

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Connectors for electrical and electronic equipment – Tests and measurements –
Part 15-2: Connector tests (mechanical) – Test 15b: Insert retention in housing
(axial)

Connecteurs pour équipements électriques et électroniques – Essais et mesures –
Partie 15-2: Essais (mécaniques) des connecteurs – Essai 15b: Rétention de
l'isolant dans le boîtier (axial)



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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 31.220.10

ISBN 978-2-8322-5254-3

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**CONNECTORS FOR ELECTRICAL AND ELECTRONIC EQUIPMENT –
TESTS AND MEASUREMENTS –****Part 15-2: Connector tests (mechanical) –
Test 15b: Insert retention in housing (axial)**

FOREWORD

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International Standard IEC 60512-15-2 has been prepared by subcommittee 48B: Electrical connectors, of IEC technical committee 48: Electrical connectors and mechanical structures for electrical and electronic equipment.

This second edition cancels and replaces the first edition, published in 2008. This edition constitutes a technical revision.

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

- The test method B (pressure method) suitable for testing hermetic connector has been added.
- This edition reflects IEC 60512-1-101, Blank detail specification.

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

FDIS	Report on voting
48B/2614/FDIS	48B/2621/RVD

Full information on the voting for the approval of this International 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.

A list of all parts in the IEC 60512 series, published under the general title *Connectors for electrical and electronic equipment – Tests and measurements*, can be found on the IEC website.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

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,
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CONNECTORS FOR ELECTRICAL AND ELECTRONIC EQUIPMENT – TESTS AND MEASUREMENTS –

Part 15-2: Connector tests (mechanical) – Test 15b: Insert retention in housing (axial)

1 Scope

This part of IEC 60512, when required by the detail (product) specification, is used for testing connectors within the scope of technical committee 48. It may also be used for similar devices when specified in a detail (product) specification.

The object of this document is to detail a standard test method to assess the effectiveness of the retaining system of a connector insert within a connector housing to withstand axial forces likely to be encountered during normal use, i.e. the highest insertion and withdrawal forces into/from a mating counterpart, without the connector insert being dislodged from the connector housing.

NOTE The test method detailed in this document is a companion to the one detailed in IEC 60512-15-3 (see Bibliography).

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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 60050-581, *International Electrotechnical Vocabulary – Part 581: Electromechanical components for electronic equipment*

IEC 60512-1, *Connectors for electronic equipment – Tests and measurements – Part 1: General*

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

3 Terms and definitions

For the purposes of this document, terms and definitions given in IEC 60050-581 and IEC 60512-1 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>

4 Preparation

4.1 Test equipment

For the application of the axial forces, a suitable device able to provide the controls on the forces (intensity, rate of increase, time of constant force application) shall be required (e.g.: a universal materials testing machine).

In the case of the axial forces being applied by air or gas pressure, a chamber to contain connectors that may be ejected in case of retention failure shall be provided. If hydraulic pressure is used, such a chamber may not be necessary. However compatibility between materials contained within the specimen and such fluids shall be ensured.

NOTE 1 Where air pressure is used, there is a possibility that contacts, inserts or other objects being ejected at high velocity. Accordingly, it can be necessary to put in place appropriate safety measures.

NOTE 2 If the detail (product) specification requires special preconditioning of the specimen, all the necessary equipment detailed in the relevant documents describing such conditioning would also be required.

4.2 Preparation of specimen

The specimen shall consist of a connector with its terminations, and may be wired if so specified in the detail (product) specification. Cable fittings and accessories shall not be fitted.

4.3 Mounting of specimen

Mounting of the specimen shall be as specified in the detail (product) specification.

5 Test / measuring method

5.1 Pre-conditioning

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Specimens shall be subjected to the preconditioning if required in the detail (product) specification.

5.2 Initial measurements

Visual examination according to IEC 60512-1-1 shall be done.

5.3 Tests

The connector housing shall be fixed in such a manner as not to influence the retention means of the connector insert.

The test shall be carried out using the following test method as specified in the detail (product) specification

Unless otherwise specified, method A shall be used.

- Method A

Axial force specified in the detail (product) specification shall be applied in both directions consecutively, at a constant rate of 25 mm/min, until the specified force is achieved. This shall then be maintained for 1 min.

- Method B

The pressure specified in the detail (product) specification shall be applied in both directions consecutively, at a rate of 5 kPa/s until the specified pressure is achieved. This shall then be maintained for 1 min.

NOTE Method B is suitable to test the hermetic connector.

5.4 Recovery

Specimens shall be subjected to the recovery, if required in the detail (product) specification.

5.5 Final measurements

Displacement caused by the specified force or pressure shall be measured. Any residual displacement after the specified force or pressure is removed shall be measured. These displacements shall be recorded.

Visual examination according to IEC 60512-1-1 shall be done.

6 Details to be specified

When this test is required by the detail (product) specification, the following details shall be specified:

- a) the number of specimen;
 - b) parameters for preconditioning and/or recovery, if required;
 - c) wiring of the specimen, if necessary;
 - d) mounting of the specimen;
 - e) method to be used (Method A or Method B);
 - f) axial force or pressure to be applied;
 - g) requirements, including displacement;
 - h) any other deviation from the standard test method and/or conditions.
- IEC 60512-15-2:2018
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Bibliography

IEC 60512-15-3, *Connectors for electronic equipment – Tests and measurements – Part 15-3: Connector tests (mechanical) – Test 15c: Insert retention in housing (torsional)*

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