# UL 60947-7-4:2026

(IEC 60947-7-4:2013, MOD)

## STANDARD FOR SAFETY

Low-Voltage Switchgear and Controlgear – Part 7-4: Ancillary equipment – PCB terminal blocks for copper conductors

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UL Standard for Safety for Low-Voltage Switchgear and Controlgear – Part 7-4: Ancillary equipment – PCB terminal blocks for copper conductors, UL 60947-7-4

First Edition, Dated April 27, 2018

***Summary of Topics***

***This revision of UL 60947-7-4 dated April 17, 2026 is issued to remove the ANSI logo and approval from the title page, and includes an update to remove the ANCE logo from the title page and ANCE references from the Preface. No technical changes have been made.***

***UL 60947-7-4 is an adoption of IEC 60947-7-4, First Edition, issued by the IEC (2013). Please note that the National Difference document incorporates all of the U.S. national differences for UL 60947-7-4.***

***As noted in the Commitment for Amendments statement located on the back side of the title page, ULSE and CSA are committed to updating this harmonized standard jointly. However, the revisions dated April 17, 2026 will not be jointly issued by ULSE and CSA as these revision pages address removal of ANSI logo and approval, and also includes removing the ANCE logo from the title page and Preface. While ANCE continues to participate in the technical development of this trinational standard, the ANCE logo has been removed from the title page and Preface as standards cannot be formally published in Mexico at this time.***

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# Low-Voltage Switchgear and Controlgear – Part 7-4: Ancillary equipment – PCB terminal blocks for copper conductors

April 27, 2018

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# PREFACE

This is the harmonized CSA Group and ULSE standard for Low-Voltage Switchgear and Controlgear – Part 7-4: Ancillary Equipment – PCB Terminal Blocks for Copper Conductors. It is the First edition of CAN/CSA-C22.2 No. 60947-7-4 and UL 60947-7-4.

This harmonized standard is based on IEC Publication 60947-7-4: Edition 1 (2013), Low-voltage switchgear and controlgear – Part 7-4: Ancillary equipment – PCB terminal blocks for copper conductors, issued August 2013. IEC 60947-7-4 is copyrighted by the IEC.

This harmonized standard was prepared by CSA Group and ULSE. The efforts and support of the Technical Harmonization Subcommittee, THSC 121A WG5, 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.

While ANCE continues to participate in the technical development of this trinational standard, the ANCE logo has been removed from the title page as standards cannot be formally published in Mexico at this time.

This Standard was reviewed by the CSA Subcommittee on Terminal Assemblies, 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 developed in compliance with Standards Council of Canada requirements for National Standards of Canada. It has been published as a National Standard of Canada by CSA Group.

**Application of Standard**

Where reference is made to a specific number of samples to be tested, the specified number is to be 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 is the CAN/CSA-C22.2 No. 60947-7-4 Standard for Low-Voltage Switchgear and Controlgear – Part 7-4: Ancillary Equipment – PCB Terminal Blocks for Copper Conductors. This CSA Group Part 4 is to be used in conjunction with the first edition of CAN/CSA-C22.2 No. 60947-7-1. The requirements for Ancillary Equipment – PCB Terminal Blocks for Copper Conductors are contained in this Part 4 Standard and CAN/CSA-C22.2 No. 60947-7-1. Requirements of this Part 4 Standard, where stated, amend the requirements of CAN/CSA-C22.2 No. 60947-7-1. Where a particular subclause of CAN/CSA-C22.2 No. 60947-7-1 is not mentioned in CAN/CSA-C22.2 No. 60947-7-4, the CAN/CSA-C22.2 No. 60947-7-1 subclause applies.

This is the UL Standard for Safety for Low-Voltage Switchgear and Controlgear – Part 7-4: Ancillary Equipment – PCB Terminal Blocks for Copper Conductors. This UL 60947-7-4, Low-Voltage Switchgear and Controlgear – Part 7-4: Ancillary Equipment – PCB Terminal Blocks for Copper Conductors, is to be used in conjunction with the fourth edition of UL 60947-7-1. The requirements for Ancillary Equipment – PCB Terminal Blocks for Copper Conductors are contained in this Part 4 Standard and UL 60947-7-1. Requirements of this Part 4 Standard, where stated, amend the requirements of UL 60947-7-1. Where a particular subclause of UL 60947-7-1 is not mentioned in UL 60947-7-4, the UL 60947-7-1 subclause applies.

