

© Copyright SEK. Reproduction in any form without permission is prohibited.

Elektromekaniska tele-elementarreläer med fastställd kvalitet – Del 1: Artspecifikation och förlaga till detaljspecifikation

*Electromechanical telecom elementary relays of assessed quality –
Part 1: Generic specification and blank detail specification*

Som svensk standard gäller europastandarden EN 61811-1:2015. Den svenska standarden innehåller den officiella engelska språkversionen av EN 61811-1:2015.

Nationellt förord

Europastandarden EN 61811-1:2015

består av:

- **europastandardens ikraftsättningsdokument**, utarbetat inom CENELEC
- **IEC 61811-1, Second edition, 2015 - Electromechanical telecom elementary relays of assessed quality - Part 1: Generic specification and blank detail specification**

utarbetad inom International Electrotechnical Commission, IEC.

Tidigare fastställd svensk standard SS-EN 61811-1, utgåva 1, 1999, SS-EN 61811-10, utgåva 1, 2003, SS-EN 61811-11, utgåva 1, 2003, SS-EN 61811-50, utgåva 1, 2002, SS-EN 61811-51, utgåva 1, 2002, SS-EN 61811-52, utgåva 1, 2002, SS-EN 61811-53, utgåva 1, 2002, SS-EN 61811-54, utgåva 1, 2002 och SS-EN 61811-55, utgåva 1, 2002, gäller ej fr o m 2018-03-04.

Standarder underlättar utvecklingen och höjer elsäkerheten

Det finns många fördelar med att ha gemensamma tekniska regler för bl a mätning, säkerhet och provning och för utförande, skötsel och dokumentation av elprodukter och elanläggningar.

Genom att utforma sådana standarder blir säkerhetsfordringar tydliga och utvecklingskostnaderna rimliga samtidigt som marknadens acceptans för produkten eller tjänsten ökar.

Många standarder inom elområdet beskriver tekniska lösningar och metoder som åstadkommer den elsäkerhet som föreskrivs av svenska myndigheter och av EU.

SEK är Sveriges röst i standardiseringsarbetet inom elområdet

SEK Svensk Elstandard svarar för standardiseringen inom elområdet i Sverige och samordnar svensk medverkan i internationell och europeisk standardisering. SEK är en ideell organisation med frivilligt deltagande från svenska myndigheter, företag och organisationer som vill medverka till och påverka utformningen av tekniska regler inom elektrotekniken.

SEK samordnar svenska intressenters medverkan i SEKs tekniska kommittéer och stödjer svenska experters medverkan i internationella och europeiska projekt.

Stora delar av arbetet sker internationellt

Utformningen av standarder sker i allt väsentligt i internationellt och europeiskt samarbete. SEK är svensk nationalkommitté av International Electrotechnical Commission (IEC) och Comité Européen de Normalisation Electrotechnique (CENELEC).

Standardiseringsarbetet inom SEK är organiserat i referensgrupper bestående av ett antal tekniska kommittéer som speglar hur arbetet inom IEC och CENELEC är organiserat.

Arbetet i de tekniska kommittéerna är öppet för alla svenska organisationer, företag, institutioner, myndigheter och statliga verk. Den årliga avgiften för deltagandet och intäkter från försäljning finansierar SEKs standardiseringsverksamhet och medlemsavgift till IEC och CENELEC.

Var med och påverka!

Den som deltar i SEKs tekniska kommittéarbete har möjlighet att påverka framtida standarder och får tidig tillgång till information och dokumentation om utvecklingen inom sitt teknikområde. Arbetet och kontakterna med kollegor, kunder och konkurrenter kan gynnsamt påverka enskilda företags affärsutveckling och bidrar till deltagarnas egen kompetensutveckling.

Du som vill dra nytta av dessa möjligheter är välkommen att kontakta SEKs kansli för mer information.

SEK Svensk Elstandard

Box 1284
164 29 Kista
Tel 08-444 14 00
www.elstandard.se

English Version

**Electromechanical telecom elementary relays of assessed
quality - Part 1: Generic specification and blank detail
specification
(IEC 61811-1:2015)**

Relais télécom électromécaniques élémentaires soumis au
régime d'assurance qualité - Partie 1: Spécification
générique et spécification particulière cadre
(IEC 61811-1:2015)

Elektromechanische Telekom-Elementarrelais mit
bewerteter Qualität - Teil 1: Fachgrundspezifikation und
Bauartspezifikation
(IEC 61811-1:2015)

This European Standard was approved by CENELEC on 2015-03-04. CENELEC members are bound to comply with the 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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Foreword

The text of document 94/379/FDIS, future edition 2 of IEC 61811-1, prepared by IEC/TC 94 "All-or-nothing electrical relays" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61811-1:2015.

