

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Electromechanical all-or-nothing relays –
Part 54: Blank detail specification – Electromechanical all-or-nothing telecom
relays of assessed quality – Two change-over contacts, 15 mm × 7,5 mm base**

**Relais électromécaniques de tout-ou-rien –
Partie 54: Spécification particulière cadre – Relais électromécaniques de tout-
ou-rien télécom sous assurance de la qualité – Deux contacts à deux directions,
surface d'encombrement de 15 mm × 7,5 mm**



THIS PUBLICATION IS COPYRIGHT PROTECTED
Copyright © 2002 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

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

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

IEC Catalogue - webstore.iec.ch/catalogue

The stand-alone application for consulting the entire bibliographical information on IEC International Standards, Technical Specifications, Technical Reports and other documents. Available for PC, Mac OS, Android Tablets and iPad.

IEC publications search - www.iec.ch/searchpub

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and also once a month by email.

Electropedia - www.electropedia.org

The world's leading online dictionary of electronic and electrical terms containing more than 30 000 terms and definitions in English and French, with equivalent terms in 14 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC Glossary - std.iec.ch/glossary

More than 55 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: csc@iec.ch.

A propos de l'IEC

La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications IEC

Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Catalogue IEC - webstore.iec.ch/catalogue

Application autonome pour consulter tous les renseignements bibliographiques sur les Normes internationales, Spécifications techniques, Rapports techniques et autres documents de l'IEC. Disponible pour PC, Mac OS, tablettes Android et iPad.

Recherche de publications IEC - www.iec.ch/searchpub

La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études,...). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

IEC Just Published - webstore.iec.ch/justpublished

Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et aussi une fois par mois par email.

Electropedia - www.electropedia.org

Le premier dictionnaire en ligne de termes électroniques et électriques. Il contient plus de 30 000 termes et définitions en anglais et en français, ainsi que les termes équivalents dans 14 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

Glossaire IEC - std.iec.ch/glossary

Plus de 55 000 entrées terminologiques électrotechniques, en anglais et en français, extraites des articles Termes et Définitions des publications IEC parues depuis 2002. Plus certaines entrées antérieures extraites des publications des CE 37, 77, 86 et CISPR de l'IEC.

Service Clients - webstore.iec.ch/csc

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: csc@iec.ch.

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Electromechanical all-or-nothing relays –
Part 54: Blank detail specification – Electromechanical all-or-nothing telecom
relays of assessed quality – Two change-over contacts, 15 mm × 7,5 mm base**

**Relais électromécaniques de tout-ou-rien –
Partie 54: Spécification particulière cadre – Relais électromécaniques de tout-
ou-rien télécom sous assurance de la qualité – Deux contacts à deux directions,
surface d'encombrement de 15 mm × 7,5 mm**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

PRICE CODE
CODE PRIX



ICS. 29.120.70

ISBN 978-2-8322-1523-4

**Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

CONTENTS

FOREWORD.....	3
1 General	5
1.1 Scope.....	5
1.2 Normative references	5
1.3 Front page of the detail specification.....	7
2 Characteristic values of the relay	8
2.1 General data.....	8
2.2 Construction of IECQ type designation (ordering information).....	9
2.3 Coil data.....	9
2.4 Contact data.....	10
2.4.1 Electrical endurance and switching frequency.....	10
2.4.2 Static contact-circuit resistance.....	10
2.4.3 Mechanical endurance	10
2.4.4 Timing (without suppression device).....	10
2.5 Mounting	11
2.6 Environmental data.....	11
2.7 Package of relays for automatic handling (if applicable).....	11
3 Qualification approval procedures	11
4 Quality conformance inspection	12
4.1 Formation of inspection lots.....	12
4.2 Intervals between tests.....	12
5 Marking and documentation	12
5.1 Marking of the relay.....	12
5.2 Marking of the package.....	12
5.3 Documentation	13
6 Annexes	13
7 Tests	13
7.1 Standard conditions for testing.....	13
7.2 Mounting of test specimens during the test	13
7.3 General conditions for testing	13
8 Ordering information.....	13
9 Relay reliability – Failure rate data (optional).....	13
 Table 1 – Dielectric test voltages.....	 9
Table 2 – Coil data.....	9
Table 3 – Loads, contact-circuit resistance limits, switching cycles and frequencies for electrical endurance and overload tests.....	10
Table 4 – Quality conformance inspection	14-28
Table 5 – Qualification approval	29-31
Table 6 – Industrial qualification	31

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTROMECHANICAL ALL-OR-NOTHING RELAYS –**Part 54: Blank detail specification –
Electromechanical all-or-nothing telecom relays of assessed quality –
Two change-over contacts, 15 mm × 7,5 mm base**

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.
- 2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61811-54 has been prepared by of 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 61811-54 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
94/148/FDIS	94/162/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.

