BRITISH STANDARD

BS EN
61811-11:2003

Electromechanical elementary relays of assessed quality —

Part 11: Blank detail specification — Relays for industrial application

The European Standard EN 61811-11:2003 has the status of a British Standard

ICS 29.120.70

BSI
British Standards

National foreword

This British Standard is the official English language version of EN 61811-11:2003. It is identical with IEC 61811-11:2002. It supersedes BS QC 160101:1987 which will be withdrawn on 2006-02-01.

The UK participation in its preparation was entrusted to Technical Committee EPL/94, General purpose relays and reed contact units, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;

— monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the *BSI Catalogue* under the section entitled "International Standards Correspondence Index", or by using the "Search" facility of the *BSI Electronic Catalogue* or of British Standards Online.

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 16 May 2003

Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 21 and a back cover.

The BSI copyright date displayed in this document indicates when the document was last issued.

Amendments issued since publication

Amd. No.	Date	Comments

ISBN 0 580 41828 6

EUROPEAN STANDARD **EN 61811-11**

NORME EUROPÉENNE

EUROPÄISCHE NORM February 2003

ICS 29.120.70

English version

Electromechanical elementary relays of assessed quality Part 11: Blank detail specification – Relays for industrial application

(IEC 61811-11:2002)

Relais élémentaires électromécaniques soumis au régime d'assurance de la qualité
Partie 11: Spécification particulière cadre - Relais pour applications industrielles
(CEI 61811-11:2002)

Elektromechanische Elementarrelais mit bewerteter Qualität
Teil 11: Vordruck für Bauartspezifikation - Relais für industrielle Anwendungen
(IEC 61811-11:2002)

This European Standard was approved by CENELEC on 2003-02-01. 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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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

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Ref. No. EN 61811-11:2003 E

Foreword

The text of document 94/168/FDIS, future edition 1 of IEC 61811-10, prepared by IEC TC 94, All-or-nothing electrical relays, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61811-10 on 2003-02-01.

The following dates were fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2003-11-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2006-02-01

Annexes designated "normative" are part of the body of the standard.
Annexes designated "informative" are given for information only.
In this standard, annex ZA is normative and annexes A and B are informative.
Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61811-10:2002 was approved by CENELEC as a European Standard without any modification.

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ELECTROMECHANICAL ELEMENTARY RELAYS OF ASSESSED QUALITY –

Part 11: Blank detail specification – Relays for industrial application

1 General

1.1 Scope

This part of IEC 61811 is a blank detail specification applicable to electromechanical elementary (non-specified time all-or-nothing) relays of assessed quality for industrial application.

It is based on the generic specification IEC 61811-1 and the sectional specification IEC 61811-10 and selects from IEC 61810-7 the appropriate test and measurement procedures to be used in detail specifications derived from this specification. Moreover it contains a basic test schedule to be used in the preparation of such specifications.

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

IEC 60068-2-10:1988, *Basic environmental testing procedures – Part 2: Tests – Test J and guidance: mould growth*

IEC 60068-2-21:1999, *Environmental testing – Part 2-21: Tests – Test U: Robustness of terminations and integral mounting devices*

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 60255-23:1996, *Electrical relays – Part 23: Contact performance*

IEC 60695-2-11, *Fire hazard testing – Part 2-11: Glowing/hot-wire based test methods – Glow-wire flammability test method for end-products*

IEC 60695-2-12, *Fire hazard testing – Part 2-12: Glowing/hot-wire based test methods – Glow-wire flammability test method for materials*

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 coordination*

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 61811-10:2002, *Electromechanical elementary relays of assessed quality – Part 10: Sectional specification – Relays for industrial application*

IEC QC 001002, *Rules of procedure for the IEC Quality Assessment System for Electronic Components (IECQ)*

IEC QC 001005, *Register of firms, products and services approved under the IECQ System, including ISO 9000*

1.3 Front page of detail specification

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

<table>
<tr><td>[1]</td><td>QC xxxxx [2]

