

Harmonized system of quality assessment for electronic components — Sectional specification including blank detail specification: Lever switches

UDC [621.3.03:006.83]:621.316.542.1:(083.74)

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW



Document Sharing Hub

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Electronic Components Standards Committee (ECL/-) to Technical Committee ECL/21 upon which the following bodies were represented:

- British Telecommunications plc
- Electronic Components Industry Federation
- Electronic Engineering Association
- Ministry of Defence
- National Supervising Inspectorate
- Society of British Aerospace Companies Ltd.
- Telecommunication Engineering and Manufacturing Association

The following bodies were also represented in the drafting of the standard, through subcommittees and panels:

- Association of Control Manufacturers [TACMA (BEAMA Ltd.)]
- BEAMA Ltd.

This British Standard, having been prepared under the direction of the Electronic Components Standards Committee, was published under the authority of the Board of BSI and comes into effect on 31 January 1989

© BSI 11-1999

The following BSI references relate to the work on this standard:
Committee reference ECL/21
Draft for comment 84/20841 DC

ISBN 0 580 16852 2

Amendments issued since publication

Amd. No.	Date of issue	Comments

Contents

	Page
Committees responsible	Inside front cover
National foreword	ii
Foreword	iii
Text of CECC 96200	1
Publications referred to	Inside back cover

National foreword

This British Standard has been prepared under the direction of the Electronic Components Standards Committee. It is identical with CENELEC Electronic Components Committee (CECC) 96002:1986 “*Harmonized system of quality assessment for electronic components: Blank detail specification: Lever switches*”, which is renumbered and retitled by an Erratum as follows: CECC 96200 “*Harmonized system of quality assessment for electronic components: Sectional specification including blank detail specification: Lever switches*”. This standard is being published after ratification but before the Erratum is issued and the necessary changes have been incorporated.

This standard is a harmonized specification within the CECC system.

Terminology and conventions. The text of the CECC specification has been approved as suitable for publication as a British Standard without deviation. Some terminology and certain conventions are not identical with those used in British Standards; attention is drawn especially to the following.

The comma has been used throughout as a decimal marker. In British Standards it is current practice to use a full point on the baseline as the decimal marker.

Cross-references

International Standard	Corresponding British Standard
CECC 96000:1985	BS CECC 96000:1987 <i>Harmonized system of quality assessment for electronic components: Generic specification: Electromechanical switches</i> (Identical)

The Technical Committee has reviewed the provisions of CECC 00200 and CECC 00300, to which reference is made in the text, and has decided that they are acceptable for use in conjunction with this standard.

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 and ii, the CECC title page, pages ii to vi, pages 1 to 46, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Förderverein für Elektrotechnische Normung (FEN) e. V.
Cenelec Electronic Components Committee

CECC

English version

Harmonized System of Quality Assessment for
Electronic Components

SECTIONAL SPECIFICATION
INCLUDING BLANK DETAIL
SPECIFICATION:

LEVER SWITCHES

Système Harmonisé d'Assurance de la Qualité
des Composants Electroniques

SPECIFICATION INTERMEDIAIRE
Y COMPRIS SPECIFICATION
PARTICULIERE CADRE:

INTERRUPTEURS A LEVIER



1

Edition
Issue
Ausgabe

CECC 96200

1986

Contents

	Page
Foreword	iii
1 Basic information	2
2 Ratings and characteristics	2
3 Marking information	2
4 Ordering information	3
5 Related documents	3
6 Certified test records	3
7 Structural similarity	3
8 Delayed delivery	3
9 Additional information	3
Table 1 — Test schedule for quality conformance inspection, assessment level D	4
Table 2 — Test schedule for quality conformance inspection, assessment level R	18
Table 3 — Inspection requirements for fixed sample size qualification approval for assessment level D	23
Table 4 — Inspection requirements for fixed sample size qualification approval for assessment level R	40

Foreword

The CENELEC Electronic Components Committee (CECC) is composed of those member countries of the European Committee for Electrotechnical Standardization (CENELEC) who wish to take part in a harmonized System for electronic components of assessed quality.

The object of the System is to facilitate international trade by the harmonization of the specifications and quality assessment procedures for electronic components, and by the grant of an internationally recognized Mark, or Certificate, of Conformity. The components produced under the System are thereby accepted by all member countries without further testing.

