SLOVENSKI STANDARD

SIST EN 60947-5-4:2004

junij 2004

Low-voltage switchgear and controlgear - Part 5-4: Control circuit devices and switching elements - Method of assessing the performance of low-energy contacts - Special tests

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EUROPEAN STANDARD **EN 60947-5-4**

NORME EUROPÉENNE

EUROPÄISCHE NORM December 2003

ICS 29.130.20 Supersedes EN 60947-5-4:1997

English version

Low-voltage switchgear and controlgear
Part 5-4: Control circuit devices and switching elements - Method of assessing the performance of low-energy contacts - Special tests
(IEC 60947-5-4:2002)

Appareillage à basse tension
Partie 5-4: Appareils et éléments de commutation pour circuits de commande - Méthode d'évaluation des performances des contacts à basse énergie - Essais spéciaux
(CEI 60947-5-4:2002)

Niederspannungsschaltgeräte
Teil 5-4: Steuergeräte und Schaltelemente - Verfahren zur Abschätzung der Leistungsfähigkeit von Schwachstromkontakten - Besondere Prüfungen
(IEC 60947-5-4:2002)

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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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

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Foreword

The text of the International Standard IEC 60947-5-4:2002, prepared by SC 17B, Low-voltage switchgear and controlgear, of IEC TC 17, Switchgear and controlgear, was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 60947-5-4 on 2003-12-01.

This European Standard supersedes EN 60947-5-4:1997.

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) 2004-12-01

- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2006-12-01

Annexes designated "normative" are part of the body of the standard.
In this standard, Annexes A and ZA are normative.
Annex ZA has been added by CENELEC.

Endorsement notice

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The text of the International Standard IEC 60947-5-4:2002 was approved by CENELEC as a European Standard without any modification.

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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 60068-1	1988	Environmental testing		
+ corr. October	1988	Part 1: General and guidance		
+ A1	1992		EN 60068-1	1994
IEC 60068-2	Series	Environmental testing	EN 60068-2	Series
		Part 2: Tests	HD 323.2	Series
IEC 60605-6	1997	Equipment reliability testing Part 6: Tests for the validity of the constant failure rate or constant failure intensity assumptions	-	-
IEC 60947-1	1999	Low-voltage switchgear and controlgear	EN 60947-1	1999
(mod)		Part 1: General rules	+ corr. October	1999
A1	2000		A1	2000
A2	2001		A2	2001
IEC 60947-5-1	1997	Part 5-1: Control circuit devices and switching elements - Electromechanical control circuit devices	EN 60947-5-1 + A12	1997 1999
A1	1999		A1	1999
A2	1999		A2	2000
IEC 61131-2	1992	Programmable controllers Part 2: Equipment requirements and tests	EN 61131-2	1994 [1)]

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1) EN 61131-2:1994 is superseded by EN 61131-2:2003 + corrigendum August 2003, which is based on IEC 61131-2:2003.

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NORME INTERNATIONALE

INTERNATIONAL STANDARD

CEI
IEC
60947-5-4

Deuxième édition
Second edition
2002-10

Appareillage à basse tension –

Partie 5-4:
Appareils et éléments de commutation pour circuits de commande – Méthode d'évaluation des performances des contacts à basse énergie – Essais spéciaux

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Low-voltage switchgear and controlgear –

Part 5-4:
Control circuit devices and switching elements – Method of assessing the performance of low-energy contacts – Special tests

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Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 5-4: Control circuit devices and switching elements – Method of assessing the performance of low-energy contacts – Special tests

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.
4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60947-5-4 has been prepared by subcommittee 17B: Low-voltage switchgear and controlgear, of IEC technical committee 17: Switchgear and controlgear.

This second edition cancels and replaces the first edition which was issued as a technical report in 1996. It now has the status of an International Standard.

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

FDIS	Report on voting
17B/1228/FDIS	17B/1254/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.

Some slight modifications, mainly of an editorial nature, have been introduced since the first edition.

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The committee has decided that the contents of this publication will remain unchanged until 2006. At this date, the publication will be

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

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INTRODUCTION

Control switches may not be suitable for use at very low voltages and therefore it is recommended to seek the advice of the manufacturer concerning any application with a low value of operational voltage, for example, below 100 V a.c. or d.c. (see IEC 60947-5-1, note 2 of 4.3.1.1).

However, the development of electronic systems and programmable controllers in industrial processes increases the use of switching elements in low-voltage circuit control.

It is thus necessary to define how predictional behaviour of contacts in this area should be established (with an acceptable confidence level), by using precise conventional testing methods, down to specified values (such as 24 V, 1 mA; 5 V, 10 mA).

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LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 5-4: Control circuit devices and switching elements – Method of assessing the performance of low-energy contacts – Special tests

1 Scope and object

This part of IEC 60947 applies to separable contacts used in the utilization area considered, such as switching elements for control circuits.

This standard takes into consideration two rated voltage areas:

a) above (and including) 10 V (typically 24 V) where contacts are used for switching loads with possible electrical erosion, such as programmable controller inputs;

b) below 10 V (typically 5 V) with negligible electrical erosion, such as electronic circuits.

This standard does not apply to contacts used in the very low energy area of measurement, for example, sensor or thermocouple systems.

The object of this standard is to propose a method of assessing the performances of low energy contacts giving

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– useful definitions;

– general principles of test methods which are to monitor and record the behaviour of contacts at each operation;

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– functional bases for the definition of a general testing equipment;

– preferred test values;

– particular conditions for testing contacts intended for specific applications (such as switching of PC inputs);

– information to be given in the test report;

– interpretation and presentation of the rest results.

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*
Amendment 1 (1992)

IEC 60068-2 (all parts), *Environmental testing – Part 2: Tests*

IEC 60605-6:1997, *Equipment reliability testing – Part 6: Tests for the validity of the constant failure rate or constant failure intensity assumptions*