Edition: .....
Page 1 of .....</td></tr>
<tr><td>Electronic components of assessed quality in accordance with:
IEC 61810-7:1997
IEC 61811-1:1999
IEC 61811-10:2002 [3]</td><td>[4]</td></tr>
<tr><td colspan="2">Detail specification for electromechanical non-specified time all-or-nothing relays for industrial application

Type: [5]

Construction: [6]</td></tr>
<tr><td>Outline drawing [7]

Dimensions in mm</td><td>Application [8]</td></tr>
<tr><td colspan="2">Coil data [9]
- Rated voltage: .....
- Rated power: .....</td></tr>
<tr><td colspan="2">Contact data [10]</td></tr>
<tr><td colspan="2">Temperature range [11]

- Operating temperature: .....
- Storage temperature: .....</td></tr>
<tr><td colspan="2">Information about manufacturers who have components qualified to this detail specification is available in the current QC 001005.</td></tr>
</table>

Key to front page:

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

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 generic and/or sectional specification and the IEC standard concerning test and measurement procedures; 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] A brief description of the relay or range of relays.

[6] Information on typical construction.

[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 by given in an annex to the detail specification, but [7] should always contain an illustration of the general outer appearance of the relay.

[8] Typical field of application and assessment level (if applicable).

[9] Available nominal coil voltages and rated power.

[10] Available contact arrangements and contact current and voltage.

[11] Temperature range and climatic category according to IEC 60068-1 (if applicable).

2 Characteristic values of the relay

These shall be in accordance with IEC 61810-1 as applicable.

2.1 General data

Contact application category: CA ...

Contact arrangement: ...

Mass: ... g max.

Finish of the relay housing: ...

Finish of the terminals: ...

Insulation resistance: ... MΩ min.

Dielectric strength: ... V min.

Table 1 – Dielectric test voltages

	Test voltage V a.c. min.	**Impulse voltage** **... / ... µs** V min.
Open contacts		
Between adjacent contacts		
Contacts to case		
Coil to contacts		
Coil to case		

2.2 Construction of IECQ type designation (ordering information)

Relay IECQ - XXXX A B C Z

Denomination ↑
IECQ detail specification number ↑
Coil voltage (according to Table 2) ↑
Terminals (according to 2.5 and Annex B) ↑
Mounting (according to 2.6 and Annex A) ↑
Special attributes (e.g. suppression diode, additional functions according to 2.3) ↑

The reference to monostable or bistable, polarized or non-polarized, number and kind of contacts and general coil additives shall be given in the title of the specification. Only if one (or more) of these attributes is optional, shall the respective code(s) be given. There shall be no special marks or open space for non applicable criteria.

2.3 Coil data

Table 2 – Coil data

Code letter	**Coil voltage d.c./a.c.**		**Coil resistance and / or impedance**	**Must operate voltage d.c./a.c.**		**Must release voltage d.c./a.c.**				**Must not release voltage d.c./a.c.**	**Rated power/ burden**	**Suppres-sion or special function code or letter** [1]
	V rated	V max.	at 23 °C Ω ± ... %	V_{max} at 23 °C		V_{max} at 23 °C		V_{min} at 23 °C		V_{min} at 23 °C	W/VA	

[1] Configuration of coil suppression or special function, if applicable (details may be given in an annex).

2.4 Contact data

2.4.1 Contact number, contact configuration and application categories

To be given in the detail specification.

2.4.2 Contact load, electrical endurance and switching frequency

Maximum contact voltage: ... V
Minimum contact voltage: ... V
Maximum contact current: ... A
Minimum contact current: ... A

Table 3 – Loads, operating cycles and frequencies for endurance tests

Loads	at V d.c.	at V a.c. / Hz	Number of operating cycles min.	Switching frequencies in cycles per s max.
Resistive				
Low level				

For inductive load the maximum induction relating to the load shall be specified. For relays with contact application category CA 0, the lower values for switching voltage and current shall be specified.

2.4.3 Static contact resistance

... mΩ max. initial resistance

... mΩ max. after electrical endurance test.

(Relays with long leads to be measured at a prescribed distance from the relay body.)

2.4.4 Dynamic contact resistance

... mΩ max. for the respective nominal load (according to 2.4.2).

