INTERNATIONAL STANDARD

IEC 62246-1

First edition
2002-04

Reed contact units –

Part 1:
Generic specification

Contacts à lames souples en enceinte scellée –

Partie 1:
Spécification générique

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

REED CONTACT UNITS –

Part 1: Generic specification

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.
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International Standard IEC 62246-1 has been prepared by IEC technical committee 94: All-or-nothing electrical relays.

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

FDIS	Report on voting
94/156/FDIS	94/164/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.

This standard cancels and replaces IEC 60255-9 (1979).

The detail specifications (DS), the sectional specifications (SS) and the blank detail specifications (BDS) are not yet available and will be developed as the need arises.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until 2005. At this date, the publication will be

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- withdrawn;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

REED CONTACT UNITS –

Part 1: Generic specification

1 General

1.1 Scope

This part of IEC 62246 which is the 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 standard also specifies the quality assessment procedures to be followed.

This standard 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 1 Since tests using a standard coil and standard resistive loads are the easiest to specify and to define, this standard is currently restricted to tests of this type.

NOTE 2 For elementary relays with reed contact units, this standard is recommended to be used together with the standards IEC 61810-1 and IEC 61811-1 as applicable.

Where in this part of IEC 62246 the term "detail specification" is used, this either has the meaning defined in A.7 of QC 001001 for application within the IECQ system, or it means any appropriate document, for example manufacturer's data sheet, test specification, customer detail specification.

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 60027, *Letter symbols to be used in electrical terminology*

IEC 60050, *International Electrotechnical Vocabulary (IEV)*

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

IEC 60068-2-1:1990, *Environmental testing – Part 2: Tests – Tests A: Cold*
Amendment 1(1993)
Amendment 2(1994)

IEC 60068-2-2:1974, *Environmental testing – Part 2: Tests – Tests B: Dry heat*
Amendment 1(1993)
Amendment 2(1994)

IEC 60068-2-3:1969, *Environmental testing – Part 2: Tests – Test Ca: Damp heat, steady state*

IEC 60068-2-6:1995, *Environmental testing – Part 2: Tests – Test Fc: Vibration (sinusoidal)*

IEC 60068-2-7:1983, *Environmental testing – Part 2: Tests – Test Ga: Acceleration, steady state*
Amendment 1(1986)

IEC 60068-2-11:1981, *Environmental testing – Part 2: Tests – Test Ka: Salt mist*

IEC 60068-2-13:1983, *Environmental testing – Part 2: Tests – Test M: Low air pressure*

IEC 60068-2-14:1984, *Environmental testing – Part 2: Tests – Test N: Change of temperature*
Amendment 1(1986)

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

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

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

IEC 60068-2-27:1987, *Environmental testing – Part 2: Tests – Test Ea and guidance: Shock*

IEC 60068-2-29:1987, *Environmental testing – Part 2: Tests – Test Eb and guidance: Bump*

IEC 60068-2-30:1980, *Environmental testing – Part 2: Tests – Test Db and guidance: Damp heat, cyclic (12 + 12 hour cycle)*
Amendment 1(1985)

IEC 60096 (series), *Radio-frequency cables*

IEC 60317-1:1990, *Specifications for particular types of winding wires – Part 1: Polyvinyl acetal enamelled round copper wire, class 105*
Amendment 1(1997)
Amendment 2(1997)

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

IEC 60617, *Graphical symbols for diagrams*

IEC 61810-1:1998, *Electromechanical non-specified time all-or-nothing relays – Part 1: General requirements*

IEC 61811-1:1999, *Electromechanical non-specified time all-or-nothing relays of assessed quality – Part 1: Generic specification*

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

ITU-T Recommendation K.17:1988, *Tests on power-fed repeaters using solid-state devices in order to check the arrangements for protection from external interference*

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

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 60027, *Letter symbols to be used in electrical technology*

IEC 60050, *International electrotechnical vocabulary*

IEC 60617, *Graphical symbols for diagrams*

Any other units, symbols and terminology specific to one of the components covered by the generic specification, shall be taken from the relevant IEC or ISO documents, listed under 1.2.

The following additional terminology is also applicable.

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 an 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 the electric or magnetic circuit or both functions combined as in the case of dry and wetted reed contact units.

