

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Reed switches –
Part 1: Generic specification**

**Contacts à lames souples –
Partie 1: Spécification générique**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

REED SWITCHES –

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

This standard cancels and replaces the first edition of IEC 62246-1 published in 2002 and the first edition of IEC 62246-2 published in 2007. It constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous editions:

- update of references, terms and definitions;
- renumbering of clauses to bring them into a more logical order;
- inclusion of the generic specifications for all types of reed switches, but mercury wetted reed switches have been removed from the scope due to their potential for environmental impact;
- inclusion of three fundamental conformity assessment procedures for quality assessment;

- improvement of electrical endurance tests covering resistive, inductive, capacitive and filament lamp contact loads;
- renumbering of all annexes in the order they are referenced in the body of the standard;
- improvement of test procedures;
- inclusion of a new Annex C (informative) for electrical endurance test circuit, an Annex D (informative) for inrush current loads, an Annex E (informative) for conditional short-circuit current test circuit, an Annex F (informative) for electrical ratings based on classification, an Annex G (informative) for example of test arrangement for contact reliability test, an Annex H (informative) for example of test arrangement for making current capacity test and an Annex I (informative) for example of test arrangement for breaking current capacity test.

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

FDIS	Report on voting
94/314/FDIS	94/323/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 publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The detail specifications (DS), the sectional specifications (SS) and the blank detail specifications (BDS) deriving from this document are not yet available and the IEC/PAS 62246-2-1 (a quality assessment specification) is intended to be developed to become a full IEC standard.

A list of all parts of the IEC 62246 series can be found, under the general title *Reed switches*, 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.

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

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

REED SWITCHES –

Part 1: Generic specification

1 Scope

This part of IEC 62246 series, which is a generic specification applies to all types of reed switches including magnetically biased reed switches of assessed quality for use in general and industrial applications.

NOTE 1 Mercury wetted reed switches are not covered by this standard due to their possible environmental impact.

It lists the tests and measurement procedures which may be selected for use in detail specifications for such reed switches. This standard also specifies the quality assessment procedures to be followed.

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

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

NOTE 3 The applications of reed switches can be covered by specific product standards and the use of the IEC 62246 series does not guarantee compliance with those standards.

NOTE 4 Where any discrepancies occur for any reasons, documents rank in the following order of authority:

- a) the detail specification,
- b) the sectional specification,
- c) the generic specification,
- d) any other international documents (for example, of the IEC) to which reference is made.

The same order of precedence applies to equivalent national documents.

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*

IEC 60068-2-1:2007, *Environmental testing – Part 2-1: Tests – Test A: Cold*

IEC 60068-2-2:2007, *Environmental testing – Part 2-2: Tests – Test B: Dry heat*

IEC 60068-2-6:2007, *Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)*

IEC 60068-2-7:1983, *Basic environmental testing procedures – Part 2-7: Tests – Test Ga and guidance: Acceleration, steady state*

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

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

IEC 60068-2-14:2009, *Environmental testing – Part 2-14: Tests – Test N: Change of temperature*

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 60068-2-21:2006, *Environmental testing – Part 2-21: Tests – Test U: Robustness of terminations and integral mounting devices*

IEC 60068-2-27:2008, *Environmental testing – Part 2-27: Tests – Test Ea and guidance: Shock*

IEC 60068-2-30:2005, *Environmental testing – Part 2-30: Tests – Test Db: Damp heat, cyclic (12 + 12 h cycle)*

IEC 60068-2-78, *Environmental testing – Part 2-78: Tests – Test Cab: Damp heat, steady state*

IEC 60096 (all parts), *Radio frequency cables*

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

IEC 60947-5-1:2003, *Low-voltage switchgear and controlgear – Part 5-1: Control circuit devices and switching elements – Electromechanical control circuit devices*

IECQ 001002-1:1998, *IEC Quality Assessment System for Electronic Components (IECQ System) – Rules of Procedure – Part 1: Administration*

IECQ 001002-3:2005, *IEC Quality Assessment System for Electronic Components (IECQ System) – Rules of Procedure – Part 3: Approval procedures*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

NOTE Definitions of terms not stipulated in this standard are given in the IEC 60050 series, in particular in the IEC 60050-444.

3.1 Terms and definitions of reed switch types

3.1.1

type

products having similar design features and nominal dimensions manufactured by the same techniques and falling within a range of ratings specified by the manufacturer

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

3.1.2**variant**

variation within a type having specific characteristics

3.1.3**reed switch**

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

3.1.4**high voltage vacuum reed switch**

reed switch, in which ability to switch high voltages is achieved by a high vacuum within the hermetically sealed envelope

3.1.5**heavy-duty reed switch**

reed switch, in which greater switching capacity is achieved

NOTE Blades having additional contact tips or a contact tip and spring which separate the magnetic path and electric path are typical examples of techniques to increase switching capacity.

