

Harmonized system of quality assessment for electronic components —

Generic specification —

Dry and mercury wetted reed contact
units

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- FEI (Federation of the Electronics Industry)
- Ministry of Defence
- National Supervising Inspectorate (BSI PC)

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Contents

	Page
Committees responsible	Inside front cover
National foreword	ii
Foreword	2
Text of EN 119000	5
List of references	Inside back cover

National foreword

This British Standard has been prepared by Technical Committee EPL/94, and is the English language version of EN 119000:1996 *Generic specification: Dry and mercury wetted reed contact units*, published by the Electronic Components Committee (CECC) of the European Committee for Electrotechnical Standardization (CENELEC).

EN 119000 has been prepared by the Technical Committee CENELEC/TC CECC/SC 94 (formerly WG16): Relays, and the United Kingdom participation in the drafting was provided by Technical Committee EPL/94, General purpose relays and the reed contact units.

BS EN 119000:1997 supersedes the following publications which are withdrawn: BS CECC 17000:1984, BS CECC 18000:1984, BS CECC 18001:1984, BS CECC 19000:1979, BS CECC 51000:1986 and BS CECC 52000:1987.

Cross-references

Publication referred to	Corresponding British Standard
CECC 00109:1974	BS CECC 00109:1991 <i>Rule of Procedure 9. Certified test records</i>
EN 60068-1:1994 (IEC 68-1:1988)	BS EN 60068 <i>Environmental testing</i> Part 1:1995 <i>General and guidance</i>
EN 60068-2-1:1993 (IEC 68-2-1:1990)	Part 2 <i>Test methods</i> Section 2.1:1993 <i>Tests A. Cold</i>
EN 60068-2-2:1993 (IEC 68-2-2:1974)	Section 2.2:1993 <i>Tests B. Dry heat</i>
IEC 68-2-3:1969	BS 2011 <i>Environmental testing</i> Part 2.1 Ca:1977 <i>Test Ca. Damp heat, steady state</i> BS EN 60068 <i>Environmental testing</i> Part 2 <i>Test methods</i>
EN 60068-2-6:1995 (IEC 68-2-6:1995)	Section 2.6:1996 <i>Test Fc. Vibration (sinusoidal)</i>
EN 60068-2-7:1993 (IEC 68-2-7:1983)	Section 2.7:1993 <i>Test Ga and guidance. Acceleration, steady state</i>
IEC 68-2-11:1981	BS 2011 <i>Environmental testing</i> Part 2.1 Ka:1982 <i>Test Ka. Salt mist</i>
IEC 68-2-13:1983	Part 2.1 M:1984 <i>Test M. Low air pressure</i>
IEC 68-2-14:1984	Part 2.1 N:1984 <i>Test N. Change of temperature</i> BS EN 60068 <i>Environmental testing</i> Part 2 <i>Tests</i>
EN 60068-2-17:1994 (IEC 68-2-17: 1994)	Section 2.17:1995 <i>Test Q. Sealing</i>
IEC 68-2-20:1979	BS 2011 <i>Environmental testing</i> Part 2.1T:1981 <i>Test T. Soldering</i>
IEC 68-2-21:1983	Part 2.1U:1984 <i>Test U. Robustness of terminations and integral mounting devices</i>

Publication referred to	Corresponding British Standard
	BS EN 60068 <i>Environmental testing</i> Part 2 <i>Tests</i>
EN 60068-2-27:1993 (IEC 68-2-27: 1987)	Section 2.27:1993 <i>Test Ea and guidance. Shock</i>
EN 60068-2-29:1993 (IEC 68-2-29:1987)	Section 2.29:1993 <i>Test Eb and guidance. Bump</i>
	BS 2011 <i>Environmental testing</i> Part 2.1 Db:1981 <i>Test Db and guidance: Damp heat, cyclic (12 + 12 hour cycle)</i>
IEC 617	BS 3939 <i>Graphical symbols for electrical power, telecommunications and electronics diagrams</i>
ISO 1000:1992	BS 5555:1993 <i>Specification for SI units and recommendations for the use of their multiples and of certain other units</i>
CECC 00114-2:1992 has been superseded by CECC 00114-2:1994 which has been published as BS CECC 00114-2:1995.	