For mercury wetted contact units: metal blade providing either the functions of the 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
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)
means that 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)
means that 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
contains a make contact and a break contact within its envelope, one contact blade being common

a) 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.

b) 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.

c) change-over reed contact unit with unspecified switching sequence (Form A and Form B contacts)

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

1.3.11
type
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
variation within a type having specific nominal dimensions and characteristics

1.3.13
rated value
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
reed contact unit operates when it changes from the release position to the operate position

1.3.17
to release
reed contact unit releases when it changes from the operate position to the release position

1.3.18
just-operate value
value of the magnetic field at which the released reed contact unit just operates (see figure 1)

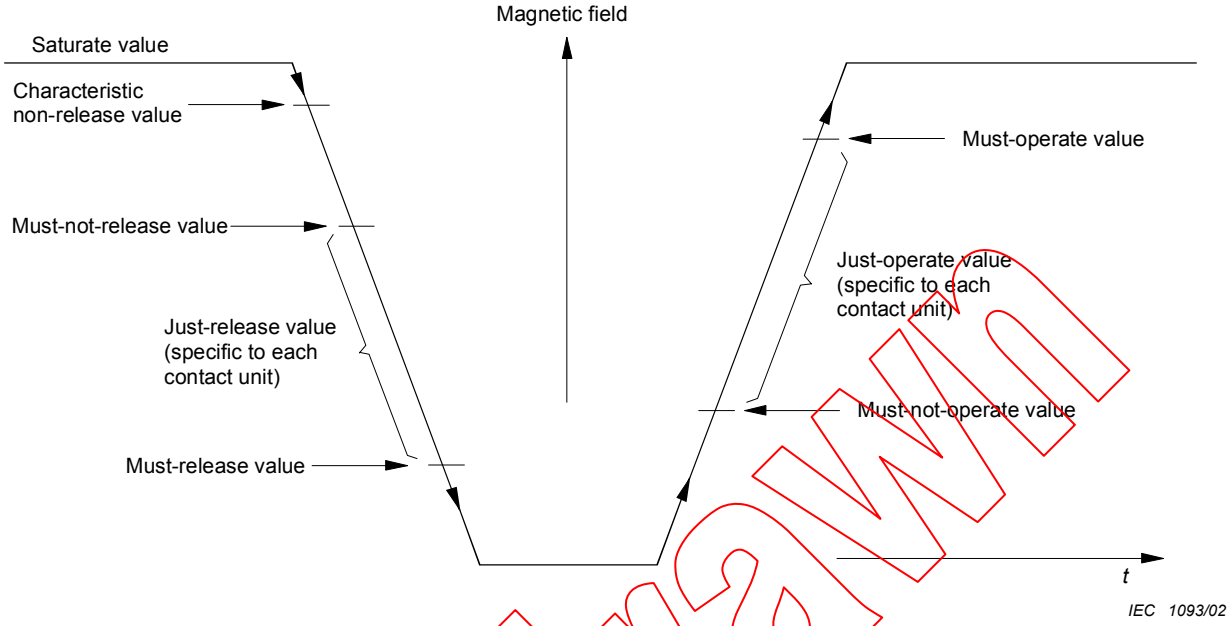


Figure 1 – Functional characteristics

1.3.19
must-operate value
stated limit of the applied magnetic field at which the reed contact unit operates (see figure 1)

1.3.20
just-release value
value of the applied magnetic field at which the operated reed contact unit just releases (see figure 1)

1.3.21
must-release value
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
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
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
stated value of the applied magnetic field above which the operated reed contact unit fulfils specified qualities, for example contact resistance, noise characteristics, etc. (see figure 1)

1.3.25
saturate value
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
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

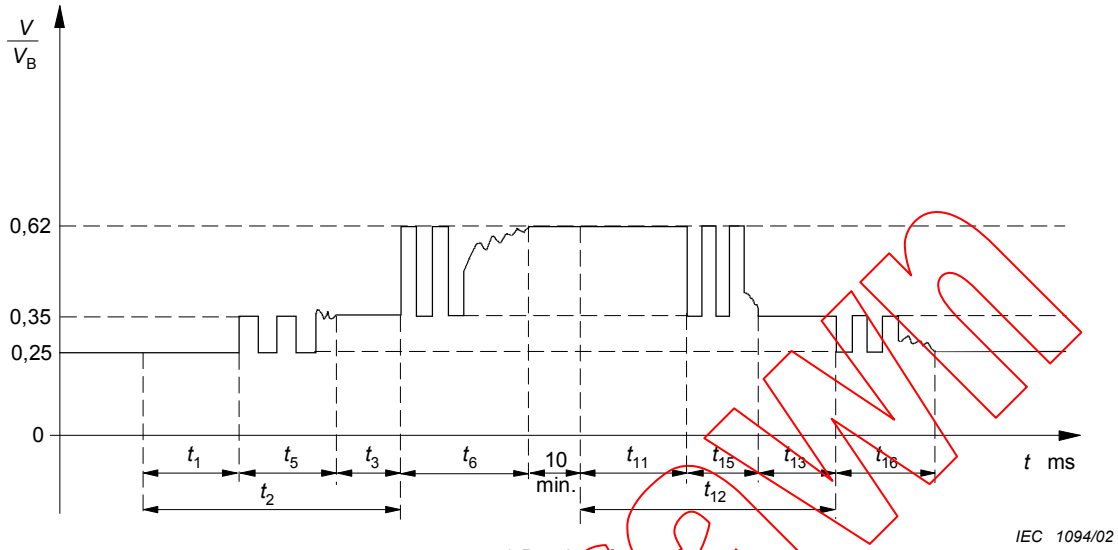
NOTE For time definitions, see figure 2, for test conditions, see 3.10.