... mΩ max. for dry circuit switching.

(For relays with long leads the test point shall be specified according to 2.4.3.)

2.4.5 Mechanical endurance

... operating cycles

2.4.6 Timing (over the whole temperature range)

Operate time max. ... ms
Bounce time max. ... ms
Stabilization time max. ... ms
Release time max. ... ms
Release time max. ... ms (with suppression device)

2.5 Terminals

The type of terminals with their respective finish shall be stated together with the identifying code letter.

If the terminals are specified in Annex B of the detail specification, reference shall be made to the annex.

Table 4 – Terminals

Code letter	Terminals	Finish

The robustness of terminals (if specified) shall be indicated according to IEC 60068-2-21, in case of quick-connect terminals according to Annex A of IEC 61810-1.

2.6 Mounting

The mounting variants and the respective code letters shall be specified. Details and drawings shall be included in Annex A of the detail specification.

2.7 Environmental data

The relays shall withstand at least the following environmental stresses:

Shock: ... m/s^2, half sine pulse

Bump: ... m/s^2, ... ms duration

Vibration (sinusoidal): amplitude ... mm or acceleration ... m/s^2, ... Hz to ... Hz

(random): ... g^2/Hz, ... Hz to ... Hz

Climatic category: ...

Further requirements may be indicated in this subclause as applicable, in particular regarding the enclosure (e.g. sealing), or resistance against acoustic noise, mould growth, corrosive atmospheres, etc.

3 Qualification approval procedures

– As stated in clause 3 of QC 001002-3, fixed sample.
– In accordance with the provisions stated in 2.2 of IEC 61811-1 and 4.2 of IEC 61810-1.
– Sampling and test schedule are specified in Table 6.
– The tests specified and their order are mandatory, unless otherwise stated.

4 Quality conformance inspection

Quality conformance inspection contains the tests stated in Table 5:

– Groups A and B: lot-by-lot tests;
– Group C: periodic tests.

Unless otherwise stated (R = recommended test) in this blank detail specification, all tests of Table 5 are mandatory. Where a subgroup contains cumulative tests, the order of the tests is mandatory. Additional tests (e.g. internal moisture, overload, explosion proof, etc.) may be added in the relevant detail specification, as applicable. Samples subjected to tests denoted as destructive (D) shall not be released for delivery.

4.1 Formation of inspection lots

According to 3.3.1 of IEC 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 group C tests

The tests of group C shall be performed in the intervals specified in Table 5.

5 Marking of relay and package

The relay and the package shall be marked with the information given in 5.1 and 5.2 as a minimum.

5.1 Marking of the relay

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

(1) Manufacturer's name, logo or trade mark;
(2) relay type and variants code as defined in 2.2 and in the detail specification;
(3) year and week of manufacture, preferably coded according to IEC 60062;
(4) IECQ mark of conformity;
(5) wiring diagram or identification of terminals (if applicable).

5.2 Marking of package

(1) Manufacturer's name, logo or trade mark;
(2) relay type and variants code as defined in 2.2 and in the detail specification;
(3) year and week of manufacture, preferably coded according to IEC 60062;
(4) IECQ mark of conformity;
(5) quantity;
(6) any further marking as defined in the detail specification.

5.3 Documentation

For each delivery a certificate of conformance according to QC 001002 shall be added.

6 Annexes

Annexes may be added, for example:

Annex A showing mounting variants, their dimensions and corresponding code;
Annex B showing terminal variants, their dimensions and corresponding code;
Annex C showing wiring diagrams;
Annex D showing coil suppression variants and/or special contact configuration and/or special kind of contacts and corresponding codes.

7 Tests

7.1 Standard conditions for testing

Unless otherwise specified all tests shall be performed according to 3.5 of IEC 61810-7.

7.2 Mounting of test items during test

For mechanical dynamic tests (e.g. shock, vibration, acceleration, bump), the relay shall be mounted by its normal mounting methods to the test fixture where inherent resonances have been minimized so as not to invalidate the test (see IEC 60068-2-47).

