

Connectors with assessed quality, for use in d.c., low frequency analogue and in digital high speed data applications —

Part 1: Generic specification

The European Standard EN 61076-1:1995, with the incorporation of amendments A1:1996 and A2:2001, has the status of a British Standard

ICS 31.220.10

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Technical Committee EPL/48, Electromechanical components for electronic equipment, to Subcommittee EPL/48/2, Connector for electronic equipment, upon which the following bodies were represented:

- Association of Manufacturers Allied to the Electrical and Electronics Industry (BEAMA Ltd)
- British Telecommunications plc
- Federation of the Electronics Industry
- Ministry of Defence
- National Supervising Inspectorate
- Society of British Aerospace Companies Limited

This British Standard, having been prepared under the direction of the Electrotechnical Sector Board, was published under the authority of the Standards Board and comes into effect on 15 June 1996

© BSI 15 March 2002

The following BSI references relate to the work on this standard:
Committee reference EPL/48/2
Draft for comment 93/212277 DC

ISBN 0 580 25299 X

Amendments issued since publication

Amd. No.	Date	Comments
9507	July 1997	
13537	15 March 2002	Indicated by a sideline

Contents

	Page
Committees responsible	Inside front cover
National foreword	ii
Foreword	2
Text of EN 61076-1	5

National foreword

This British Standard has been prepared by Subcommittee EPL/48/2, and is the English language version of EN 61076-1:1995 *Connectors with assessed quality, for use in d.c., low frequency analogue and in digital high-speed data applications — Part 1: Generic specification — Capability approval*, together with corrigendum 1996 and amendments A1:1996 and A2:2001, published by the European Committee for Electrotechnical Standardization (CENELEC). It is identical with IEC 1076-1:1995, together with the corrigendum November 1995 and amendments 1:1996 and 2:2001, published by the International Electrotechnical Commission (IEC).

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled “International Standards Correspondence Index” or by using the “Find” facility of the BSI Standards Electronic Catalogue.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i to ii, the EN title page, pages 2 to 28, an inside back cover and a back cover.

The BSI copyright notice displayed in this document indicates when the document was last issued.

Sidelining in this document indicates the most recent changes by amendment.

Connectors with assessed quality, for use in d.c., low frequency analogue and in digital high speed data applications — Part 1: Generic specification

(includes amendments A1:1996 and A2:2001)

(IEC 1076-1:1995 + A1:1996 + A2:2001 and corrigendum: 1995)

Connecteurs sous assurance de la qualité, pour utilisation dans le cadre d'applications analogiques en courant continu et à basse fréquence et dans le cadre d'applications numériques utilisant des débits élevés pour le transfert des données —
Partie 1: Spécification générique
(inclut les amendements A1:1996 et A2:2001)
(CEI 1076-1:1995 + A1:1996 + A2:2001 et le corrigendum:1995)

Gütebestätigte Steckverbinder für Gleichspannungs- und Niederfrequenzanwendungen sowie digitale Anwendungen mit hoher Übertragungsrate —
Teil 1: Fachgrundspezifikation
(enthält Änderungen A1:1996 und A2:2001)
(IEC 1076-1:1995 + A1:1996 + A2:2001 und Corrigendum:1995)

This European Standard was approved by CENELEC on 1995-09-20. 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, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

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

Central Secretariat: rue de Stassart 35, B-1050 Brussels

Foreword

The text of document 48B/363/DIS, future edition 1 of IEC 1076-1, 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 61076-1 on 1995-09-20.

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) 1996-07-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 1996-07-01

Annexes designated “normative” are part of the body of the standard.

In this standard, Annex A and Annex ZA are normative.

Annex ZA has been added by CENELEC.

Foreword to amendment A1

The text of document 48B/479/FDIS, future amendment 1 to IEC 1076-1:1995, 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 amendment A1 to EN 61076-1:1995 on 1996-07-02.

The following dates were fixed:

- latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1997-04-01
- latest date by which the national standards conflicting with the amendment have to be withdrawn (dow) 1997-04-01

Foreword to amendment A2

The text of document 48B/1000/FDIS, future amendment 2 to IEC 61076-1:1995, 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 amendment A2 to EN 61076-1:1995 on 2001-07-01.