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Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, the EN title page, pages 2 to 38, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Descriptors: Dry and mercury wetted contacts units, tests, measurement

English version

Generic Specification: Dry and mercury wetted reed contact units

Spécification générique: Contacts secs et mouillés au mercure, en enceinte scellée

Fachgrundspezifikation: Trockene und quecksilberbenetzte Reedkontakt-Einheiten

This European Standard was approved by CENELEC on 1995-07-04. 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 Central Secretariat or to any CENELEC member.

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CENELEC

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

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Foreword

This European Standard was prepared by the Technical Committee CENELEC TC/CECC SC 94, Relays.

The text of the draft was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 119000 on 1995-07-04.

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) 1996-10-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 1996-10-01

The purpose of this specification was to establish a Generic Specification for several types of reed contact units previously covered by separate Generic Specifications, as already envisaged by the former WG 19 “Reed contact devices” (working group dissolved), see foreword to CECC 52 000 Issue 1.

Consequently, the documents listed below are replaced by this Generic Specification:

- CECC 17 000:1983, Issue 1, Generic Specification: Mercury wetted make contact units
- CECC 18 000:1983, Issue 1, Generic Specification: Dry reed change-over contact units, mechanically biased
- CECC 19 000:1978, Issue 1, Generic Specification: Dry reed make contact units
- CECC 51 000:1985, Issue 1, Generic Specification: Mercury wetted change-over contact units, magnetically biased
- CECC 52 000:1986, Issue 1, Generic Specification: Mercury wetted change-over contact units, mechanically biased

Contents

	Page	Page
1 General	5	3.27 Drain time test 32
1.1 Scope	5	3.28 Voltage surge test 32
1.2 Normative references	5	Annex A Standard test coils for reed contact units 34
1.3 Units, symbols and terminology	5	Annex B Test systems 35
1.4 Preferred values	10	Annex C Example for information sheet on mercury 37
1.5 Marking	11	Figure 1 — Functional characteristics 7
1.6 Subcontracting	11	Figure 2 — Time definitions 8
1.7 Order of precedence	11	Figure 3 — Remanence test sequence 16
1.8 Precautions regarding mercury	11	Figure 4 — Sequence of contact circuit resistance measurement 17
2 Quality Assessment Procedures	12	Figure 5 — Test circuit for the measurement of release and bounce time of a make contact unit 19
2.1 General	12	Figure 6 — Test circuit for the measurement of time parameters of a change-over contact unit 19
2.2 Qualification approval procedures	12	Figure 7 — Electrical endurance test arrangement 26
2.3 Quality conformance inspection requirements	12	Figure 8 — Resistive load combined with cable discharge and/or contact protection 29
3 Test and measurement procedures	13	Figure 9 — Pulse shape for voltage surge test 33
3.1 General	13	Figure A.1 — Configuration of test coils 34
3.2 Alternative procedures	13	Figure B.1 — Test system 1 35
3.3 Standard conditions for testing	13	Figure B.2 — Test system 2 35
3.4 Visual inspection and check of dimensions	13	Table 1 — Resistive loads 28
3.5 Functional tests	14	Table 2 — Loads 29
3.6 Remanence test	15	Table 3 — Cables 29
3.7 Contact circuit resistance	16	Table A.1 — List of standard test coils 34
3.8 Voltage proof	17	
3.9 Insulation resistance	17	
3.10 Operate, release, transfer or bridging, and bounce times	18	
3.11 Contact sticking	20	
3.12 Robustness of terminals	21	
3.13 Soldering	22	
3.14 Climatic sequence	22	
3.15 Damp heat, steady state	23	
3.16 Rapid change of temperature	23	
3.17 Salt mist	23	
3.18 Bump	23	
3.19 Vibration	24	
3.20 Shock	25	
3.21 Acceleration test — Functional test only	25	
3.22 Sealing	26	
3.23 Electrical endurance	26	
3.24 Mechanical endurance	30	
3.25 Maximum cycling frequency	31	
3.26 Mounting position test	32	

1 General

1.1 Scope

This Generic Specification applies to dry and mercury wetted reed contact units of assessed quality. It lists the tests and measurement procedures which may be selected for use in Detail Specifications for such units. This document also specifies the quality assessment procedures to be followed.

