

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

Part 7: Cable outlet accessories with assessed quality, including qualification and capability approval — Sectional specification

The European Standard EN 61076-7:2000 has the status of a
British Standard

ICS 31.220.10

National foreword

This British Standard is the official English language version of EN 61076-7:2000. It is identical with IEC 61076-7:2000.

The UK participation in its preparation was entrusted by Technical Committee EPL/48, Electromechanical components for electronic equipment, to Subcommittee EPL/48/2, Connectors for electronic equipment, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

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

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Cross-references

Attention is drawn to the fact that CEN and CENELEC Standards normally include an annex which lists normative references to international publications with their corresponding European publications. The British Standards which implement these international or European publications 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.

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This British Standard, having been prepared under the direction of the Electromechanical Sector Committee, was published under the authority of the Standards Committee and comes into effect on 15 June 2001

Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 39, and a back cover.

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

Amendments issued since publication

Amd. No.	Date	Comments

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ISBN 0 580 37389 4

**Connectors for use in d.c., low-frequency analogue and
digital high speed data applications
Part 7: Cable outlet accessories with assessed quality,
including qualification and capability approval -
Sectional specification
(IEC 61076-7:2000)**

Connecteurs sous assurance de la
qualité, pour applications analogiques
en courant continu et à basse fréquence
et pour applications numériques utilisant
des débits élevés pour le transfert
des données
Partie 7: Accessoires de sorties de câbles
sous assurance de la qualité, y compris
homologation et agrément de savoir-faire
Spécification intermédiaire
(CEI 61076-7:2000)

Steckverbinder für Gleichspannungs-
und Niederfrequenzanwendungen
sowie digitale Anwendungen mit
hoher Übertragungsrate
Teil 7: Kabelausgangszubehör mit
bewerteter Qualität, einschließlich
Bauartanerkennung und Befähigungs-
anerkennung - Rahmenspezifikation
(IEC 61076-7:2000)

This European Standard was approved by CENELEC on 2000-09-01. 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.

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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/863/FDIS, future edition 1 of IEC 61076-7, 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 61076-7 on 2000-09-01.

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) 2001-06-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2003-09-01

Annexes designated "normative" are part of the body of the standard.
In this standard, annexes A, B, C, D, E and ZA are normative.
Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61076-7:2000 was approved by CENELEC as a European Standard without any modification.

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CONNECTORS FOR USE IN DC, LOW-FREQUENCY ANALOGUE AND DIGITAL HIGH SPEED DATA APPLICATIONS –

Part 7: Cable outlet accessories with assessed quality, including qualification and capability approval – Sectional specification

1 General

1.1 Scope

This part of IEC 61076 establishes uniform specifications, type test requirements and quality assessment procedures for cable outlet accessories as well as rules for the preparation of detail specifications for cable outlet accessories of assessed quality for connectors for frequencies below 3 MHz.

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

NOTE When selecting an approved rear accessory and connector, guidance shall be sought from the manufacturer or ONS to ensure compatibility.

1.2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 61076. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of IEC 61076 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standard.

IEC 60050(581), *International Electrotechnical Vocabulary (IEV) – Chapter 581: Electro-mechanical components for electronic equipment*

IEC 60068 (all parts), *Environmental testing*

IEC 60410, *Sampling plans and procedures for inspection by attributes*

IEC 60512 (all parts), *Electromechanical components for electronic equipment – Basic testing procedures and measuring methods*

QC 001002 (all parts), *IEC Quality Assessment System for Electronic Components (IECQ) – Rules of Procedure*

QC 001005, *Register of Firms, Products and Services approved under the IECQ System, including ISO 9000*

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

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

CECC 00109:1974, *Rule of procedure 9: Certified test records*

2 Technical

2.1 Terminology

The terminology used in, and applicable to, this specification is included in IEC 60050(581); IEC 60512 also contains applicable terms.

For the purpose of this specification, the following additional terms and definitions shall apply:

- Backshell: Non-preferred term, use cable outlet.
- Cable tie: A flexible strap or cord for securing a cable bundle to a cable outlet.
- Coupling nut: An accessory or part of a component which secures the cable outlet to the body of the connector.

2.2 Classification into climatic categories

The cable outlet accessories are classified into climatic categories in accordance with the general rules given in IEC 60068-1.

The following preferred temperature ranges and severities of the damp heat, steady-state tests have been selected.

Table 1 – Climatic categories – Selected values

Climatic category	Temperature range	Damp heat, steady state in days	Identification code *
65/350/56	–65 °C to +350 °C	56	U
65/260/56	–65 °C to +260 °C	56	T
65/200/56	–65 °C to +200 °C	56	S
65/175/56	–65 °C to +175 °C	56	X
65/155/56	–65 °C to +155 °C	56	R
55/155/56	–55 °C to +155 °C	56	O
55/125/56	–55 °C to +125 °C	56	Y
55/125/21	–55 °C to +125 °C	21	P
40/100/21	–40 °C to +100 °C	21	N
40/100/10	–40 °C to +100 °C	10	M
25/085/21	–25 °C to + 85 °C	21	L
25/070/10	–25 °C to + 70 °C	10	K
10/070/04	–10 °C to + 70 °C	04	I

* Identification code to be used for IEC designation.

