



**CSA
Group**

CSA C22.2 No. 60947-5-2:14
(IEC 60947-5-2:1997+A1:1999
+A2:2003, MOD)
National Standard of Canada
(reaffirmed 2019)



CSA C22.2 No. 60947-5-2:14
**Low-voltage switchgear and controlgear — Part 5-2: Control
circuit devices and switching elements — Proximity
switches**
(IEC 60947-5-2:1997+A1:1999+A2:2003, MOD)



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National Standard of Canada
CAN/CSA-C22.2 No. 60947-5-2-14
**Low-voltage switchgear and controlgear —
Part 5-2: Control circuit devices and switching
elements — Proximity switches**
(IEC 60947-5-2:1997+A1:1999+A2:2003, MOD)

Note: For brevity, this Standard will be referred to as “CAN/CSA-C22.2 No. 60947-5-2” throughout.

28 MARCH 2014

This standard is based on IEC 60947-5-2, edition 2.2 (2004), which is based on the second edition (1997), its amendment 1 (1999), and its amendment 2 (2003).

Prepared by
International Electrotechnical Commission



Reviewed by



**CSA
Group**

CSA Group
CAN/CSA-C22.2 No. 60947-5-2-14
First Edition
(IEC 60947-5-2:1997+A1:1999+A2:2003, MOD)



Underwriters Laboratories Inc.
UL 60947-5-2
Third Edition

Approved by



ICS 29.120.40; 29.130.20



ANSI/UL 60947-5-2-2014

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Preface

This is the harmonized CSA Group and UL standard for *Low-Voltage Switchgear and Controlgear – Part 5-2: Control Circuit Devices and Switching Elements – Proximity Switches*. It is the first edition of CAN/CSA-C22.2 No. 60947-5-2, and the third edition of UL 60947-5-2. This standard is based on IEC 60947-5-2, Edition 2.2, which is based on the second edition (1997), and its amendment 1 (1999) and its amendment 2 (2003).

This harmonized standard was prepared by CSA Group and Underwriters Laboratories Inc. (UL). The efforts and support of the Technical Harmonization Committee for Industrial Control Equipment, of the Council on the Harmonization of Electrotechnical Standards of the Nations of the Americas (CANENA), are gratefully acknowledged.

This Standard is considered suitable for use for conformity assessment within the stated scope of the Standard.

This standard was reviewed by the CSA Integrated Committee on Industrial Control, under the jurisdiction of the CSA Technical Committee on Industrial Products and the CSA Strategic Steering Committee on Requirements for Electrical Safety, and has been formally approved by the CSA Technical Committee.

This standard has been approved as a National Standard of Canada by the Standards Council of Canada (SCC).

This standard has been approved by the American National Standards Institute (ANSI) as an American National Standard.

Application of Standard

Where reference is made to a specific number of samples to be tested, the specified number is considered a minimum quantity.

Note: Although the intended primary application of this Standard is stated in its scope, it is important to note that it remains the responsibility of the users of the Standard to judge its suitability for their particular purpose.

This CAN/CSA-C22.2 No. 60947-5-2, Standard for Safety for Low-Voltage Switchgear and Controlgear – Part 5-2: Control Circuit Devices and Switching Elements – Proximity Switches, is to be used in conjunction with the second edition of CAN/CSA-C22.2 No. 60947-1. The requirements for proximity switches are contained in this Part 2 Standard and CAN/CSA-C22.2 No. 60947-1. UL Standard 60947-5-2, Standard for Safety for Low-Voltage Switchgear and Controlgear – Part 5-2: Control Circuit Devices and Switching Elements – Proximity Switches, is to be used in conjunction with the fifth edition of UL 60947-1. The requirements for proximity switches are contained in this Part 2 Standard and UL 60947-1.

Requirements of this Part 2 Standard, where stated, amend the requirements of CAN/CSA-C22.2 No. 60947-1. Requirements of this Part 2 Standard, where stated, amend the requirements of UL 60947-1.

Where a particular subclause of CAN/CSA-C22.2 No. 60947-1 is not mentioned in 60947-5-2, the CAN/CSA-C22.2 No. 60947-1 subclause applies. Where a particular subclause of UL 60947-1 is not mentioned in 60947-5-2, the UL 60947-1 subclause applies.

Level of harmonization

This standard adopts the IEC text with national differences.

This standard is published as an identical standard for CSA Group and UL.

An identical standard is a standard that is exactly the same in technical content except for national differences resulting from conflicts in codes and governmental regulations. Presentation is word for word except for editorial changes.

All national differences from the IEC text are included in the CSA Group and UL versions of the standard. While the technical content is the same in each organization's version, the format and presentation may differ.