This specification applies to those reed contact units which are operated by an applied magnetic field; it is not restricted to any particular type of contact load.

NOTE Since tests using a standard coil and standard resistive loads are the easiest to specify and to define, this specification is currently restricted to tests of this type.

1.2 Normative references

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.

CCITT K. 17:1988, *Blue book, Volume IX: Protection from external interference*.

CECC 00 109:1974, *Rule of Procedure 9: Certified test records*.

CECC 00 114:1992, *Part II: Qualification approval of electronic components*.

IEC 27-1:1992, *Letter symbols to be used in electrical terminology-General*.

IEC 50, *International Electrotechnical Vocabulary (IEV)*.

IEC 68-1:1988, *Basic environmental testing procedures. Part 1: General and guidance*.

IEC 68-1A1:1992, (harmonized as EN 60068-1:1994).

IEC 68-2-1:1990, *Part 2: Tests — Tests A: Cold* (harmonized as EN 60068-2-1:1993).

IEC 68-2-2:1974, *Tests B: Dry heat*.

IEC 68-2-2A:1976, *Supplement* (harmonized as EN 60068-2-2:1993).

IEC 68-2-3:1969, *Test Ca: Damp heat, steady state*.

IEC 68-2-3A1:1984, (harmonized as HD 323.2.3 S2:1987).

IEC 68-2-6:1995, *Test Fc: Vibration (sinusoidal)* (harmonized as EN 60068-2-6:1995).

IEC 68-2-7:1993, *Test Ga: Acceleration, steady state*.

IEC 68-2-7A1:1986, (harmonized as EN 60068-2-7:1993).

IEC 68-2-11:1981, *Test Ka: Salt mist* (harmonized as HD 323.2.11 S1:1988).

IEC 68-2-13:1983, *Test M: Low air pressure* (harmonized as HD 323.2.13 S 1:1987).

IEC 68-2-14:1984, *Test N: Change of temperature*.

IEC 68-2-14A1:1986, (harmonized as HD 323.2.14 S2:1987).

IEC 68-2-17:1994, *Test Q: Sealing* (harmonized as EN 60068-2-17:1994).

IEC 68-2-20:1979, *Test T: Soldering*.

IEC 68-2-20A1:1986,

IEC 68-2-20A2:1987, (harmonized as HD 323.2.20 S3:1988).

IEC 68-2-21:1983, *Test U: Robustness of terminations and integral mounting devices*.

IEC 68-2-21A2:1991, (harmonized as HD 323.2.21 S3:1988).

IEC 68-2-21A3:1992,

IEC 68-2-27:1987, *Test Ea: Shock* (harmonized as EN 60068-2-27:1993).

IEC 68-2-29:1987, *Test Eb: Bump* (harmonized as HD EN 60068-2-29:1993).

IEC 68-2-30:1980, *Test Db: Damp heat, cyclic*.

IEC 68-2-30A1:1985, (harmonized as HD 323.2.30 S3:1988).

IEC 96: series, *Radio-frequency cables*.

IEC 317-1:1990, *Specifications for particular types of winding wires -- Part 1: Polyvinyl acetal enamelled round copper wire, class 105* (harmonized as EN 60317-1:1994).

IEC 410:1973, *Sampling plans and procedures for inspection by attributes*.

IEC 617: series, *Graphical symbols for diagrams*.

ISO 1000:1973, *SI units and recommendation for the use of their multiples and of certain other units*.