This specification has been formally approved by the CECC, and has been prepared for those countries taking part in the System who wish to issue national harmonized specifications for Lever Switches. It should be read in conjunction with the current regulations for the CECC System.

At the date of printing of this specification the member countries of the CECC are Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Preface

This blank detail specification was prepared by CECC Working Group 24: Switches.

It is based, wherever possible, on the publications of the International Electrotechnical Commission.

The text of this sectional specification was circulated to the CECC for voting in the document listed below and was ratified by the President of the CECC for printing as a CECC Specification.

Document	Voting date	Report on the voting
CECC(Secretariat)1483	May 1984	CECC(Secretariat)1645

This specification is published in English and French only.

Scope

This publication shall act as a sectional specification under CECC 96000 and in addition provides a blank detail specification.

The preparation of detail specifications

General instructions

Detail specifications for lever switches shall be prepared by completing the following pro-forma as indicated by the guidelines given below and in accordance with CECC 96000. The layout given shall be adhered to as closely as is practicable.

Each detail specification shall relate to only one type of lever switch as defined in **2.2.3()** of CECC 96000, and to one assessment level, but may if found convenient cover more than one style of that type and/or number of variants within each style. For lever switches, “style” and “variant” have meanings as defined below.

The style of a lever switch of a given type is determined by the following parameters:

- current and voltage ratings
- climatic category

Switches for which it is wished to claim structural similarity shall be of the same type and style, in accordance with **3.2** of CECC 96000.

The variants within a style of lever switch are determined, for example, by the following parameters:

- number of poles
- bushing
- sealing
- lever
- terminations
- contact arrangement

The DS shall contain all the necessary information to identify the particular type, style(s) and variant(s) of lever switch which it covers. This information shall include at least the following:

- a) Ratings and characteristics
 - 1) Ratings and characteristics shall be taken from the preferred list given in **2.3** of CECC 96000 unless more severe values are to be prescribed.
 - 2) Proof voltage shall be determined as stated in **4.3.4(4-1)** of CECC 96000.
- b) Detailed dimensions including mounting.
- c) Number of poles.
- d) Bushing type.
- e) Sealed or non-sealed.
- f) Lever form.
- g) Lever positions and mechanical operating characteristics.
- h) Terminations.
- i) Contact arrangement.
- j) Indication/illumination.
- k) Assessment level.

Terminology

The terminology used shall be in accordance with **2.2** of CECC 96000. Any further special terms which are found necessary shall be defined in the detail specification.

Detailed instructions for completion of a detail specification

A completed detail specification shall consist of

1. a front page identifying the specification and the component
2. one or more pages of technical information
3. a test schedule

These shall be prepared in accordance with the following instructions.

1 Front page

The front page is intended to formally identify the specification and to provide sufficient technical information for the user to identify the general features of the switch and its principal characteristics. Its layout shall be as shown on page 1. The numbers between square brackets on page 1 refer to details which shall be inserted in accordance with items [1] to [9] below:

- [1] The name of the National Standards Organization under whose authority the detail specification is published, followed by the manufacturer's name and address if appropriate.
- [2] The CECC symbol and the number allocated by the CECC General Secretariat.
- [3] The number and issue number of the CECC generic specification; also national reference if different.

[4] If different from the CECC number, the national number, date of issue and any further information required by the national system, together with any amendment numbers.

[5] A statement of the class and sub-class (where applicable) of switch, as listed in 1.2 of CECC 96000.

[6] Information on principal features of construction, such as provision of illumination, sealing, special mounting or termination facilities. It shall be staged if the switch is suitable for printed wiring applications.

For [5] and [6] the text shall be suitable for an entry in CECC 00200 (QPL) and CECC 00300 (Library list).

[7] An outline drawing with main dimensions which are of importance for inter-changeability, and/or reference to the appropriate national or international document for outlines. Alternatively, this drawing may be given in an appendix. Dimensions shall be given in millimetres.

[8] Level of quality assessment, in accordance with 3.1 below and with 3.4 of CECC 96000.

[9] The principal ratings and characteristics of the switch. Those parameters which are not subject to lot-by-lot or periodic inspection shall be clearly identified as such.