3.1.6**magnetically biased reed switch**

reed switch to which a biasing magnetic field is applied, determining the functional characteristics and the operate and release position

3.2 Terms and definitions of operating values**3.2.1****preferred position**

position recommended for use and in which tests are normally performed, unless otherwise specified

3.2.2**rated value**

value of a quantity used for specification purpose, established for a specific set of operating conditions

3.2.3**operate position**

position in which the make contact is closed and the break contact is open

3.2.4**release position**

position in which the make contact is open and the break contact is closed

3.2.5**just-operate value**

value of the magnetic and electromagnetic fields at which the released reed switch just operates (see Figure 1)

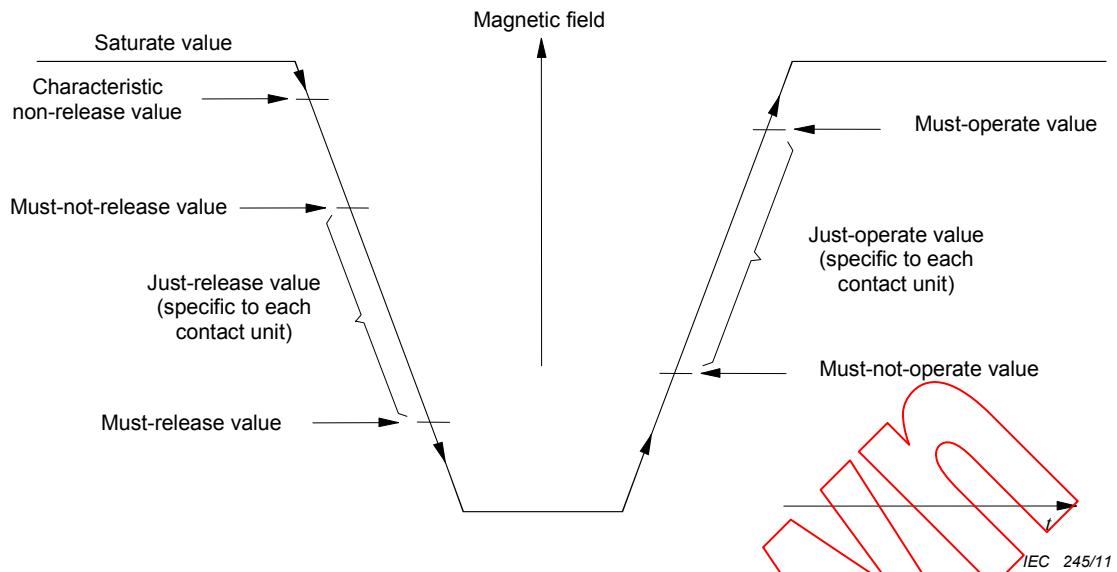


Figure 1 – Functional characteristics

3.2.6

must-operate value

stated limit of the applied magnetic field at which the reed switch operates (see Figure 1)

3.2.7

just-release value

value of the applied magnetic field at which the operated reed switch just releases (see Figure 1)

3.2.8

must-release value

stated limit of the applied magnetic field at which the operated reed switch releases (see Figure 1)

3.2.9

must-not-operate value

stated limit of the applied magnetic field at which the reed switch does not operate (see Figure 1)

3.2.10

must-not-release value

stated limit of the applied magnetic field at which the operated reed switch remains operated (see Figure 1)

3.2.11

characteristic non-release value

stated value of the applied magnetic field above which the operated reed switch fulfils specified qualities, for example contact resistance, noise characteristics, etc. (see Figure 1)

3.2.12

saturate value

value of the applied magnetic field at which the reed switch is unaffected by further increase of the applied magnetic field (see Figure 1)

3.2.13**contact bounce**

phenomenon which can occur while a contact circuit is making or breaking and which is characterized by the contact points successively touching and separating before reaching their final position

3.2.14**magnetic dwell** (only for change-over switches)

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

3.3 Terms and definitions related to operating times (see Figure 2)**3.3.1****bounce time**

for a contact which is closing/opening its circuit, time interval between the instant when the contact circuit first closes/opens and the instant when the circuit is finally closed/opened

3.3.2**operate time**

time interval between the application of the specified magnetic field to a reed switch in the release condition and the change of state of the last output circuit (not including bounce time)

3.3.3**release time**

time interval between the removal of the specified magnetic field to a reed switch in the operate condition, and the change of state of the last output circuit (not including bounce time)