1.3.28
bounce time
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

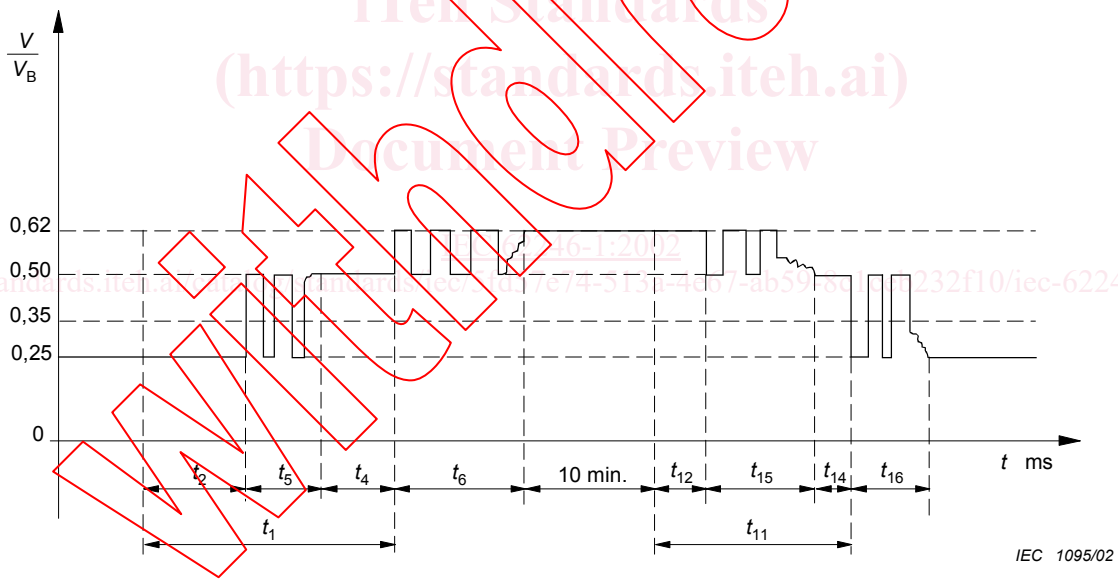
1.3.29
operate time
time between the instant of the application of a magnetic field to a reed contact unit and the instant the contact is in the operate position. It does not include bounce time

1.3.30
release time
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. It does not include bounce time

Oscilloscope diagram



a) Break-before-make



b) Make-before-break

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

Refer to figures 5 and 6 for key to V_B.

Figure 2 – Time definitions

1.3.31
transfer time (Form C contact)
time interval during which both contact circuits are open (not including bounce time)

1.3.32
bridging time (Form D contact)
time interval during which both contact circuits are closed (not including bounce time)

1.3.33
operate make time
time interval between the instant of the application of a magnetic field to the contact unit and the instant of the first closing of the make contact

1.3.34
operate break time
time interval between the instant of the application of a magnetic field to the contact unit and the instant of the first opening of the break contact

1.3.35
release make time
time interval between the instant of the removal of an applied magnetic field from the reed contact unit and the instant of the first closing of the break contact

1.3.36
release break time
time interval between the instant of the removal of an applied magnetic field from the reed contact unit and the instant of the first opening of the make contact

1.3.37
operate transfer time (Form C contact)
transfer time measured when the break-before-make reed contact unit moves from the release position to the operate position

1.3.38
release transfer time (Form C contact)
transfer time measured when the break-before-make reed contact unit moves from the operate position to the release position

1.3.39
operate bridging time (Form D contact)
bridging time during which the make-before-break reed contact unit moves from the release to the operate position

1.3.40
release bridging time (Form D contact)
bridging time during which the make-before-break reed contact unit moves from the operate to the release position

1.3.41
minimum time of operate energization
minimum time between the instant of the first application of a magnetic field (at a stated value), and the instant of reduction of that field to the characteristic non release value to ensure that the reed contact unit is maintained in the operate condition