2 Technical information

This section shall provide full technical details and performance characteristics of the switch, together with any other information required by the user. It shall be prepared by completing pages 1 and 2 in accordance with the instructions given on those pages within square brackets.

3 Test schedule

3.1 This section shall fully identify the schedule of tests to which the component is subjected for quality conformance inspection and for qualification approval. Two alternative assessment levels, level D and level R, are provided for switches, and are detailed in Table 1 and Table 2 respectively: one of these levels shall be selected for preparation of the DS, depending upon the nature of the switch and its intended application. It is not permitted to delete inspection and test requirements from those laid down by the relevant table unless these are indicated as “if applicable”, but assessment levels intermediate between levels R and D, or more severe than level D, may be created by the introduction of additional tests and/or by tightened inspection levels. When such enhanced assessment levels are created, this shall be indicated in box [8] of page 1 by inserting “D +” or “R +” as appropriate.

3.2 The pro-forma test schedules for quality conformance inspection are given in Table 1 and Table 2 for levels D and R respectively. The appropriate table shall be completed with conditions of test and performance requirements as specified in 4.3 of CECC 96000 for each test, and in accordance with the instructions given in the table in square brackets.

3.3 When the fixed sample size procedure is adopted for obtaining qualification approval in accordance with 3.3.3 of CECC 96000, Table 3 (level D) or Table 4 (level R) shall be completed and used as appropriate. The conditions of test and the performance requirements shall be identical to those prescribed for quality conformance inspection in the completed Table 1 or Table 2.

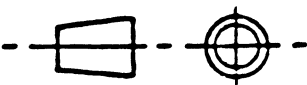
Table 3 and Table 4 are not required to be published as part of the detail specification.

3.4 When it is intended to reduce the number of contact sets tested, as permitted by **4.2** of CECC 96000, the following shall be stated in the test schedules for each relevant sub-group:

- number of samples to have all their contact sets tested (minimum permitted = 50 % of the samples in each sub-group);
- total number of contact sets to be tested (minimum permitted = 1 set per switch on the rest of the samples).

3.5 When it is intended to apply tests additional to those specified by the following tables, the test methods shall be clearly detailed, either by reference to the relevant test number in **4.3** of CECC 96000 or, where the test is not defined by CECC 96000, by stating in full the test method to be applied.

Recommended layout for detail specifications for switches of assessed quality

[1]	Page of	[2] 
ELECTRONIC COMPONENT OF ASSESSED QUALITY: DETAIL SPECIFICATION IN ACCORDANCE WITH CECC 96000:1985 [3]	[4]	
OUTLINE AND DIMENSIONS (mm)  First angle projection [7] NOTE Other shapes are permitted within the dimensions given		LEVER SWITCH [5] PRINCIPAL CONSTRUCTIONAL FEATURES [6] LEVEL OF QUALITY ASSESSMENT [8]
PRINCIPAL RATINGS AND CHARACTERISTICS [9]		
Information about manufacturers who have components qualified to this detail specification is available in the current CECC 00200: Qualified Products List		

1 Basic information

1.1 General

(A statement of the principal usage features of the device; for example “panel mounting, high current, extended life”.)

1.2 Range and variants available

(To include such details as number of poles, types of contacts, contact arrangements and lever types; for example “one and two poles, 10 mm diameter, bush mounting, sealed, with tab terminations”.)

2 Ratings and characteristics

(Additional parameters may be stated where relevant. Values for all parameters shall be selected as prescribed in 2.3 of CECC 96000. Characteristics and ratings are required to be stated only if called up by the test schedule for the relevant assessment level.)

2.1 Electrical ratings

Maximum and minimum switched	---- V (a.c. and/or d.c.)
Rated voltage	---- V (a.c. and/or d.c.)
Maximum and minimum switched current	---- A (a.c. and/or d.c.)
Maximum switched power	---- VA (a.c. and/or d.c.)
Maximum and minimum carrying current	---- A (a.c. and/or d.c.)