**Level of Harmonization**

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This standard adopts the IEC text with national differences.

This standard is published as an equivalent standard for CSA Group and ULSE.

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All national differences from the IEC text are included in the CSA Group and ULSE 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 safety and regulatory situations present in the US, Canada, and Mexico.

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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 interpretation of the literal text 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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National Differences from the text of International Electrotechnical Commission (IEC) Publication 60947-7-4, Low-Voltage Switchgear and Controlgear – Part 7-4: Ancillary equipment – PCB terminal blocks for copper conductors, copyright 2013, are indicated by notations (differences) and are presented in bold text. The national difference type is included in the body.

There are five types of National Differences as noted below. The difference type is noted on the first line of the National Difference in the standard. The standard may not include all types of these National Differences.

**DR –** These are National Differences based on the **national regulatory requirements**.

**D1 –** These are National Differences which are based on **basic safety principles and requirements**, elimination of which would compromise safety for consumers and users of products.

**D2 –** These are National Differences from IEC requirements based on existing **safety practices**. These requirements reflect national safety practices, where empirical substantiation (for the IEC or national requirement) is not available or the text has not been included in the IEC standard.

**DC –** These are National Differences based on the **component standards** and will not be deleted until a particular component standard is harmonized with the IEC component standard.

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# FOREWORD

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR – Part 7-4: Ancillary equipment – PCB terminal blocks for copper conductors

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 60947-7-4 has been prepared by subcommittee 17B: Low-voltage switchgear and controlgear, of IEC technical committee 17: Switchgear and controlgear.

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

| FDIS | Report on voting |
|---|---|
| 17B/1822/FDIS | 17B/1827/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.

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A list of all parts in the IEC 60947 series, published under the general title *Low-voltage switchgear and controlgear*, can be found on the IEC website.

The committee has decided that the contents of this publication 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.

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**DV.1 DE** ***Add the following paragraph to the IEC Foreword:***

**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.**

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# INTRODUCTION

This standard IEC 60947-7-4 for PCB terminal blocks covers not only the terminal block requirements according to IEC 60947-7 series but also takes into account the specifications of connectors according to IEC 61984 as the requirements for both components are highly similar due to equivalent applications.

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# LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR – Part 7-4: Ancillary equipment – PCB terminal blocks for copper conductors

**DV.2 DC *Modification to Standard Title:***

**Replace "PCB terminal blocks for copper conductors" with "PCB terminal blocks for copper and aluminum conductors".**

## 1 General

### 1.1 Scope

This part of IEC 60947 specifies requirements for PCB terminal blocks primarily intended for industrial or similar use.

Mounting and fixing on the printed circuit board is made by soldering, press-in or equivalent methods to provide electrical and mechanical connection between copper conductors and the printed circuit board.

This standard applies to PCB terminal blocks intended to connect copper conductors, with or without special preparation, having a cross-section between 0,05 $mm^2$ and 300 $mm^2$ (AWG 30/600 kcmil), intended to be used in circuits of a rated voltage not exceeding 1 000 V a.c. up to 1 000 Hz or 1 500 V d.c.

NOTE 1 Large cross section terminal blocks are dedicated to specific design of high current PCBs. The range up to 300 $mm^2$ is kept to cover any possible application. Examples of high current PCBs and PCB terminal blocks are shown in Annex C.

NOTE 2 AWG is the abbreviation of "American Wire Gage" (Gage (US) = Gauge (UK));

kcmil = 1 000 cmil;

1 cmil = 1 circular mil = surface of a circle having a diameter of 1 mil;

1 mil = 1/1 000 inch.

This standard may be used as a guide for special types of PCB terminal blocks with components, such as disconnect units, integrated cartridge fuse-links and the like.

If applicable, in this standard the term "clamping unit" is used instead of "terminal". This is taken into account in case of references to IEC 60947-1.