Reasons for differences from IEC

National Differences from the IEC are being added in order to address regulatory and safety situations present in the US and Canada.

Interpretations

The interpretation by the standards development organization of an identical or equivalent standard is based on the literal text to determine compliance with the standard in accordance with the procedural rules of the standards development organization. If more than one literal interpretation has been identified, a revision is to be proposed as soon as possible to each of the standards development organizations to more accurately reflect the intent.

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UL effective date

The UL effective date is March 28, 2014.

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NATIONAL DIFFERENCES

GENERAL

National Differences from the text of International Electrotechnical Commission (IEC) Publication 60947-5-2, Low-Voltage Switchgear and Controlgear – Part 5-2: Control Circuit Devices and Switching Elements – Proximity Switches copyright 2004 are indicated by notations (differences) and are presented in bold text.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR – Part 5-2: Control circuit devices and switching elements – Proximity switches

FOREWORD

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International Standard IEC 60947-5-2 has been prepared by subcommittee 17B: Low-voltage switchgear and controlgear, of IEC technical committee 17: Switchgear and controlgear.

This consolidated version of IEC 60947-5-2 is based on the second edition (1997) [documents 17B/833/FDIS and 17B/854/RVD], its amendment 1 (1999) [documents 17B/981/FDIS and 17B/993/RVD] and its amendment 2 (2003) [documents 17B/1298/FDIS and 17B/1310/RVD].

It should be used in conjunction with IEC 60947-5-1.

It bears the edition number 2.2.

A vertical line in the margin shows where the base publication has been modified by amendments 1 and 2.

Annexes A, B, C, D and E form an integral part of this standard.

Annex F is for information only.

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

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

DV.1 D2 Modification of the two statements referencing Annexes:

DV.1.1 Annexes 101.DVA and 101.DVB form an integral part of this standard.

DV.1.2 Annexes A, B, C, D, E and F are informative.

DV.2 D2 Modification of the statement that this standard should be used in conjunction with IEC 60947-5-1:

Replace IEC 60947-5-1 with Annex 101.DVB, Table 101.DVB, Reference No. 3

DV.3 DE Addition of the following:

– **Words in SMALL CAPITALS in the text are defined in clause 2.**

DV.4 DE Addition of the following:

The numbering system in the standard uses a space instead of a comma to indicate thousands and uses a comma instead of a period to indicate a decimal point. For example, 1 000 means 1,000 and 1,01 means 1.01.

LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR – Part 5-2: Control circuit devices and switching elements – proximity switches

1 General

The provisions of the General Rules in part 1 (IEC 60947-1) are applicable to this standard, where specifically called for. General Rules clauses and subclauses thus applicable, as well as tables, figures and appendices, are identified by references to part 1, e.g. subclause 7.1.9.3 of part 1 or annex C of part 1.

Clauses 1 to 8 contain the general requirements. Specific requirements for the various types of PROXIMITY SWITCHES are given in annex A.

1DV D2 Modification of 1 by replacing with the following:

The provisions of the general rules dealt with in Annex 101.DVB, Reference No. 2 are applicable to this standard. Where specifically called for, any references to Part 1 shall be to the referenced clause as amended by the national differences, if any.

1.1 Scope and object

This part of IEC 60947 applies to INDUCTIVE and CAPACITIVE PROXIMITY SWITCHES that sense the presence of metallic and/or non-metallic objects, ULTRASONIC PROXIMITY SWITCHES that sense the presence of sound reflecting objects, PHOTOELECTRIC PROXIMITY SWITCHES that sense the presence of objects and NON-MECHANICAL MAGNETIC PROXIMITY SWITCHES that sense the presence of objects with a MAGNETIC FIELD.

These PROXIMITY SWITCHES are self-contained, have SEMICONDUCTOR SWITCHING ELEMENTS(S) and are intended to be connected to circuits, the rated voltage of which does not exceed 250 V 50 Hz/60 Hz a.c. or 300 V d.c. This Standard is not intended to cover PROXIMITY SWITCHES with analogue outputs.

The object of this standard is to state for PROXIMITY SWITCHES:

- definitions;
- classification;
- characteristics;
- product information;
- normal service, mounting and transport conditions;
- constructional and performance requirements;
- tests to verify rated characteristics.

1.1DV.1 DR Modification of 1.1 by adding 1.1DV.1.1 – 1.1DV.1.2:

1.1DV.1.1 This equipment is for use in ordinary locations in accordance with Annex 101.DVB, Reference No. 1. In Canada, general requirements applicable to this equipment are provided in Reference No. 7 of Table 101.DVB.