2.2 Environmental ratings

Climatic category	----/----/----
Shock severity	---- m/s ² ; ----s; ---- shocks in each plane
or	
Bump severity	---- m/s ² ; ---- bumps; duration of each bump 6 ms
Vibration	10 Hz to ---- Hz; displacement 0,75 mm; acceleration 98 m/s ² (10 g); duration ----
Low air pressure	---- kPa (----- mbar)
Sealing	---- kPa (----- mbar) (conditions to be stated in accordance with 4.3.14 of CECC 96000)

2.3 Mechanical characteristics

Operating force	---- N (min.), ---- N (max.)
Mechanical endurance	---- operations without load

2.4 Electrical characteristics

Electrical endurance	---- cycles (conditions to be stated)
Maximum initial contact resistance	---- mΩ (conditions to be stated)
Maximum final contact resistance	---- mΩ (conditions to be stated)
Minimum initial insulation resistance	---- MΩ (conditions to be stated)
Minimum final insulation resistance	---- MΩ (conditions to be stated)
Voltage proof	---- V r.m.s. (in accordance with 4.3.4 of CECC 96000)
Capacitance	---- pF (conditions to be stated)

3 Marking information

(In accordance with 2.4 of CECC 96000.)

4 Ordering information

Orders for lever switches covered by this specification shall contain the following information:

- Number of the detail specification
- Details of manufacturer's codes for specific variants. (If appropriate. Information on the codes for variants may take the form of an appendix showing a typical ordering sheet.)

5 Related documents

CECC 96000.

(Any other documents referred to in this specification shall be listed.)

6 Certified test records

(State either not required or required in accordance with 3.5 of CECC 96000. If Certified Test Records are required their contents shall be defined.)

7 Structural similarity

(State either not applicable or to be applied in accordance with 3.2 of CECC 96000. If applied, details of the grouping procedures shall be given.)

8 Delayed delivery

(Either state in accordance with 3.6 of CECC 96000, or state any deviation therefrom.)

9 Additional information

(Not for inspection purposes except where stated.)

(The following optional details may be given; this information may be presented in the form of an appendix.

- Unchecked parameters: information concerning factors (such as materials and flammability) which are not subject to regular quality conformance inspection but which may be of significance in selecting a switch for an application. Where basically equivalent components are available from more than one manufacturer, information may be provided in respect of detail differences.
- Special contractual information: any additional information demanded by special contractual requirements and which is required to be verified by a stated inspection procedure.
- Special details: any other information intended to assist the user in the application of the components.)

Table 1 — Test schedule for quality conformance inspection, assessment level D

Group A (non-destructive)**To be conducted on a sampling basis, lot-by-lot**

Sub-group	Test and measurements						
	Title	a or i.a.		Conditions of test See individual test methods in 4.3 of CECC 96000	IL	AQL	Requirements
A1	Visual examination	a		1-1 (note 1)	I	1,5 %	(Note 1)
A2	Outline dimensions	a		1-2 (note 1)	S3	1 %	(Note 1)
A3	Functional operation	a		1-7 (note 1)	II	1 %	(Note 1)
A4	Initial contact resistance	a		<u>Either</u> 2-1 (notes 1 & 2) <u>or</u> 2-2 (notes 1 & 2)	S3	1,5 %	---- mΩ max. (as in 2.4)

Table 1 — Test schedule for quality conformance inspection, assessment level D

Group B (non-destructive)**To be conducted on a sampling basis, lot-by-lot**

Sub-group	Test						Measurement to be performed		
	Title	a or i.a.	Conditions of test See individual test methods in 4.3 of CECC 96000	IL	AQL		Title	Test detail	Requirements
B1	Operating force	a	13-1 (note 1)	S3	2,5 %		Operating force	13-1 (note 1)	(Note 1)
	Indexing mechanism	i.a.	13-3 (note 1)				Indexing mechanism	13-3 (note 1)	(Note 1)
	Sealing								
	Air leakage	i.a.	14-1 (note 1) Pressure differential Forward — kPa Reverse — kPa				Air leakage	14-1 (note 1)	— cm ³ /h max. leakage
	Water proof (non-immersion)	i.a.	14-2 (note 1)				Insulation resistance	3-1 (notes 1 & 2)	— MΩ min. (as in 2.4)
	Water (immersion proof)	i.a.	14-3 (note 1)				Visual examination Insulation resistance	1-1 (note 1) 3-1 (notes 1 & 2)	No trace of water — MΩ min. (as in
	Flux ingress	i.a.	14-4 (note 1)				(Note 1)	(Note 1)	(Note 1)
	Immersion in cleaning solvent	i.a.	15-1 (note 1)				Visual examination Insulation resistance	1-1 (note 1) 3-1 (notes 1 & 2)	No deterioration — MΩ min. (as in 2.4)
B2	Insulation resistance	a	3-1 (notes 1 & 2)	S3	1 %		Insulation resistance	3-1 (notes 1 & 2)	— MΩ min. (as in 2.4)
	Voltage proof	a	4-1 (notes 1 & 2)				Voltage proof	4-1 (notes 1 & 2)	No breakdown or flashover

