BS EN 60512-9-1:2010

BSI Standards Publication

Connectors for electronic equipment — Tests and measurements

Part 9-1: Endurance tests — Test 9a: Mechanical operation

National foreword

This British Standard is the UK implementation of EN 60512-9-1:2010. It is identical to IEC 60512-9-1:2010. It supersedes Test 9a from BS 5772-5:1993, IEC 60512-5:1992, which remains current until all the tests it contains have been revised.

The UK participation in its preparation was entrusted to Technical Committee EPL/48, Electromechanical components and mechanical structures for electronic equipment.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

ISBN 978 0 580 62121 5

ICS 31.220.01

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 May 2010.

Amendments issued since publication

Amd. No.	Date	Text affected

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60512-9-1

April 2010

ICS 31.220.01

English version

Connectors for electronic equipment - Tests and measurements - Part 9-1: Endurance tests - Test 9a: Mechanical operation

(IEC 60512-9-1:2010)

Connecteurs pour équipements électroniques - Essais et mesures - Partie 9-1: Essais d'endurance - Essai 9a: Fonctionnement mécanique (CEI 60512-9-1:2010)

Steckverbinder für elektronische Einrichtungen - Mess- und Prüfverfahren - Teil 9-1: Dauerprüfungen - Prüfung 9a: Mechanische Lebensdauer (IEC 60512-9-1:2010)

This European Standard was approved by CENELEC on 2010-04-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Ref. No. EN 60512-9-1:2010 E

Foreword

The text of document 48B/2018/CDV, future edition 1 of IEC 60512-9-1, prepared by SC 48B, Connectors, of IEC TC 48, Electromechanical components and mechanical structures for electronic equipment, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60512-9-1 on 2010-04-01.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN and CENELEC shall not be held responsible for identifying any or all such patent rights.

The following dates were fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2011-01-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2013-04-01

Annex ZA has been added by CENELEC.

_____

Endorsement notice

The text of the International Standard IEC 60512-9-1:2010 was approved by CENELEC as a European Standard without any modification.

_____

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 60512-1-1	-	Connectors for electronic equipment - Tests and measurements - Part 1-1: General examination - Test 1a: Visual examination	EN 60512-1-1	-
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	EN 60512-2-1	-
IEC 60512-2-6	-	Connectors for electronic equipment - Tests and measurements - Part 2-6: Electrical continuity and contact resistance tests - Test 2f: Housing (shell) electrical continuity	EN 60512-2-6	-
IEC 60512-3-1	-	Connectors for electronic equipment - Tests and measurements - Part 3-1: Insulation tests - Test 3a: Insulation resistance	EN 60512-3-1	-
IEC 60512-4-1	-	Connectors for electronic equipment - Tests and measurements - Part 4-1: Voltage stress tests - Test 4a: Voltage proof	EN 60512-4-1	-
IEC 60512-13-5	-	Connectors for electronic equipment - Tests and measurements - Part 13-5: Mechanical operating tests - Test 13e: Polarizing and keying method	EN 60512-13-5	-

CONNECTORS FOR ELECTRONIC EQUIPMENT – TESTS AND MEASUREMENTS –

Part 9-1: Endurance tests – Test 9a: Mechanical operation

1 Scope and object

This part of IEC 60512, when required by the detail 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 specification.

The object of this standard is to detail a standard test method to assess the mechanical operational endurance of connectors in the normal operating mode, without electrical load.

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

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 60512-2-6: *Connectors for electronic equipment – Tests and measurements – Part 2-6: Electrical continuity and contact resistance tests – Test 2f: Housing (shell) electrical continuity*

IEC 60512-3-1: *Connectors for electronic equipment – Tests and measurements – Part 3-1: Insulation tests – Test 3a: Insulation resistance*

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

IEC 60512-13-5: *Connectors for electronic equipment – Tests and measurements – Part 13-5: Mechanical operation tests – Test 13e: Polarizing and keying method*

3 Preparation of the specimen

The specimen shall be prepared and mounted according to the detail specification.

4 Test method

The specimen shall be subjected to a mechanical operational endurance test in accordance with the requirements of the detail specification (without electrical load).

The specimen shall be operated in the normal manner.

Frequency, number and speed of the operations shall be as stated in the detail specification.

Unless prohibited by the detail specification, mechanical aids which simulate normal operation may be used provided that they do not introduce abnormal stresses.

5 Final measurements

a) Visual examination (IEC 60512-1-1, test 1a).
b) Contact resistance (IEC 60512-2-1, test 2a, as appropriate).
c) Housing (shell) electrical continuity IEC 60512-2-6, (test 2f).
d) Insulation resistance (IEC 60512-3-1, test 3a).
e) Voltage proof (IEC 60512-4-1, test 4a).
f) Mechanical operational characteristics, including effectiveness of keys and polarizing method (IEC 60512-13-5, test 13e).

NOTE If applicable, the detail specification may require a sealing test from the IEC 60512-14 series or an ingress protection test according IEC 60529.

6 Details to be specified

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

a) preparation of the specimen, including type of cable/wire bundle to be used;
b) mounting of the specimen;
c) number, frequency and speed of operations;
d) requirements for final measurements;
e) any deviation from the standard test method.

This page deliberately left blank

This page deliberately left blank

British Standards Institution (BSI)

BSI is the independent national body responsible for preparing British Standards and other standards-related publications, information and services.
It presents the UK view on standards in Europe and at the international level.

It is incorporated by Royal Charter.

Revisions

British Standards are updated by amendment or revision. Users of British Standards should make sure that they possess the latest amendments or editions.

It is the constant aim of BSI to improve the quality of our products and services. We would be grateful if anyone finding an inaccuracy or ambiguity while using this British Standard would inform the Secretary of the technical committee responsible, the identity of which can be found on the inside front cover.

Tel: +44 (0)20 8996 9001 Fax: +44 (0)20 8996 7001

BSI offers Members an individual updating service called PLUS which ensures that subscribers automatically receive the latest editions of standards.

Tel: +44 (0)20 8996 7669 Fax: +44 (0)20 8996 7001
Email: plus@bsigroup.com

Buying standards

You may buy PDF and hard copy versions of standards directly using a credit card from the BSI Shop on the website **www.bsigroup.com/shop.** In addition all orders for BSI, international and foreign standards publications can be addressed to BSI Customer Services.

Tel: +44 (0)20 8996 9001 Fax: +44 (0)20 8996 7001
Email: orders@bsigroup.com

In response to orders for international standards, it is BSI policy to supply the BSI implementation of those that have been published as British Standards, unless otherwise requested.

Information on standards

BSI provides a wide range of information on national, European and international standards through its Knowledge Centre.

Tel: +44 (0)20 8996 7004 Fax: +44 (0)20 8996 7005
Email: knowledgecentre@bsigroup.com

Various BSI electronic information services are also available which give details on all its products and services.

Tel: +44 (0)20 8996 7111 Fax: +44 (0)20 8996 7048
Email: info@bsigroup.com

BSI Subscribing Members are kept up to date with standards developments and receive substantial discounts on the purchase price of standards. For details of these and other benefits contact Membership Administration.

Tel: +44 (0)20 8996 7002 Fax: +44 (0)20 8996 7001
Email: membership@bsigroup.com

Information regarding online access to British Standards via British Standards Online can be found at **www.bsigroup.com/BSOL**

Further information about BSI is available on the BSI website at **www.bsigroup.com/standards**

Copyright

BSI Group Headquarters

389 Chiswick High Road London W4 4AL UK

Tel +44 (0)20 8996 9001
Fax +44 (0)20 8996 7001
www.bsigroup.com/standards

raising standards worldwide™