The following dates are fixed:

- latest date by which the document has to be (dop) 2015-12-04
implemented at national level by
publication of an identical national
standard or by endorsement
- latest date by which the national (dow) 2018-03-04
standards conflicting with the
document have to be withdrawn

This document supersedes EN 61811-1:1999, EN 61811-10:2003, EN 61811-11:2003, EN 61811-50:2002, EN 61811-51:2002, EN 61811-52:2002, EN 61811-53:2002, EN 61811-54:2002 and EN 61811-55:2002.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 61811-1:2015 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60068-2-47:2005	NOTE	Harmonized as EN 60068-2-47:2005 (not modified).
IEC 61649	NOTE	Harmonized as EN 61649.
IEC 61709:2011	NOTE	Harmonized as EN 61709:2011 (not modified).
ISO 9001:2008	NOTE	Harmonized as EN ISO 9001:2008 (not modified).

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60062	2004	Marking codes for resistors and capacitors	EN 60062 + corr. January	2005 2007
IEC 60068-1	2013	Environmental testing - Part 1: General and guidance	EN 60068-1	2014
IEC 60068-2-17	1994	Basic environmental testing procedures - Part 2: Tests - Test Q: Sealing	EN 60068-2-17	1994
IEC 60068-2-20	2008	Environmental testing - Part 2-20: Tests - Test T: Test methods for solderability and resistance to soldering heat of devices with leads	EN 60068-2-20	2008
IEC 60068-2-58	2004	Environmental testing - Part 2-58: Tests - Test Td: Test methods for solderability, resistance to dissolution of metallization and to soldering heat of surface mounting devices (SMD)	EN 60068-2-58 + corr. December	2004 2004
IEC 60410	1973	Sampling plans and procedures for inspection by attributes	-	-
IEC 60695-11-5	2004	Fire hazard testing - Part 11-5: Test flames - Needle-flame test method - Apparatus, confirmatory test arrangement and guidance	EN 60695-11-5	2005
IEC 61810	Series	Electromechanical elementary relays	EN 61810	Series
IEC 61810-1	2008 ¹⁾	Electromechanical elementary relays - Part 1: General requirements	EN 61810-1	2008
IEC 61810-2	2011	Electromechanical elementary relays - Part 2: Reliability	EN 61810-2	2011
IEC 61810-7	2006	Electromechanical elementary relays - Part 7: Test and measurement procedures	EN 61810-7	2006
ISO 2859	Series	Sampling procedures for inspection by attributes	-	

¹⁾ Superseded by IEC 61810-1:2015.

CONTENTS

FOREWORD	5
1 Scope	7
2 Normative references	7
3 Terms and definitions	8
3.1 Type of relays	8
3.2 Types of contacts	8
3.3 Contact fault and contact failure	9
3.4 Relay malfunction, relay failure	9
3.5 Relay construction types	9
3.6 Inspection level and sample size	10
4 Rated values	10
4.1 General	10
4.2 Rated coil voltages	10
4.3 Contact-circuit resistance	10
4.4 Dielectric test	10
4.5 Impulse voltage test	10
4.6 Insulation resistance	11
4.7 Number of operations determining electrical endurance	11
4.8 Contact failure rate for test evaluation purposes	11
5 Marking and documentation	11
5.1 General	11
5.2 Marking of the relay	11
5.3 Marking of the package	11
5.4 Coded date of manufacture	11
6 Preparation of blank detail and detail specifications	11
7 Quality assessment procedures	13
7.1 Primary stage of manufacture	13
7.2 Structurally similar relays	13
7.3 Qualification approval procedures	13
7.4 Quality conformance inspection	13
7.4.1 Grouping of tests	13
7.4.2 Resubmission of rejected lots	14
7.4.3 Delivery of relays subjected to destructive tests or non-destructive tests	14
7.4.4 Delayed delivery	14
7.4.5 Supplementary procedure for deliveries	15
7.4.6 Unchecked parameters	15
7.4.7 Release for delivery before completion of group B tests	15
7.4.8 Screening procedures	15
7.4.9 Formation of inspection lots	15
7.4.10 Periodic inspection	15
7.5 Periodic inspection / Intervals between tests	15
8 Test schedule	16
8.1 Test sequence	16
8.2 Types of relays, based upon environmental protection (relay technology (RT))	16
8.3 Categories of application of contacts	16

