
- (9) Available rated coil voltages and rated power.
- (10) Available contact arrangements, defined special contact materials and contact voltage, current and power. The respective code digit for contact materials shall be listed in an annex, if applicable.
- (11) Component climatic category according to clause 8 and annex A of IEC 60068-1, and temperature range.

2 Characteristic values of the relay**2.1 General data**

- Thermal resistance: max. ... K/W
- Contact application: CA 0, CA 1, CA 2 and CA 3
- Relay mass: max. ... g
- Finish of the terminals: presoldering; admissible non-presoldered part, for example max. distance to the relay body, if applicable
- Insulation resistance: ... MΩ min. at 500 V d.c. initial value
- Dielectric strength: see table 1

2.4 Contact data

2.4.1 Electrical endurance and switching frequency

Contact failure: contact-circuit resistance of a closed contact higher than the value stated in 2.4.2, or resistance of an open contact-circuit lower than 100 kΩ, both more than once per 10⁶ cycles or for the minimum number of switching cycles stated (if lower than 10⁶), calculated for each single contact.

Example: at a given endurance of 10⁷ operations, the total number of faults, as described above, shall not exceed 10.

Table 3 – Loads, contact-circuit resistance limits, switching cycles and frequencies for electrical endurance and overload tests

Loads	Contact-circuit resistance Ω max.	Number of switching cycles min.	Switching frequencies cycles per s max.
Contact application 0			
Resistive max. contact voltage/max. power			
Resistive max. contact current/max. power			
DC open-ended cable			
Overload			

2.4.2 Static contact-circuit resistance

100 mΩ max. initial condition at rated voltage.

10 mΩ max. difference of contact-circuit resistance at other coil voltages (e.g. at must operate voltage for make contacts), initial value;

1 Ω max. during/after electrical endurance and environmental tests at rated voltage.

2.4.3 Mechanical endurance

Min. ... switching cycles.

2.4.4 Timing (without suppression device)

- Operate time: max. ...ms
- Release time: max. ...ms
- Bounce time when the contacts are closing: max. ...ms
- Bounce time when the contacts are opening: max. ...ms
- Transfer time on operation and release (last break contact opens before first make contact closes respectively last make contact opens before first break contact closes – each contact monitored) or bridging time on operation and release (last make contact closes before first break contact opens respectively last break contact closes before first make contact opens – each contact monitored): min. ...ms

2.5 Mounting

The relay terminals are designed to be directly soldered onto the printed circuit board using conventional assembling techniques or for surface mounting technology (if applicable).

2.6 Environmental data

The relays shall withstand at least the following environmental stresses:

- shock, functional: ...m/s² (*g*) half-sine acceleration, ...ms duration;
- shock, survival: ...m/s² (*g*) half-sine acceleration, ...ms duration;
- vibration (sinusoidal): ...amplitude mm or ...m/s² (*g*), to ...Hz;
- mechanical robustness of terminals
 - thrust: ...N;
 - bending: ...bends;
- soldering:
 - if particular ageing is required, this shall be selected from procedures 1a, 1b, 2 or 3 of 4.2 of IEC 60068-2-20 and stated in the detail specification;
 - solderability at 235 °C: 2 s;
 - resistance to soldering heat, terminal immersion time at 260 °C: 5 s or 10 s;
- enclosure (if relevant): leak rate: max. 100 Pa · cm³/s;
- resistance to cleaning solvents when rubbed with tissue paper: demineralized or distilled water at 55 °C: 5 min;
- fire hazard, needle flame: min. ...s;
- acoustic noise level (optional requirement shall be stated in detail specification): max. ...dB.

2.7 Package of relays for automatic handling (if applicable)

If stick magazines or tape and reel packaging for automatic handling (to facilitate automatic relay insertion) are used, their outline drawing (profile and length), storage capacity and possible marking shall be given in an annex.

3 Qualification approval procedures

- As stated in 3.1.4 a) of QC 001002-3, fixed sample.
- Sampling and test schedule are specified in table 5.
- The tests specified and their order are mandatory.

4 Quality conformance inspection

Quality conformance inspection contains the tests stated in table 4:

- groups A and B: lot-by-lot tests;
- group C: periodic tests.

Unless otherwise stated in this blank detail specification, all tests of table 4 are mandatory. Where a subgroup contains cumulative tests, the order of the tests is mandatory. Specimens subjected to tests denoted as destructive (D) shall not be released for delivery.

NOTE If a special level of AQL is required, the AQL value regarding subgroups A4, B1 and B2 in table 4 should be provided between the manufacturer and user of a relay.

4.1 Formation of inspection lots

According to 3.2.3 of QC 001002-3, the basis for determination of sample size for the quality conformance inspection is the relay quantity produced during one week.

4.2 Intervals between tests

- Subgroups A4, B1 and B2: minimum once a week.
- Subgroups C1 and C2: at least once a year.
- Subgroups C4 to C6: at least once every two years.

5 Marking and documentation

Relays and their package shall be marked as follows.

5.1 Marking of the relay

The marking shall be durable and easily legible, the following items shall be present:

- 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 of IEC 61811-50;
- d) IECQ in letters or IECQ mark of conformity;
- e) IECQ type designation (ordering information), if not implicit in b), see also 2.2;
- f) identification of terminal No. 1.

NOTE IECQ type designation in item e) may be omitted in an unavoidable case.

5.2 Marking of the package

- a) Manufacturer's name, logo or trade mark.
- b) Relay type and variant code.
- c) Manufacture's batch identification code.
- d) IECQ in letters or IECQ mark of conformity;
- e) IECQ type designation (ordering information), if not implicit in b), see also 2.2;
- f) Detail specification reference if not marked on the relay.
- g) Quantity.

NOTE IECQ type designation in item e) may be omitted in an unavoidable case.

5.3 Documentation

For each delivery, a declaration of conformity according to 2.4 of QC 001002-2 shall be added.