1.3 Units, symbols and terminology

Units, graphical symbols, letter symbols and terminology shall, whenever possible, be taken from the following documents:

ISO 1000, SI units and recommendations for the use of their multiples and of certain other units.

IEC 27, Letter symbols to be used in electrical technology.

IEC 50, International electrotechnical vocabulary.

IEC 617, Graphical symbols for diagrams.

Any other units, symbols and terminology peculiar to one of the components covered by the Generic Specification, shall be taken from the relevant IEC or ISO documents, listed under 1.2, Normative references.

The following paragraphs contain additional terminology applicable to reed contact units.

1.3.1 reed contact unit

Assembly containing contact blades, some or all of magnetic material, hermetically sealed in an envelope and controlled by means of externally generated magnetic field (e.g. an energizing quantity applied to a coil).

1.3.2 mercury wetted contact unit

Assembly containing contact blades, some or all of magnetic material, some or all mercury wetted, hermetically sealed in an envelope and controlled by means of externally generated magnetic field (e.g. an energizing quantity applied to a coil).

1.3.3 contact blade

Metal blade providing either the functions of electric or magnetic circuit or both functions combined as in the case of dry and wetted reed contacts units.

For mercury wetted contact units: Metal blade providing either the functions of electric circuit through mercury or the magnetic circuit, or both functions combined.

1.3.4 biasing magnetic field

Continuous magnetic field intended to determine the operate and the release position of the contact, which can be adjusted to form a monostable or bistable contact unit.

NOTE For bistable contact units, operate and release conditions have to be defined by the manufacturer in the Detail Specification with reference to applied magnetic field polarity.

1.3.5 applied magnetic field

Externally generated field (for example by a test coil) intended to change the position of the contact.

1.3.6 contact unit, mechanically biased

A contact unit where the biasing, to determine the operate and release positions, is achieved mechanically.

1.3.7 magnetically biased contact unit

Contact unit to which a biasing magnetic field is applied, determining the functional characteristics and the operate and release position.

1.3.8 make contact (Form A contact)

A make contact of a reed contact unit is open when there is no applied magnetic field. This is a normally open contact.

1.3.9 break contact (Form B contact)

A break contact of a reed contact unit is closed when there is no applied magnetic field. This is a normally closed contact.

1.3.10 change-over reed contact unit

A change-over reed contact unit contains a make contact and a break contact within its envelope, one contact blade being common.

1) change-over break-before-make reed contact unit (Form C contact)

Change-over reed contact unit, one contact circuit of which breaks before the other makes.

2) change-over make-before-break reed contact unit (Form D contact)

Change-over reed contact unit, one contact circuit of which makes before the other breaks.

3) change-over reed contact unit with unspecified switching sequence (Form A + B contact)

Change-over reed contact unit where the switching sequence can be either make-before-break or break-before-make.

1.3.11 type

A type comprises products having similar design features manufactured by the same techniques and falling within the manufacturer's usual range of ratings for these products

NOTE Mounting accessories are ignored, provided they have no significant effect on the test results.

1.3.12 variant

A variation within a type having specific nominal dimensions and characteristics.

1.3.13 rated value

The value assigned by the manufacturer to a given characteristic of the reed contact unit.

1.3.14 operate position

Position where the make contact is closed and the break contact is open.