Table 1 — Test schedule for quality conformance inspection, assessment level D

Group C (destructive)
To be conducted on a periodic basis

Sub-group	Test						Measurement to be performed		
	Title	a or i.a.	Conditions of test See individual test methods in 4.3 of CECC 96000	p	n	c	Title	Test detail	Requirements
C1	Robustness of terminations	a	8-3 (notes 1 & 2)	6	6	1	Visual examination	1-1 (note 1)	No damage
	Solderability	i.a.	Either 12-1 (notes 1 & 2) <u>or</u> 12-2 (notes 1 & 2) (to be specified)				Visual examination	1-1 (note 1)	As in 12-1 <u>or</u> 12.2 as appropriate
	De-wetting	i.a.	12-3 (notes 1 & 2)				Visual examination	1-1 (note 1)	As in 12-3
	Resistance to soldering	i.a.	<u>Either</u> 12-4 (notes 1 & 2) <u>or</u> 12-5 (notes 1 & 2) (to be specified)				Visual examination	1-1 (note 1)	No damage
	Electrical overload	a	<u>Either</u> 10-1 (notes 1 & 2) only; separate switches to be tested at: a) — V — mA d.c. 3 specimens				Visual examination Contact resistance	1-1 (note 1) <u>Either</u> 2-1 (notes 1 & 2) <u>or</u> 2-2 (notes 1 & 2) (to be specified)	No damage — mΩ (as in 2.4)
							Functional operation	1-7 (note 1)	As in 1-7
							Insulation resistance	3-1 (notes 1 & 2)	— MΩ min. (as in 2.4)

Table 1 — Test schedule for quality conformance inspection, assessment level D

Group C (destructive)**To be conducted on a periodic basis**

Sub-group	Test						Measurement to be performed		
	Title	a or i.a.	Conditions of test See individual test methods in 4.3 of CECC 96000	p	n	c	Title	Test detail	Requirements
C1			b) — V — mA a.c. r.m.s. 3 specimens <u>or 10.1 & 10.2</u> (notes 1 & 2) separate switches to be tested at: c) — V — mA d.c. 2 specimens d) — V — mA a.c. r.m.s. 2 specimens e) Capacitive 2 specimens				Voltage proof	4-1 (notes 1 & 2)	No breakdown or flashover

Table 1 — Test schedule for quality conformance inspection, assessment level D

Group D (destructive)
To be conducted on a periodic basis

Sub-group	Test						Measurement to be performed		
	Title	a or i.a.	Conditions of test See individual test methods in 4.3 of CECC 96000	p	n	c	Title	Test detail	Requirements
D1	Detailed dimensions	a	1-5 (note 1)	12	6	1	Detailed dimensions	1-5 (note 1)	As in 1-5
	Illumination	i.a.							
	Chromaticity	i.a.	18-1 (note 1)				Chromaticity	18-1 (note 1)	As in 18-1
	Transmittancy	i.a.	18-2 (note 1)				Transmittancy	18-2 (note 1)	As in 18-2
	Illuminated surface temperature	i.a.	18-3 (note 1)				Illuminated surface temperature	Max. illuminator power — W	— °C max. rise
	Impact on actuator	a.	7-1 (note 1)				Visual examination Functional operation	1-1 (note 1) 1-7 (note 1)	No damage As in 1-7
	Robustness of actuator	a.	8-1 (note 1)				Visual examination Functional operation Sealing	1-1 (note 1) 1-7 (note 1)	No damage As in 1-7
							Air leakage (i.a.)	14-1 (note 1) Pressure differential Forward — kPa Reverse — kPa	— cm ³ /h max. leakage