2.3 Material

The materials to be used shall be in accordance with the requirements of the detail specification. When dissimilar materials are employed in intimate contact with each other, adequate protection against corrosion shall be used.

2.4 Finish

The finish shall be in accordance with the detail specification. The following preferred finishes have been selected.

Table 2

Finish	Code
Black anodise	A
Electroless nickel	N
Cadmium plated, bronze-green chromate conversion (48 h NaCl)	B
Nickel, cadmium plated, bronze-green chromate conversion (500 h NaCl)	W
Copper alloy, passivated	C
Stainless steel, passivated	K
Zinc-nickel	D
Zinc-cobalt	E
Without finish	X

2.5 Styles

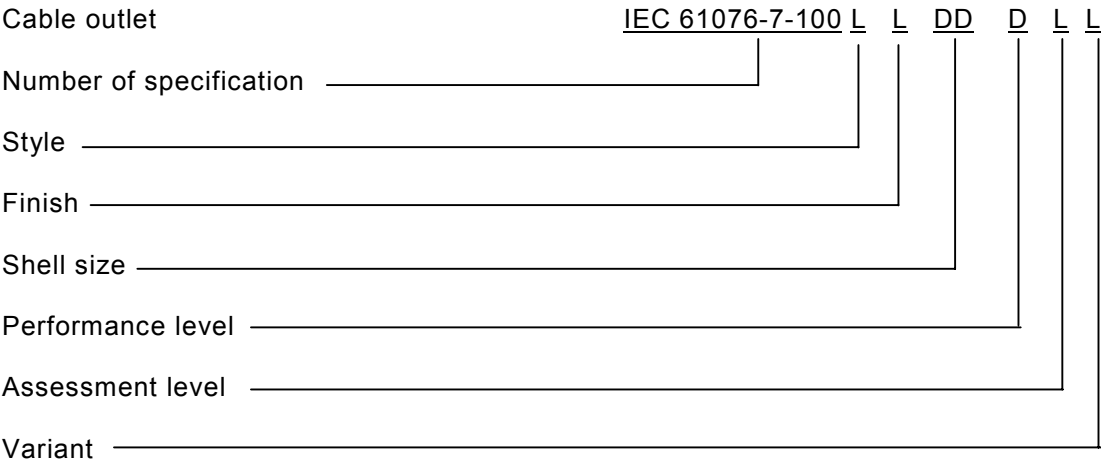
The cable outlet shall be divided into the following styles.

Table 3

Style	Code
Cable outlet, unsealed	A
Cable outlet, sealed	B
Cable outlet, shielded, unsealed	C
Cable outlet, shielded, sealed	D
Conduit adapter, unsealed	E
Conduit ADAPTOR, sealed	F
ADAPTER, unsealed	G
ADAPTER, sealed	H
ADAPTER for heat shrinkable moulded part (shrinkboot)	I
ADAPTER for heat shrinkable moulded part (shrinkboot) shielded	K

2.6 IEC type designation

All cable outlet accessories conforming to this standard shall be identified by the following indications and in the order given.



Where the detail specification provides for a variation of performance and assessment levels, a single letter and a digit shall be used to denote performance level (PL) and assessment level (AL) respectively. The letter and digit shall be prescribed in the detail specification.

2.7 Marking

Each cable outlet and its associated package shall be marked in accordance with the requirements specified in 2.6 of IEC 61076-1.

2.8 Installation instructions and tools

According to the detail specification.

2.9 Delivery conditions

2.9.1 Packaging

The cable outlets shall be packed in transparent, inert plastic bags. The designation affixed on the packaging shall be in conformity with the detail specification.

2.9.2 Storage

Storage shall be in a place free from ultraviolet rays, temperature and humidity extremes. Every five years, an inspection shall be made. The date of inspection shall be marked and the product repackaged in accordance with 2.9.1.

3 Quality assessment procedures

Essentially, the IEC Quality Assessment System for electronic components is based on three concepts:

- The manufacturer shall fulfil certain specified requirements (e.g., regarding organisation, see also 3.5).
- The component shall be qualified (i.e., it shall successfully have passed a qualification approval testing and its qualification shall be approved, see also 3.6).
- The quality of the components produced for being delivered shall comply with the relevant specification (i.e., the quality shall be inspected and the result of this inspection shall be recorded, see also 3.7).

Details are given in the Basic Rules and in this specification.

3.1 Primary stage of manufacture

The primary stage of manufacture, as defined in QC 001002, is the first process subsequent to the manufacture of finished piece parts and sub-assemblies. A sub-assembly is defined as the permanent assembly of two or more piece parts.

This primary stage of manufacture and all subsequent processes shall be carried out under the direct surveillance of the manufacturer's approved Chief Inspector. Subcontractors may carry them out providing equivalent disciplines apply.