1.3.15 release position

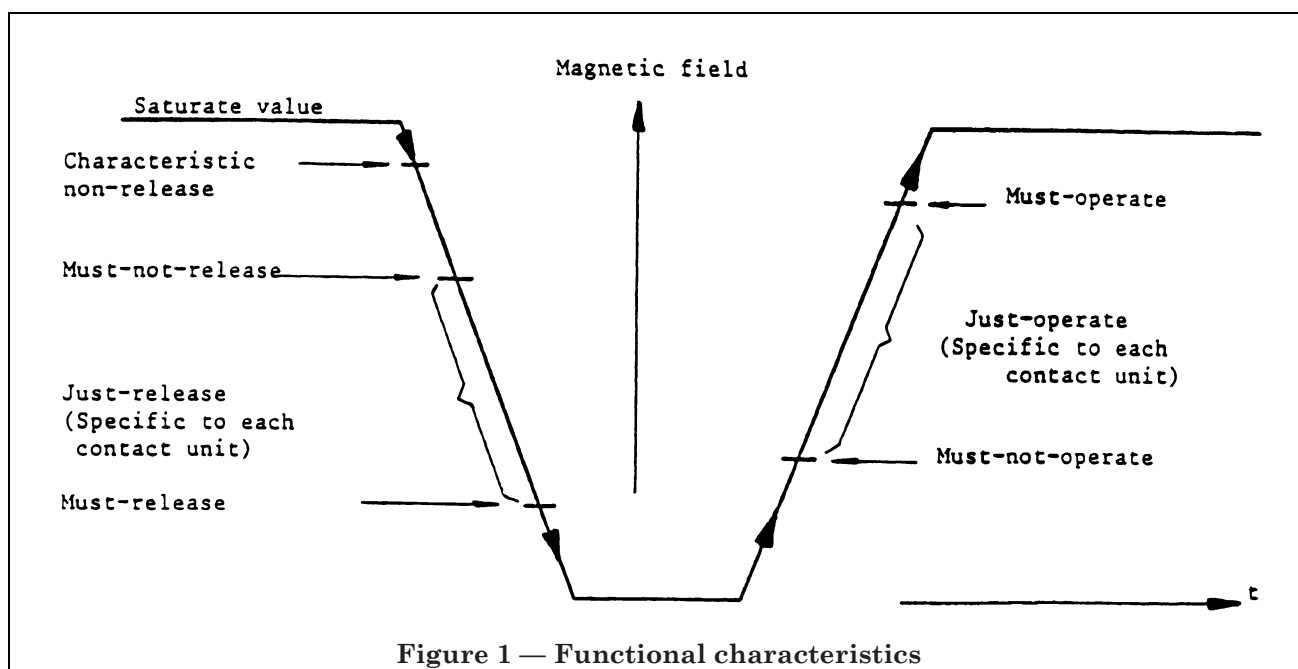
Position where the make contact is open and the break contact is closed.

1.3.16 to operate

A reed contact unit operates when it changes from the release position to the operate position.

1.3.17 to release

A reed contact unit releases when it changes from the operate position to the release position.



1.3.18 just-operate value

The value of the magnetic field at which the released reed contact unit just operates (see Figure 1).

1.3.19 must-operate value

The stated limit of the applied magnetic field at which the reed contact unit operates (see Figure 1).

1.3.20 just-release value

The value of the applied magnetic field at which the operated reed contact unit just releases (see Figure 1).

1.3.21 must-release value

The stated limit of the applied magnetic field at which the operated reed contact unit releases (see Figure 1).

1.3.22 must-not-operate value

The stated limit of the applied magnetic field at which the reed contact unit does not operate (see Figure 1).

1.3.23 must-not-release value

The stated limit of the applied magnetic field at which the operated reed contact unit remains operated (see Figure 1).

1.3.24 characteristic non-release value

The stated value of the applied magnetic field above which the operated reed contact unit fulfils specified qualities, e.g. contact resistance, noise characteristics etc. (see Figure 1).

1.3.25 saturate value

The arbitrarily defined value of the applied magnetic field at which the reed contact unit is unaffected by further increase of the applied magnetic field (see Figure 1).

1.3.26 bounce

A momentary re-opening of a contact after initial closing, or a momentary closing after initial opening.

1.3.27 magnetic dwell (only for change-over contact units)

Difference in the values of applied magnetic field when the break contact just opens and the make contact just closes, or vice versa.

NOTE For time definitions see Figure 2, for test conditions see 3.10.

1.3.28 bounce time

The interval of time between the instant of the first closing (or opening) and the instant of the final closing (or opening) of the reed contact unit.