7.3 General conditions for testing

Unless otherwise stated, the tests shall be carried out under general conditions according to IEC 60068-1.

Unless otherwise stated, the rated energization voltage specified in Table 2 shall be used for all tests.

The polarity of polarized relays shall be observed.

For bistable relays, energizing conditions to be used for testing shall be specified here.

8 Ordering information

See 2.2.

Table 5 – Tests for quality conformance inspection

Group A

To be conducted on a sampling basis, lot-by-lot.

Subgroup A1
For all tests in this subgroup: IL: .....
AQL: .....

Test No.	Test and subclause number according to IEC 61810-7:1997	Conditions of test	Performance requirements
1	Visual inspection (ND) 3.6.4	3.6.4 items a) and b)	Marking shall be present and legible
2	Coil resistance (ND) (for d.c. relays only) 3.8.1		Values as given in Table 2
3	Dielectric test (ND) 3.9	- Application points: selected terminals as specified in 3.9.2 - Test voltage: see Table 1 - Duration of test: 1 s	No breakdown or flashover. Maximum leakage current: ..... A
4	Static contact-circuit resistance (ND) 3.12	- Application points: all closed contacts - Test voltage max.: ..... V - Test current max.: ..... A - Number of readings: 3	Maximum contact resistance: ..... mΩ
5	Functional tests (ND) 3.13	- Order of steps for monostable non-polarized relays: (1) rated value for conditioning (2) zero voltage (3) operate voltage (4) rated voltage (5) non-release voltage (recommended) (6) release voltage - Order of steps for other relay types: analogous (see figures 2 to 5 of IEC 61810-7) - One switching cycle min. - Mounting: as specified - Energization values as given in Table 2	Values according to Table 2
6 (R)	Timing tests (ND) 3.14.2	- Coil voltage: rated voltage - Application points: all contacts - Contact voltage/current: ... V / ... A - Items required in 3.14.2 as applicable	Values according to 2.4.6

Group B

To be conducted on a sampling basis, lot-by-lot.

Subgroup B2 (D)

For all tests in this subgroup: IL: ...
AQL: ...

Test No.	Test and subclause number according to IEC 61810-7:1997	Conditions of test	Performance requirements
7	Visual inspection other than marking (ND) 3.6.4 items c) and d)	Mandatory test for the relay, recommended for accessories and packaging as applicable. Workmanship and finish	Free from external damage or defects
8	Check of dimensions (ND)/(D) 3.6.1	Mandatory for key dimensions, recommended for all other dimensions including clearances and creepage distances	The dimensions shall be within the tolerances specified

Group C

Periodic tests with fixed sample size

Subgroup C1

Periodicity: max. 12 months

Sample size: min. 3 specimens

Test No.	Test and subclause number according to IEC 61810-7:1997	Conditions of test	Sample size and acceptance criterion		Performance requirements
			n	c	
9	Temperature rise of relay parts (ND) 3.18	In accordance with 4.1.6 of IEC 61810-1 – Details of test setup – Temperature: upper limit of the nominal range specified – All make contacts loaded with limiting continuos current – Coil energized at 1,1 times the rated coil voltage – Limits of temperature rise	3	0	After the thermal equilibrium is reached, the prescribed limits of temperature rise shall not be exceeded
10	Dielectric test (ND) 3.9	Same as test no. 3			Same as test No. 3
11	Impulse voltage test (ND) 3.10	In accordance with clause 4 of IEC 61810-5 – Application points: all terminals specified – Waveform: ... / ... µs – Peak value: ... V			No breakdown or flashover, unless otherwise specified
12	Insulation resistance (ND) 3.11	- Application points: selected from 3.11.2 - Test voltage: 500 V d.c. - Duration of test: ... s			... MΩ min.
13 (R)	Enclosure (ND) 3.20	- Sealing (3.20.2): Procedure or sequence of procedures and methods in them, and severity - Sand and dust (3.20.3): Characteristic numeral			As given in 2.7 and in the detail specification

Subgroup C2

Periodicity: max. 12 months

Sample size: min. 4 specimens / 10 contacts

Test No.	Test and subclause number according to IEC 61810-7:1997	Conditions of test	Sample size and acceptance criterion		Performance requirements
			n	c	
14	Electrical endurance (D) 3.30	- Method 1 of 3.30 - Type(s) of load: see 2.4.2 - Contacts tested: as specified - Total number of cycles: see 2.4.2 - Test frequency: see 2.4.2 - Ambient temperature: ...°C - Coil voltage: rated value - Failure criteria: see 4.4 of IEC 60255-23 - Final measurements	min. 4	0	All operating cycles shall be monitored. Permitted number of failures: ... After test all fuses shall be intact.

