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

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN IEC 60352-6:2023 sisaldab Euroopa standardi EN IEC 60352-6:2023 ingliskeelset teksti.	This Estonian standard EVS-EN IEC 60352-6:2023 consists of the English text of the European standard EN IEC 60352-6:2023.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
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Standard on kättesaadav Eesti Standardimis-ja Akrediteerimiskeskusest.	The standard is available from the Estonian Centre for Standardisation and Accreditation.

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ICS 29.120.20

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 60352-6

January 2023

ICS 29.120.20

Supersedes EN 60352-6:1997

English Version

Solderless connections - Part 6: Insulation piercing connections - General requirements, test methods and practical guidance (IEC 60352-6:2022)

Connexions sans soudure - Partie 6: Connexions à percement d'isolant - Exigences générales, méthodes d'essai et guide pratique (IEC 60352-6:2022)

Lötfreie Verbindungen - Teil 6: Durchdringverbindungen - Allgemeine Anforderungen, Prüfverfahren und Anwendungshinweise (IEC 60352-6:2022)

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Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

The text of document 48B/3001/FDIS, future edition 2 of IEC 60352-6, prepared by SC 48B "Electrical connectors" of IEC/TC 48 "Electrical connectors and mechanical structures for electrical and electronic equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60352-6:2023.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2023-10-11
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2026-01-11

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In the official version, for Bibliography, the following notes have to be added for the standard indicated:

IEC 60228:2004	NOTE Harmonized as EN 60228:2005 (not modified)
IEC 60512-5-2:2002	NOTE Harmonized as EN 60512-5-2:2002 (not modified)
IEC 60603-7:2020	NOTE Harmonized as EN IEC 60603-7:2020 (not modified)
IEC 61984:2008	NOTE Harmonized as EN 61984:2009 (not modified)
IEC 62430:2019	NOTE Harmonized as EN IEC 62430:2019 (not modified)

IEC 60352-6

Edition 2.0 2022-12

INTERNATIONAL STANDARD

NORME INTERNATIONALE

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

Connexions sans soudure – Partie 6: Connexions à percement d'isolant – Exigences générales, méthodes d'essai et guide pratique

IEC 60352-6:2022-12(en-fr)

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IEC 60352-6

Edition 2.0 2022-12

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

ICS 29.120.20

ISBN 978-2-8322-6085-2

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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SOLDERLESS CONNECTIONS –

Part 6: Insulation piercing connections – General requirements, test methods and practical guidance

FOREWORD

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IEC 60352-6 has been prepared by subcommittee 48B: Electrical connectors, of IEC technical committee 48: Electrical connectors and mechanical structures for electrical and electronic equipment. It is an International Standard.

This second edition cancels and replaces the first edition published in 1997. This edition constitutes a technical revision.

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

a) axial load in 7.2.2 provided in a table in Annex A rather than as percentage of breaking load of the wire;
b) different approach to measure contact resistance provided in 7.3.2.3.

The text of this International Standard is based on the following documents:

Draft	Report on voting
48B/3001/FDIS	48B/3009/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

A list of all parts in the IEC 60352 series, published under the general title *Solderless connections*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

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

INTRODUCTION

This part of IEC 60352 applies to solderless connections made by insulation piercing (IP) and includes requirements, tests and practical guidance information for such connection technology.

Two test schedules are provided:

– a qualification test schedule that applies to insulation piercing connections which conform to all pre-requisites of Clause 5, which are derived from experience with successful applications of such insulation piercing connections;

– an application test schedule that applies to insulation piercing connections made with suitable IP termination which are integral part of a component and are already fulfilling the pre-requisites of Clause 5.

IEC Guide 109 advocates the need to minimize the impact of a product on the natural environment throughout the product life cycle. IEC 62430 provides principles, requirements and guidance to implement environmentally conscious design.