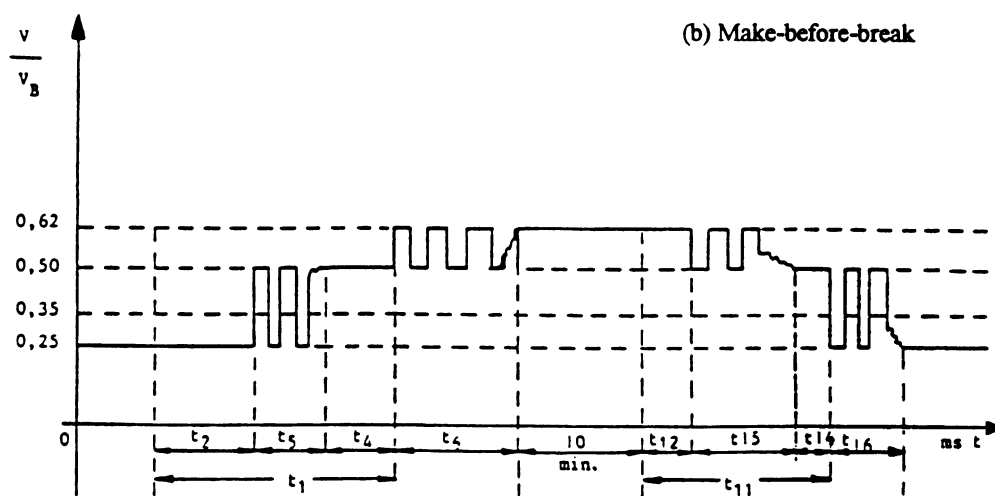
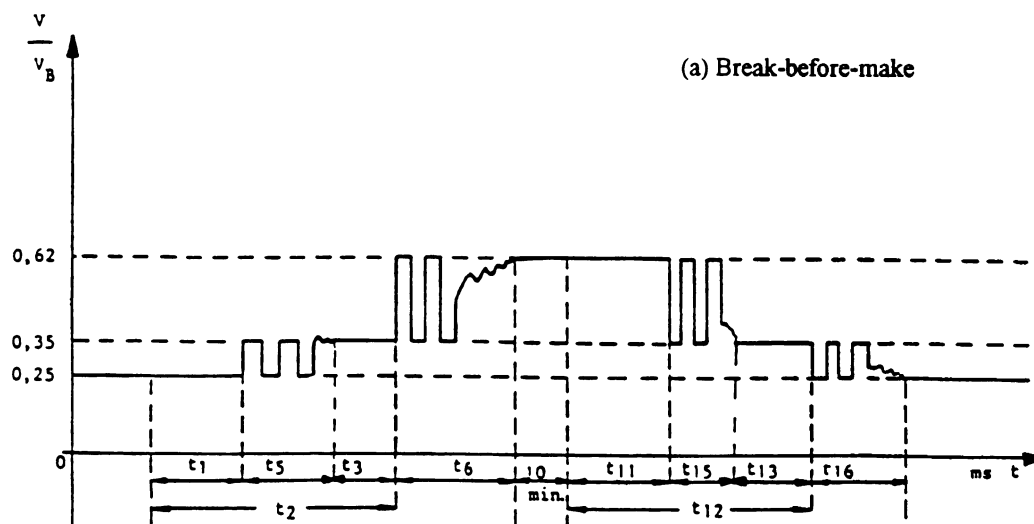
1.3.29 operate time

The time between the instant of the application of a magnetic field to a reed contact unit and the instant the contact is in the operate position. The operate time does not include bounce time.

1.3.30 release time

The time between the instant of the removal of the applied magnetic field to a reed contact unit, and the instant the contact is in the release position. The release time does not include bounce time.

Oscilloscope diagram



Energization of the test coil

t_1 : operate break time
 t_2 : operate make time
 t_3 : operate transfer time
 t_4 : operate bridging time
 t_5 and t_6 : bounce times

De-energization of the test coil

t_{11} : release break time
 t_{12} : release make time
 t_{13} : release transfer time
 t_{14} : release bridging time
 t_{15} and t_{16} : bounce times

Figure 2 — Time definitions