8.4	Order of tests	16
8.5	Test groups and subgroups	16
9	Tests	21
9.1	Standard conditions for testing	21
9.2	Mounting of test specimens during the test	21
9.3	General conditions for testing	21
10	Ordering information	21
Annex A	(informative) Relay reliability – Failure rate data	22
A.1	General	22
A.2	Scope	22
A.3	Description of the relay	22
A.3.1	Identification	22
A.3.2	Ratings	22
A.4	Fault and failure data	23
A.4.1	Fault and failure definition	23
A.4.2	Fault application	23
A.4.3	Failure definition	23
A.4.4	Failure application	23
A.5	Source of data	23
A.6	Weibull approach	23
A.7	WeiBayes approach	24
A.7.1	Description	24
A.7.2	Method	24
A.7.3	WeiBayes without failures	24
A.7.4	WeiBayes with failures	24
A.7.5	WeiBayes case study	25
Annex B	(informative) Characteristic values of the relay	27
B.1	General data	27
B.2	Coil data	28
B.3	Contact data	28
B.3.1	Electrical endurance and switching frequency	28
B.3.2	Static contact-circuit resistance	28
B.3.3	Mechanical endurance	28
B.3.4	Timing (without suppression device)	29
B.4	Mounting	29
B.5	Environmental data	29
B.6	Package of relays for automatic handling (if applicable)	29
Annex C	(informative) Blank detail and detail specification	30
C.1	Examples for front pages	30
C.1.1	General	30
C.1.2	Type 0 – Non-standardized types and construction	30
C.1.3	Type 1 – Two change-over contacts, 20 mm × 10 mm base	31
C.1.4	Type 2 – Two change-over contacts, 14 mm × 9 mm base	32
C.1.5	Type 3 – Two change-over contacts, 15 mm × 7,5 mm base	33
C.1.6	Type 4 – Two change-over contacts, 11 mm × 7,5 mm (max.) base	34
C.1.7	Key to front page	35
C.2	Qualification approval procedures	35
C.3	Quality conformance inspection	35

C.4 Formation of inspection lots	36
Annex D (informative) Definition of subgroups	53
Bibliography.....	54
Figure A.1 – New compressor design WeiBayes versus old design	26
Table 1 – Group A	17
Table 2 – Group B	18
Table 3 – Group C	19
Table B.1 – Dielectric test voltages	27
Table B.2 – Impulse test voltages	27
Table B.3 – Coil data	28
Table B.4 – Loads, contact-circuit resistance limits, switching cycles and frequencies for electrical endurance and overload tests	28
Table C.1 – Quality conformance inspection	36
Table C.2 – Qualification approval	50
Table C.3 – Industrial qualification	52

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**ELECTROMECHANICAL TELECOM ELEMENTARY
RELAYS OF ASSESSED QUALITY –****Part 1: Generic specification and blank detail specification**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of 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, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). 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. 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 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 IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61811-1 has been prepared by IEC technical committee 94: All-or-nothing electrical relays.

This second edition of IEC 61811-1 cancels and replaces

- IEC 61811-1 published in 1999,
- IEC 61811-10 published in 2002,
- IEC 61811-11 published in 2002,
- IEC 61811-50 published in 2002,
- IEC 61811-51 published in 2002,
- IEC 61811-52 published in 2002,
- IEC 61811-53 published in 2002,
- IEC 61811-54 published in 2002,

- IEC 61811-55 published in 2002,

and constitutes a technical revision. This edition includes the following significant technical changes with respect to the previous editions:

- a) to get one document for telecom relays;
- b) update all relevant references;

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

FDIS	Report on voting
94/379/FDIS	94/383/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.

A list of all parts in the IEC 61811 series, published under the general title *Electromechanical telecom elementary relays of assessed quality*, can be found on the IEC website.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

This publication was drafted in accordance with ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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

ELECTROMECHANICAL TELECOM ELEMENTARY RELAYS OF ASSESSED QUALITY –

Part 1: Generic specification and blank detail specification

1 Scope

This part of IEC 61811 applies to electromechanical telecom elementary relays. Relays according to this standard are provided for the operation in telecommunication applications. However, as electromechanical elementary relays, they are also suitable for particular industrial and other applications.

This standard selects from IEC 61810 series 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 this standard.

Detailed test schedules are contained in the detail specifications.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60062:2004, *Marking codes for resistors and capacitors*

IEC 60068-1:2013, *Environmental testing – Part 1: General and guidance*

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

IEC 60068-2-20:2008, *Environmental testing – Part 2-20: Tests – Test T: Test methods for solderability and resistance to soldering heat of devices with leads*

IEC 60068-2-58:2004, *Environmental testing – Part 2-58: Tests – Test Td: Test methods for solderability, resistance to dissolution of metallization and to soldering heat of surface mounting devices (SMD)*

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

IEC 60695-11-5:2004, *Fire hazard testing – Test flames – Needle-flame test method – Apparatus, confirmatory test arrangement and guidance*

IEC 61810 (all parts), *Electromechanical elementary relays*

IEC 61810-1:2008, *Electromechanical elementary relays – Part 1: General requirements*

IEC 61810-2:2011, *Electromechanical elementary relays – Part 2: Reliability*

IEC 61810-7:2006, *Electromechanical elementary relays – Part 7: Test and measurement procedures*

ISO 2859 (all parts), *Sampling procedures for inspection by attributes*