It is understood that some of the materials permitted in this document may have a negative environmental impact. As technological advances lead to acceptable alternatives to these materials, they will be eliminated from this document.

SOLDERLESS CONNECTIONS –

Part 6: Insulation piercing connections – General requirements, test methods and practical guidance

1 Scope

This part of IEC 60352 is applicable to insulation piercing connections made with stranded wires and tinsel wires, insulated flat conductors and flat flexible circuitries for use in electrical and electronic equipment.

Information on materials and data from industrial experience is included in addition to the test procedures to provide electrically stable connections under prescribed environmental conditions.

The object of this document is to:

– determine the suitability of insulation piercing connections under specified mechanical, electrical, and atmospheric conditions;

– provide a means of comparing test results when the tools used to make the connections, if any, are of different designs or manufacture.

There are different designs and materials for insulation piercing terminations in use. For this reason, only fundamental parameters of the termination, the performance requirements of the conductor and the complete connection are specified in this document.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 60512-1:2018, *Connectors for electrical and electronic equipment – Tests and measurements – Part 1: Generic specification*

IEC 60512-1-1:2002, *Connectors for electronic equipment – Tests and measurements – Part 1-1: General examination – Test 1a: Visual examination*

IEC 60512-1-2:2002, *Connectors for electronic equipment – Tests and measurements – Part 1-2: General examination – Test 1b: Examination of dimension and mass*

IEC 60512-2-1:2002, *Connectors for electronic equipment – Tests and measurements – Part 2-1: Electrical continuity and contact resistance tests – Test 2a: Contact resistance – Millivolt level method*

IEC 60512-2-2:2003, *Connectors for electronic equipment – Tests and measurements – Part 2-2: Electrical continuity and contact resistance tests – Test 2b: Contact resistance – Specified test current method*

IEC 60512-2-5:2003, *Connectors for electronic equipment – Tests and measurements – Part 2-5: Electrical continuity and contact resistance tests – Test 2e: Contact disturbance*

IEC 60512-6-4:2002, *Connectors for electronic equipment – Tests and measurements – Part 6-4: Dynamic stress tests – Test 6d: Vibration (sinusoidal)*

IEC 60512-9-2:2011, *Connectors for electronic equipment – Tests and measurements – Part 9-2: Endurance tests – Test 9b: Electrical load and temperature*

IEC 60512-11-1:2019, *Connectors for electrical and electronic equipment – Tests and measurements – Part 11-1: Climatic tests – Test 11a - Climatic sequence*

IEC 60512-11-4:2002, *Connectors for electronic equipment – Tests and measurements – Part 11-4: Climatic tests – Test 11d: Rapid change of temperature*

IEC 60512-11-7:2003, *Connectors for electronic equipment – Tests and measurements – Part 11-7: Climatic tests – Test 11g: Flowing mixed gas corrosion test*

IEC 60512-11-9:2002, *Connectors for electronic equipment – Tests and measurements – Part 11-9: Climatic tests – Test 11i: Dry heat*

IEC 60512-11-10:2002, *Connectors for electronic equipment – Tests and measurements – Part 11-10: Climatic tests – Test 11j: Cold*

IEC 60512-11-12:2002, *Connectors for electronic equipment – Tests and measurements – Part 11-12: Climatic tests – Test 11m: Damp heat, cyclic*

IEC 60512-16-20:1996, *Electromechanical components for electronic equipment – Basic testing procedures and measuring methods – Part 16: Mechanical tests on contacts and terminations – Section 20: Test 16t: Mechanical strength (wired termination of solderless connections)*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1
conductor
part of the cable or wire intended to carry electric current

Note 1 to entry: The conductor may be

a) solid – made of a single strand of circular cross-section;

b) stranded – made of several strands of circular cross-section assembled either by laying up concentrically or by bunching, and without insulation between them.

Note 2 to entry: The properties of the copper are in accordance with IEC 60228.

[SOURCE: IEC 60189-1:2018, 3.1]