**1.1DV D2 *Modification by adding the following:***

**1.1DV.1 This standard also applies to terminal blocks that have insulation piercing or displacement clamping units.**

**1.1DV.2 The wire range for terminal blocks covered by this standard include 0,051 $mm^2$ to 300 $mm^2$ (30 AWG to 600 kcmil) copper conductors and 3,31 $mm^2$ to 300 $mm^2$ (12 AWG to 600 kcmil) aluminum conductors. See Annex DVA for aluminum requirements.**

**In Mexico, 3,31 $mm^2$ (12 AWG), 5,26 $mm^2$ (10 AWG), and 8,37 $mm^2$ (8 AWG) aluminum conductors are not allowed.**

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**1.1DV.3 The voltage range includes up to 1500 Vac and 1500 Vdc.**

## 1.2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60068-2-20, *Environmental testing – Part 2-20: Tests – Test T: Test methods for solderability and resistance to soldering heat of devices with leads*

IEC 60352-1, *Solderless connections – Part 1: Wrapped connections – General requirements, test methods and practical guidance*

IEC 60352-2, *Solderless connections – Part 2: Crimped connections – General requirements, test methods and practical guidance*

IEC 60352-3, *Solderless connections – Part 3: Solderless accessible insulation displacement connections – General requirements, test methods and practical guidance*

IEC 60352-4, *Solderless connections – Part 4: Solderless non-accessible insulation displacement connections – General requirements, test methods and practical guidance*

IEC 60352-5, *Solderless connections – Part 5: Press-in connections – General requirements, test methods and practical guidance*

IEC 60352-6, *Solderless connections – Part 6: Insulation piercing connections – General requirements, test methods and practical guidance*

IEC 60352-7, *Solderless connections – Part 7: Spring clamp connections – General requirements, test methods and practical guidance*

IEC 60512-2-1, *Connectors for electronic equipment – Tests and measurements – Part 2-1: Electrical continuity and contact resistance tests – Test 2a: Contact resistance – Millivolt level method*

IEC 60512-4-1, *Connectors for electronic equipment – Tests and measurements – Part 4-1: Voltage stress tests – Test 4a: Voltage proof*

IEC 60512-5-2, *Connectors for electronic equipment – Tests and measurements – Part 5-2: Current-carrying capacity tests – Test 5b: Current-temperature derating*

IEC 60512-11-7, *Connectors for electronic equipment – Tests and measurements – Part 11-7: Climatic tests – Test 11g: Flowing mixed gas corrosion test*

IEC 60512-11-9, *Connectors for electronic equipment – Tests and measurements – Part 11-9: Climatic tests – Test 11i: Dry heat*

IEC 60512-11-10, *Connectors for electronic equipment – Tests and measurements – Part 11- 10: Climatic tests – Test 11j: Cold*

IEC 60695-2-11, *Fire hazard testing – Part 2-11: Glowing/hot-wire based test methods – Glow-wire flammability test method for end-products*

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IEC 60695-2-12, *Fire hazard testing – Part 2-12: Glowing/hot-wire based test methods – Glow-wire flammability index (GWFI) test method for materials*

IEC 60695-2-13, *Fire hazard testing – Part 2-13: Glowing/hot-wire based test methods – Glow-wire ignition temperature (GWIT) test method for materials*

IEC 60947-1:2007, *Low-voltage switchgear and controlgear – Part 1: General rules*; Amendment 1: 2010

IEC 60998-2-3, *Connecting devices for low-voltage circuits for household and similar purposes – Part 2-3: Particular requirements for connecting devices as separate entities with insulation-piercing clamping units*

IEC 60999-1, *Connecting devices – Electrical copper conductors – Safety requirements for screw-type and screwless-type clamping units – Part 1: General requirements and particular requirements for clamping units for conductors from 0,2 mm$^2$ up to 35 mm$^2$ (included)*

IEC 60999-2, *Connecting devices – Electrical copper conductors – Safety requirements for screw-type and screwless-type clamping units – Part 2: Particular requirements for clamping units for conductors above 35 mm$^2$ up to 300 mm$^2$ (included)*

IEC 61210, *Connecting devices – Flat quick-connect terminations for electrical copper conductors – Safety requirements*

ISO 6988, *Metallic and other non-organic coatings – Sulfur dioxide test with general condensation of moisture*

**1.2DV D1 *Modification to add the following:***

**See Annex DVB for standard references.**

## 2 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60947-1, as well as the following, apply.

2.1
**printed circuit board**
**PCB**
piece of insulating material with fixed metal traces to connect electronic components

Note 1 to entry: Printed circuit boards are typically subdivided according to:

– their structure (e.g. single- and double-sided, multilayers);

– the nature of the base material (e.g. rigid, flexible).

2.2
**PCB terminal block**
part intended to be mounted on a printed circuit board and carrying one or more mutually insulated contact units and which provides an electrical and mechanical connection between copper conductor and printed circuit board

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