IEC 60947-5-4

Edition 2.1 2019-05

FINAL VERSION

VERSION FINALE

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

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

IEC 60947-5-4:2002-10+AMD1:2019-05 CSV(en-fr)

CONTENTS

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 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.
2) The formal decisions or agreements of 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 IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

This Consolidated version of IEC 60947-5-4 bears the edition number 2.1. It consists of the second edition (2002-10) [documents 17B/1228/FDIS and 17B/1254/RVD] and its amendment 1 (2019-05) [documents 121A/284/FDIS and 121A/301/RVD]. The technical content is identical to the base edition and its amendment.

This Final version does not show where the technical content is modified by amendment 1. A separate Redline version with all changes highlighted is available in this publication.

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 has the status of an International Standard.

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.

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

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

INTRODUCTION

General usage of 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 60947-5-1:2016, note of 4.3.2.2).

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).

The objective of this document is to ensure the availability of contacts used in this area, including normally-open contacts.

This document shall be used as a complement of IEC 60947-5-1 for low-energy contacts applications.

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 typical 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:

– functional safety area. In case of contacts used in functional safety area, Annex N of IEC 60947-5-1:2016 applies;

– 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

– useful definitions;

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

– 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 60068-1:2013, *Environmental testing – Part 1: General and guidance*

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

IEC 60605-6:2007, *Equipment reliability testing – Part 6: Tests for the validity and estimation of the constant failure rate and constant failure intensity*

IEC 60947-1:2007, *Low-voltage switchgear and controlgear – Part 1: General rules*
Amendment 1 (2010)
Amendment 2 (2014)