Withdrawn

iTech Standards
(<https://standards.iteh.ai>)
Document Preview

[IEC 61811-54:2002](https://standards.iteh.ai/catalog/standards/iec/286a0086-eeb4-4217-9794-e6113b887336/iec-61811-54-2002)

<https://standards.iteh.ai/catalog/standards/iec/286a0086-eeb4-4217-9794-e6113b887336/iec-61811-54-2002>

ELECTROMECHANICAL ALL-OR-NOTHING RELAYS –

Part 54: Blank detail specification – Electromechanical all-or-nothing telecom relays of assessed quality – Two change-over contacts, 15 mm × 7,5 mm base

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 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 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 of the IEC Quality Assessment System for Electronic Components (IECQ) – Part 2: Documentation*

QC 001002-3:1998, *Rules of Procedure of 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*

CECC 00802:1990, *Guidance document: CECC Standard Method for the Specification of Surface Mounting Components (SMDs) of Assessed Quality*

(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.)



iTech Standards
(<https://standards.itih.ai>)
Document Preview

[IEC 61811-54:2002](https://standards.itih.ai/standards/iec/286a0086-ccb4-4217-9794-e6113b887336/iec-61811-54-2002)

<https://standards.itih.ai/standards/iec/286a0086-ccb4-4217-9794-e6113b887336/iec-61811-54-2002>

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	(3)	(2)	(4)
Electronic components of assessed quality in accordance with: IEC 61810-7:1997 IEC 61811-50:2002		(5)		
Detail specification for electromechanical all-or-nothing telecom relays of assessed quality, dual-in-line, with 15 mm × 7,5 mm base, two change-over contacts				
Type: two change-over contacts				
Construction: dual-in-line, with 15 mm × 7,5 mm base				
plastic sealed case, overall height through-hole type of 11 mm max. surface mounting type of 12 mm max.				
relay properties RT III for conventional assembling techniques of printed circuit boards using mounting holes and soldering or for surface mounting technology (if applicable)				
Outline drawing and wiring diagram Dimensions in millimetres		(7)		
<p>Through hole type</p> <p>Stand-offs</p> <p>Surface mounting type (if applicable)</p> <p>Terminals</p> <p>Wiring diagram, bottom view</p> <p>IEC 639/02</p> <p>NOTE Drawings are examples; the maximum outer dimensions, the wiring diagram of one coil relay, the terminal arrangement and the same orientation of all rectangular terminals are mandatory.</p>		(8)		
Application:				
Relays according to this standard are provided for the operation in telecommunication applications. However, as printed circuit board relays, they are suitable also for control or switching functions in particular industrial and other applications.				
Coil data				
Rated voltages: V d.c.				
Rated power: mW				
Contact data				
Change-over break-before-make contacts				
Rated contact voltage: 110 V d.c. / 125 V a.c.*				
Rated contact current: 1,25 A max.				
Rated contact power: 30 W/50 VA*				
Limiting continuous current: 2 A max. * AC values mandatory only if stated in detail specification.				
Component climatic category according to IEC 60068-1: 25/70/21				
Temperature range				
- operating ambient temperature: -25 °C to 70 °C				
- storage temperature: -40 °C to 85 °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/or CA 3
- Relay mass: max. ... g
- Finish of the terminals: presoldering; admissible non-presoldered part: max. 1 mm to the stand-off plane, if applicable
- Insulation resistance: 1 000 M Ω 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 10⁵ cycles or for the minimum number of switching cycles stated, calculated for each single contact; or a contact fault due to non-opening with a short circuit between break and make contact (resistance value lower than 100 Ω), i.e. one contact fault is permissible for 100 000 switching cycles and seven contact faults are permissible for 700 000 switching cycles.

Example: at a given endurance of 10⁶ 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	1	700 000	12,5
Resistive – max. contact voltage/max. power	1	100 000	3
Resistive – max. contact current/max. power	1	100 000	3
DC open-ended cable	1	1 000 000	12,5
Particular application-related, if required			
Overload	1*	100	0,3

* Unless otherwise stated in the detail specification.

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, mechanical endurance and environmental tests at rated voltage.

2.4.3 Mechanical endurance

10⁷ min. switching cycles.

2.4.4 Timing (without suppression device)

- Operate time: max. 5 ms
- Release time: max. 5 ms
- Bounce time when the contacts are closing: max. 5 ms
- Bounce time when the contacts are opening: max. 3 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): min. 0,1 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: 98,1 m/s² (10 g) half-sine acceleration, 11 ms duration;
- shock, survival: 294,3 m/s² (30 g) half-sine acceleration, 11 ms duration;
- vibration (sinusoidal): amplitude 0,75 mm or 98,1 m/s² (10 g), 10 Hz to 55 Hz;
- mechanical robustness of terminals
 - thrust: 1 N;
 - bending: 2 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;
- through-hole type:
 - solderability at 235 °C: 2 s;
 - resistance to soldering heat, terminal immersion time at 260 °C: 5 s or 10 s;
- surface mounting type:
 - class A1, 6.2 of CECC 00802 (i.e. 260 °C/5 s and 215 °C/40 s);
 - category 3, 6.2 of CECC 00802 (i.e. vapour phase soldering or infrared soldering, if the temperature stress is adequate);
- enclosure leakage 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. 10 s.

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.
- Tests stated in table 6 are mandatory only if stated in the detail specification.

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.