3.2 Structurally similar components

Cable outlet accessories having the same basic design and the same surface finish are considered to be structurally similar components as defined in QC 001002. They may be different in other features, such as shell size, etc., but the same manufacturing process and method must have produced them.

Structurally similar components may be covered by one common or by several detail specifications.

Components covered by one common detail specification may usually be considered to be structurally similar. Additional details may be prescribed in the detail specification.

For different surface finish, material and manufacture method, additional specimens have to be defined in the detail specification.

For the purpose of quality conformance inspection and of sampling, all structurally similar components may be aggregated into one inspection lot.

3.3 System of levels

The term "level" is used with the following different meanings and should be clearly distinguished. The detail specification may contain more than one level or a combination of levels. Details of the levels and their combinations shall be specified in the detail specification. Their designation shall be in accordance with 2.6.

3.3.1 Performance level

The term “performance level” reflects a grouping of the environmental and mechanical stresses to which a component is tested and also such features as long-term stability of electrical characteristics. It is based on four factors:

- Climatic category
- The test schedule
- The severities of the test conditions (magnitude and combination of stress)
- The end-of-test requirements

It also permits the following differences between levels to be stated:

- Further characteristics to be specified in addition to those that are mandatory
- Different (closer) tolerances on characteristics
- Different severities for environmental testing

A variation in one or more of these factors will result in a different performance level.

Clause 4 of this specification contains a basic (minimum) test schedule, and a full test schedule. Both schedules are explicitly given while an “intermediate test schedule” is mentioned together with instructions on how to specify an intermediate test schedule. These test schedules together with the severities to be applied and requirements to be fulfilled, as specified in the detail specification, define the performance levels of the component.

A given component with its type designation has one performance level only. If two components differ in their performance levels, they must be considered as two different components and they must have different type designations.

For designating performance levels within any single detail specification, a number 1 to 9 shall be used. The numbers shall be random.

3.3.2 Assessment level

An assessment level is the combination of sample size and number of defectives permitted.

For fixed sample size, the number of specimens to be tested and the number of defectives permitted define the assessment level. Fixed sample sizes are usually applied for qualification approval testing and for periodic tests within quality conformance inspection.

For variable sample size, the assessment level is defined by the “Inspection Level (IL)”, and the “Acceptable Quality Level (AQL)”. Variable sample sizes are usually applied for lot-by-lot tests.

For designation of assessment levels within any single detail specification, the letters A and H shall be used as indicated in table 9, where A is the lowest permitted level. For other assessment levels, other letters may be used in a random manner (for example Y for military application).

3.3.3 Inspection level (IL)

The inspection level determines the sample size relative to the lot size (see IEC 60410).

3.3.4 Acceptable quality level (AQL)

The acceptable quality level is defined in IEC 60410 as the maximum per cent defective that can be considered satisfactory as a process average. For further information, see IEC 60410.

3.4 Grouping of tests

In this specification, two different systems of grouping tests are used which should be clearly distinguished.

3.4.1 Test groups for qualification approval testing

Clause 4 of this specification contains test schedules. The test schedules are subdivided into test groups P, AP, BP and CP. In each test group, a specified number of specimens have to undergo a number of specified tests. For qualification approval, tables 4 to 8 specify the same test schedules and test groups and additionally preferred acceptance criteria (such as the number of specimens to be tested and the number of defectives permitted). By specifying all these details fixed rules are established and the qualification approval becomes a standardised procedure. The groups described in this subclause and used for qualification testing are called “qualification approval test groups” or “QA test groups”.

3.4.2 Inspection groups for quality conformance inspection

For the purpose of quality conformance inspection, usually a smaller number of tests are applied, since certain tests are significant for qualification approval testing only, but not for inspecting the current production. Some of the tests are applied on a lot-by-lot basis, either 100 % or using sampling procedures, while it is sufficient to apply others at shorter or longer intervals only. The periodicity of these tests may be between one and 36 months.

For many reasons it is convenient to combine the tests into groups according to the application of the tests. These groups are called “quality conformance inspection groups” or “QC inspection groups” (or shorter “inspection groups”).

The following grouping has been found convenient:

- lot-by-lot tests, applied either 100 % or using sampling procedures (QC inspection groups A and B, see tables 9 and 10).
- periodic tests for quality conformance inspection (QC inspection group C, see table 11).
- periodic tests for attainment or maintenance of qualification approval (QC inspection group D, see table 12).

3.4.3 Delayed delivery

Cable outlet accessories held for a period exceeding 36 months (unless otherwise specified in the detail specification) following the release of the lot, shall, before delivery, be re-examined as specified in the detail specification. Once a lot has been satisfactorily re-inspected, its quality is reassured for a period of a further 36 months or as specified in the detail specification.

3.4.4 Release for deliveries before the completion of group B tests

When the conditions of IEC 60410 for changing to reduced inspection have been satisfied for all group B tests, the manufacturer is permitted to release components before the completion of such tests.