Subgroup C3

Periodicity: max. 12 months

Sample size: min. ... specimens

Test No.	Test and subclause number according to IEC 61810-7:1997	Conditions of test	Sample size and acceptance criterion		Performance requirements
			n	c	
15	Timing tests (ND) 3.14 (only if not tested in subgroup A1)	Same as test No. 6	3	0	Same as test No. 6
16 (R)	Coil transient suppression (ND) 3.8.4 (for relays with transient suppression device only)	- Rated coil voltage - Limits for back-e.m.f.			The back-e.m.f. shall not exceed the specified limit
17 (R)	Weighing (ND) 3.7.2				The mass shall not exceed the prescribed limits
18	Check of dimensions (ND)/(D) 3.6.1	For all dimensions not tested in subgroup B2			Same as test No. 8

Subgroup C5

Periodicity: max. 2 years

Sample size: min. ... specimens

Test No.	Test and subclause number according to IEC 61810-7:1997	Conditions of test	Sample size and acceptance criterion		Performance requirements
			n	c	
19 (R)	Rapid change of temperature (D) 3.19	- Max. temperature: ... °C - Min. temperature: ... °C - Duration: ... min - Final measurements: as specified	3	0	No signs of deterioration. Resistance values within specified limits.
20	Resistance to soldering heat (D) 3.25 (for relays with solder terminals only)	- Test 2 or test 4 (surface mount terminals) - Methods in either of them: as specified - Number of terminals to be inspected: as specified - Final measurements: as specified	3	0	No signs of deterioration. Tightness of sealed relays maintained. Limits of specified parameters not exceeded.
21 (R)	Climatic sequence (D) 3.15	Dry heat: - Test Ba or Bc - Duration of test: 16 h - Temperature: ...°C - Contact load: ... Cold: - Test Aa or Ab - Duration of test: 2 h - Temperature: ... °C - Contact load: ... Final measurements: as specified	3	0	Presence of functions as specified. No evidence of deterioration. Resistance values within prescribed limits.
22 (R)	Damp heat, steady state (D) 3.16	- Duration: ... days - Recovery time: ... h at room temperature	3	0	No evidence of deterioration. Resistance values within prescribed limits.
23 (R)	Robustness of terminals (D) 3.24	- Applicable test selected from IEC 60068-2-21 - Loads: as specified in 2.5 - Number of terminals to be tested: ... - For quick-connect terminals in accordance with A.4.2 of IEC 61810-1.	3	0	No evidence of deterioration. Resistance values within prescribed limits.
24 (R)	Shock (D) 3.26	- Method 1 or 2 - Pulse shape, acceleration and duration: as 2.7 - Contact load: ... - Energization value : ...	3	0	No opening of closed contact circuits or closing of opened contact circuits shall exceed 10 μs. Contact circuit resistance within prescribed limits.
25 (R)	Bump (D) 3.27	- Method 1 or 2 - Acceleration and number of bumps: as 2.7 - Contact load: ... - Energization value : ...	3	0	No opening of closed contact circuits or closing of opened contact circuits shall exceed 10 μs. Contact circuit resistance within prescribed limits.
26 (R)	Vibration (D) 3.28	- Method 1 or 2 - Frequency range: ... Hz - Acceleration: ... m/s^2 - Spectral density: ... - Duration: ... - Contact load: ... - Energization value : ...	3	0	No opening of closed contact circuits or closing of opened contact circuits shall exceed 10 μs. Contact circuit resistance within prescribed limits.