The following dates were fixed:

- latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2002-04-01
- latest date by which the national standards conflicting with the amendment have to be withdrawn (dow) 2004-07-01

Contents

	Page
Foreword	2
1 General information	5
1.1 Scope	5
1.2 General considerations relating to specifications	5
1.2.1 Sectional specifications	5
1.2.2 Blank detail specifications	5
1.2.3 Detail specifications	6
1.2.4 Conformance to different levels of compatibility	6
1.3 Normative references	7
2 Technical information	8
2.1 Terminology	8
2.2 Classification into climatic categories	8
2.3 Creepage and clearance distances	9
2.4 Current-carrying capacity	9
2.5 IEC type designation	9
2.6 Marking	9
2.6.1 On the connector	9
2.6.2 On the package	9
2.7 Dimensional information	9
2.7.1 Drawings and dimensions	9
2.7.2 Gauges	10

		Page			Page
3	Quality assessment procedures	11	4	Tests and test schedules	23
3.1	Quality assessment definitions	11	4.1	General aspects	23
3.1.1	Primary stage of manufacture	11	4.1.1	Test procedures and measuring methods	23
3.1.2	Structurally similar connectors	12	4.1.2	Preconditioning	23
3.1.3	System of levels	12	4.1.3	Wiring and mounting of specimens	23
3.1.4	Certified record of released lots	13	4.2	Test schedules	24
3.2	Approval of manufacturers, independent test laboratories, and distributors	13	4.3	Grouping of tests	24
3.3	Qualification approval (QA)	13	4.3.1	Test groups for qualification approval testing	24
3.3.1	General	13	4.3.2	Inspection groups for quality conformance inspection	24
3.3.2	Application for qualification approval	13	4.3.3	Test groups for capability approval testing	25
3.3.3	Granting of qualification approval	14	4.4	Delayed delivery	25
3.3.4	Extent of qualification approval	14	4.5	Release for delivery, before completion of “Group B” tests	25
3.3.5	Maintenance of qualification approval	14	4.6	Delivery of tested connectors	25
3.3.6	Suspension or withdrawal of qualification approval	14		Annex A (normative) Common lettering system to be used in drawings	26
3.3.7	Significant changes	14		Annex ZA (normative) Normative references to international publications with their corresponding European publications	27
3.3.8	Qualification approval testing	15		Figure 1 — Simplified flow chart example for capability approval	18
3.3.9	Qualification approval report	15		Table 1 — Climatic categories — Selected values	8
3.4	Capability approval	15			
3.4.1	Capability documentation	15			
3.4.2	Capability assessment procedures	16			
3.4.3	Description of capability	16			
3.4.4	Procedures for capability approval	17			
3.5	Quality conformance inspection	20			
3.5.1	Formation of inspection lots	20			
3.5.2	Small lots and/or expensive connectors	20			
3.5.3	Released lots	20			
3.5.4	Quality conformance inspection groups	21			
3.5.5	Quality conformance testing	22			
3.5.6	In-process testing	22			
3.6	Qualification approval/quality assessment systems	22			
3.6.1	Qualification approval	22			
3.6.2	Design proving or type testing	23			

1 General information

1.1 Scope

This part of IEC 1076 establishes uniform specifications, testing requirements and quality assessment procedures for connectors.

This generic specification is applicable to a family of connectors for use in electronic and electrical equipment. Connectors designed for use at radio frequencies are not covered.

The quality assessment procedures are divided into qualification approval (QA) and capability approval (CA) procedures, of which quality conformance inspection forms a part.

1.2 General considerations relating to specifications

This generic specification contains, or gives reference to, the terms, definitions, symbols, test methods and information relating to the inspection peculiar to connectors, and it also includes test sequences for quality assessment.

It shall be used in conjunction with relevant levels of specifications, with reference to IEC Guide 102:

- sectional specifications;
- detail specifications, including one blank detail specification per sectional specification.

In the event of conflict between this generic specification and the sectional specification, the requirements of the sectional specification prevail.

1.2.1 Sectional specifications

Details appropriate to a particular subfamily of connectors are contained in the relevant sectional specification, e.g. printed board, circular, rectangular connectors and other connecting devices.

It shall contain a choice of all test methods and sequences, severities and preferred values for dimensions and characteristics which could be applicable to that subfamily.

The contents shall be derived from the generic specification.

In the event of conflict between a sectional specification and the detail specification, the requirements of the detail specification shall prevail.

The following sectional specifications are under consideration or in preparation:

- IEC 1076-2: Circular connectors
- IEC 1076-3: Rectangular connectors
- IEC 1076-4: Printed board connectors
- IEC 1076-5: In-line socket devices
- IEC 1076-6: (To be determined)

1.2.2 Blank detail specifications

Guidance to prepare the appropriate detail specifications shall be given in a blank detail specification, prescribing the layout to be adopted, and the information to be given, thus ensuring a uniform presentation.

Its contents shall be derived from the generic or sectional specification and shall list a selection of the technical criteria necessary and sufficient to assess quality of the subject connector subfamily.