Test No.	Test and subclause number according to IEC 61810-7:1997	Conditions of test	Sample size and acceptance criterion		Performance requirements
27 (R)	Mechanical endurance (D) 3.31	- Method 1 - Energization value: as Table 2 - Monitoring contact load: ... - Number of cycles/h: ... - Duty factor: ... - Total number of cycles: ... - Allowed number of false contact cycles: ... - In accordance with 4.1.4 of IEC 61810-1	3	0	No evidence of deterioration. Resistance values within prescribed limits.
28 (R)	Thermal endurance (D) 3.32	- Duration: 1000 h - Temperature: ...°C - Energization value: as Table 2	3	0	No evidence of deterioration. Resistance values within prescribed limits.
29	Fire hazard (D) 3.48	Glow-wire test in accordance with 4.1.7 of IEC 61810-1 - Number of specimens: 3 - Temperature: ...°C	3	0	Compliance with the criteria of IEC 60695-2-11 or IEC 60695-2-12.

Subgroup C6

Periodicity: max. 2 years

Sample size: min. ... specimens

Test No.	Test and subclause number according to IEC 61810-7:1997	Conditions of test	Sample size and acceptance criterion		Performance requirements
			n	c	
30 (R)	Resistance to cleaning solvents (ND) 3.47	- Solvent(s) to be used: ... - Solvent temperature: ...°C - Method 1 or 2 - Final measurements: ...	3	0	No visible damage. Marking remains legible.
31 (R)	Electrical contact noise (ND) 3.39 (only if required)	- Energization value(s): ... V - Test circuit - Measurement equipment - Limits of noise voltage: ... V			Noise voltage within specified limits
32 (R)	Mould growth (D) 3.23 (only if required)	- Details as required in IEC 60068-2-10 - Initial/final measurements	3	0	
33 (R)	Corrosive atmospheres (D) 3.22 (only if required)	- Corrosive atmosphere(s): ... - Severities: ... - Recovery conditions: ... - Final measurements: ...	3	0	

Group D

Periodic tests with fixed sample size

Periodicity: max. 2 years

Sample size: min. 3 specimens

Test No.	Test and subclause number according to IEC 61810-7:1997	Conditions of test	Sample size and acceptance criterion		Performance requirements
			n	c	
34 (R)	Coil impedance (ND) (only for a.c. relays) 3.8.3	- Method 1 - Test voltage: rated value - Test frequency: ... Hz	3	0	Coil impedance shall be within the specified limits
35 (R)	Internal moisture (ND) 3.21 (when applicable)	Method 1 or 2			Insulation resistance: ... MΩ min.
36	Solderability (D) 3.25.3 (relays with solder terminals only)	- Test 1 or test 3 (for surface mounting terminals) - Method 1, 2, or 3 of test 1 - Ageing procedure, if required - Number of terminals to be tested: all			There shall be good wetting of the terminals

Glossary:

IL	Inspection Level
AQL	Acceptable Quality Level
n	Sample size
c	Acceptance criterion (permitted number of defectives)
D	Destructive test
ND	Non-destructive test
R	Recommended test

Table 6 – Tests for qualification approval

Sample size: minimum ... samples
Variants of samples: Terminal variants (kind and number): ...
Mounting variants (kind and number): ...
Coil variants (voltage, d.c. or a.c., and number): ...

Test group 0: all samples

Examination or test	Test conditions and requirements (Execution of tests according to Table 5)			Sample size	Number of allowed defectives
	Test conditions according to clause No. of IEC 61810-7:1997	Test No. (see Table 5)	Subgroup (see Table 5)		
Visual inspection	3.6.4	1	A1	all	0
Dielectric test	3.9	3	A1	all	
Static contact resistance	3.12	4	A1	all	
Functional tests	3.13	5	A1	all	
Coil resistance (as applicable)	3.8.1	2	A1	all	
Timing tests (R)	3.14	6	A1	all	

Test Group 1: minimum ... + 1 samples

Rapid change of temperature (R)	3.19	19	C5	3	1
Resistance to soldering heat (if applicable)	3.25.3	20	C5	3	
Shock (R)	3.26	24	C5	3	
Bump (R)	3.27	25	C5	3	
Vibration, random (R)	3.28	26	C5	3	
Visual inspection other than marking	3.6.4	7	B2	3	