The following blank detail specifications are under consideration:

- IEC 1076-2-001: Circular connectors
- IEC 1076-3-001: Rectangular connectors
- IEC 1076-4-001: Printed board connectors
- IEC 1076-5-001: In-line socket devices
- IEC 1076-6-001: (To be determined)

1.2.3 Detail specifications

Detail specifications shall give directly, or by making reference to other normative documents, all information necessary to describe a given connector or range of connectors completely, and to ensure conformance thereof with the requirements for quality assessment under the IECQ.

Their contents shall be derived from the generic or sectional specification, and shall list a selection of the technical criteria necessary and sufficient to assess quality of the subject connector type, and shall be considered complete and sufficient for inspection purposes.

1.2.4 Conformance to different levels of compatibility

As a function of the standardization degree, four levels characterize the compatibility of connectors from different sources. These levels are defined in 1.2.4.1, 1.2.4.2, 1.2.4.3 and 1.2.4.4 and shall, when appropriate, be indicated in the detail specification of the connector.

NOTE If connectors of differing compatibility levels are mated, the lower level prevails.

1.2.4.1 Level 1 — Intermountable

This level standardizes only overall dimensions and mounting dimensions on printed board or panel cut-out and cable termination assembly. Connectors from different sources are not necessarily intermateable.

Information required in a detail specification in order to satisfy this level are: printed board layout, board distances and orientation (parallel or perpendicular) and/or panel cut-out and location. For free-cable connectors, cable termination assembly characteristics shall be specified.

1.2.4.2 Level 2 — Intermateable

This level standardizes only dimensions of electrical and mechanical interfaces.

Electrical, mechanical and climatic performances of connectors from different sources, when mated, are not fully guaranteed.

1.2.4.3 Level 3 — Intermateable and intermountable

This level standardizes mounting dimensions, electrical and mechanical interface and overall dimensions.

Electrical, mechanical and climatic performances of connectors, from different sources, when mated, are not fully guaranteed.

1.2.4.4 Level 4 — Interchangeable

This level standardizes all the elements guaranteeing compliance of the electrical, mechanical and climatic performances of mated connectors when individual connector halves are from different sources.

NOTE The complexity of demonstrating interchangeability at level 4 may be substantial and therefore should be evaluated prior to the level being specified.

1.3 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 1076. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this part of IEC 1076 are encouraged to investigate the possibility of applying the most recent editions of the normative documents listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 50(581):1978, *International Electrotechnical Vocabulary (IEV) — Chapter 581: Electromechanical components for electronic equipment*.

IEC 68-1:1988, *Environmental testing — Part 1: General and guidance* Amendment 1:1992.

IEC 410:1973, *Sampling plans and procedures for inspection by attributes*.

IEC 512-1:1994, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods — Part 1: General*.

IEC 512-2:1985, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods — Part 2: General examination, electrical continuity and contact resistance tests, insulation tests and voltage stress tests*.

IEC 512-3:1976, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods — Part 3: Current-carrying capacity tests*.

IEC 512-4:1976, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods — Part 4: Dynamic stress tests*.

IEC 512-5:1992, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods — Part 5: Impact tests (free components), static load tests (fixed components), endurance tests and overload tests*.

IEC 512-6:1984, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods — Part 6: Climatic tests and soldering tests*.

IEC 512-7:1993, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods — Part 7: Mechanical operating tests and sealing tests*.

IEC 512-8:1993, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods — Part 8: Connector tests (mechanical) and mechanical tests on contacts and terminations*.

IEC 512-9:1992, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods — Part 9: Miscellaneous tests*.

IEC 664-1:1992, *Insulation coordination for equipment within low-voltage systems — Part 1: Principles, requirements and tests*.

IEC Guide 102:1989, *Electronic components — Specification structures for quality assessment (Qualification approval and capability approval)*.

IEC QC 001001:1986, *Basic Rules of the IEC Quality Assessment System for Electronic Components (IECQ)* Amendment 2:1994.

IEC QC 001002:1986, *Rules of Procedure of the IEC Quality Assessment System for Electronic Components (IECQ)* Amendment 2:1994.

IEC QC 001003:1988, *Guidance documents* Amendment 2:1994.

ISO 129:1985, *Technical drawings — Dimensioning — General principles, definitions, methods of execution and special indications*.

ISO 286-1:1988, *ISO system of limits and fits — Part 1: Bases of tolerances, deviations and fits*.

ISO 286-2:1988, *ISO system of limits and fits — Part 2: Tables of standard tolerance, grades and limit deviations for holes and shafts*.

ISO 1000:1992, *SI units and recommendations for the use of their multiples and of certain other units*.

ISO 1101:1983, *Technical drawings — Geometrical tolerancing — Tolerancing of form, orientation, location and run-out — Generalities, definitions, symbols, indications on drawings*.

ISO 1302:1992, *Technical drawings — Method of indicating surface texture*.