Test Group 2: minimium ... + 1 samples

Weighing (R)	3.7.2	17	C3	2	1
Internal moisture (R) (if applicable)	3.21	35	D	2	
Temperature rise of relay parts	3.18	9	C1	2	
Resistance to cleaning solvents (R)	3.47	30	C6	3	
Dimensions	3.6.1	8+18	B2+C3	3	
Solderability (if applicable)	3.25	36	D	3	
Robustness of terminals (R) (as applicable)	3.24	23	C5	2	
Fire hazard	3.48	29	C5	3	

Test Group 3: minimum ... samples

Damp heat, steady state (R)	3.16	22	C5	3	0
Climatic sequence (R)	3.15	21	C5	3	
Mould growth (R) (if required)	3.23	32	C6	3	
Corrosive atmospheres (R) (if required)	3.22.1	33	C6	3	

Test Group 4: minimum ... + 1 samples

Examination or test	Test conditions and requirements (Execution of tests according to Table 5)			Sample size	Number of allowed defectives
	Test conditions according to clause No. of IEC 61810-7:1997	Test No. (see Table 5)	Subgroup (see Table 5)		
Thermal endurance (R)	3.32	28	C5	3	1
Electrical endurance	3.30	14	C2	4	
Mechanical endurance (R)	3.31	27	C5	3	

Test Group 5: minimum ... samples

Electrical contact noise (R) (if required)	3.39	31	C6	3	0
Dielectric test	3.9	10	C1	3	
Impulse voltage test	3.10	11	C1	3	

Test Group 6: minimum ... samples

Timing tests	3.14	6+15	A1+C3	3	0
Insulation resistance	3.11	12	C1	3	
Coil impedance (R) (as applicable)	3.8.3	34	D	3	
Coil transient suppression (R) (if applicable)	3.8.4	16	C3	3	
Enclosure (R)	3.20	13	C1	3	

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

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

Publication	Year	Title	EN/HD	Year
IEC 60062	1992	Marking codes for resistors and capacitors	EN 60062 A11	1993 2001
IEC 60068-1 + corr. October + A1	1988 1988 1992	Environmental testing Part 1: General and guidance	EN 60068-1	1994
IEC 60068-2-10	1988	Part 2: Tests - Test J and guidance: Mould growth	HD 323.2.10 S3	1988
IEC 60068-2-21	1999	Part 2-21: Tests - Test U: Robustness of terminations and integral mounting devices	EN 60068-2-21	1999
IEC 60068-2-47	1999	Part 2-47: Test methods - Mounting of components, equipment and other articles for vibration, impact and similar dynamic tests	EN 60068-2-47 + corr. June	1999 2000
IEC 60255-23	1994	Electrical relays Part 23: Contact performance	EN 60255-23	1996
IEC 60695-2-11	- [1)]	Fire hazard testing Part 2-11: Glowing/hot-wire based test methods - Glow-wire flammability test method for end-products	EN 60695-2-11	2001 [2)]
IEC 60695-2-12	- [1)]	Part 2-12: Glowing/hot-wire based test methods - Glow-wire flammability test method for materials	EN 60695-2-12	2001 [2)]
IEC 61810-1	1998	Electromechanical non-specified time all-or-nothing relays Part 1: General requirements	EN 61810-1	1998

1) Undated reference.

2) Valid edition at date of issue.

Publication	Year	Title	EN/HD	Year
IEC 61810-5	1998	Part 5: Insulation coordination	EN 61810-5	1998
IEC 61810-7	1997	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	EN 61811-1	1999
IEC 61811-10	2002	Part 10: Sectional specification - Relays for industrial application	EN 61811-10	2003
IEC QC 001002	- [1)]	Rules of procedure of the IEC Quality Assessment System for Electronic Components (IECQ)	-	-
IEC QC 001005	- [1)]	Register of firms, products and services approved under the IECQ System, including ISO 9000	-	-

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