

European Committee for Electrotechnical Standardization (CENELEC)
Cenelec Electronic Components Committee

CECC



Système Harmonisé d'Assurance de la Qualité
des Composants Electroniques

SPECIFICATION PARTICULIERE CADRE:

POTENTIOMETRES DE FORTE DISSIPATION

(Niveau d'assurance de qualité M)

Harmonized System of Quality Assessment for
Electronic Components

BLANK DETAIL SPECIFICATION:

POWER POTENTIOMETERS

(Assessment level M)

Harmonisiertes Gütebestätigungssystem für
Bauelemente der Elektronik

VORDRUCK FÜR
BAUARTSPEZIFIKATION:

HOCHBELASTBARE POTENTIOMETER

(Gütebestätigungsstufe M)

1 Edition
Issue
Ausgabe

CECC 41202

1978



Documents

Document Sharing Hub

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 document has been formally approved by the CECC, and has been prepared for those member countries taking part in the System who wish to issue national harmonized specifications for POWER POTENTIOMETERS (Assessment level M). It should be read in conjunction with document CECC 00 100 : Basic Rules (1974).

At the date of printing of this document the member countries of the CECC are Belgium, Denmark, Germany, France, Ireland, Italy, the Netherlands, Norway, Sweden, Switzerland, the United Kingdom, and copies of it can be obtained from the National Committees of the CENELEC in these countries.

PREFACE

This blank detail specification was prepared by CECC Working Group 4 : "Resistors".

In accordance with the requirements of document CECC 00 100 it is based, wherever possible, on the Recommendations of the International Electrotechnical Commission and in particular on IEC Publication 393-1: Potentiometers. Part 1: Terms and methods of test.

The text of this blank detail specification was circulated to the CECC for voting in the documents listed below and was ratified by the CECC for printing as a CECC Specification.

<u>Document</u>	<u>Voting date</u>
CECC(Secretariat)434	27 February 1976
CECC(Secretariat)442	27 February 1976
CECC(Secretariat)560	10 January 1977

KEY FOR PAGE 3

The numbers between square brackets on page 3 correspond to the following indications which should be given :

Identification of the harmonized detail specification

- [1] The name of the National Standards Organization under whose authority the detail specification is drafted
- [2] The CECC Symbol and the number allotted to the national detail specification by the CECC General Secretariat
- [3] The number and issue number of the national generic and sectional specifications
- [4] The national number of the detail specification, date of issue and further information required by the national system, together with any amendment numbers, if issued.

Identification of the potentiometer

- [5] A short description of the type of potentiometer and type number
- [6] Information on typical construction (where applicable) for example: wirewound, single turn rotary
- [7] Outline drawing with main dimensions which are of importance for interchangeability and/or reference to the national or international documents for outlines. Alternatively, this drawing may be given in an appendix to the detail specification.
- [8] Application or group of applications covered, or, preferably, the level of quality assessment covered by the detail specification.
- [9] Reference data on the most important properties, to allow comparison between the various resistor types.

[1] Specification available from :—	[2] CECC 41 202 
[3] ELECTRONIC COMPONENTS OF ASSESSED QUALITY IN ACCORDANCE WITH :—	[4]
[7] Outline and dimensions :— (First angle projection) (Where necessary the dimensions may be given in an Appendix to the detail specification). Terminal connections :—	[5] POWER POTENTIOMETERS (Assessment level M)
	[6] [8]

All dimensions in millimetres

[9]

Style	Rated dissipation (W at 70°C)	Dissipation at 20°C (W)	Limiting element voltage (V d.c. or a.c. r.m.s.)	Isolation voltage (V d.c. or a.c. peak)	
				Normal air pressure	Low air pressure

1. RATINGS AND CHARACTERISTICS

Resistance laws

*Resistance range

The range of values available in each law
and in each style is given in the Qualified
Products List.

Standard selection tolerances

± --- %

Climatic category

-/-/-

*The preferred values are those of the E --- series of IEC 63. Where the use
of intermediate values is essential, they should, wherever possible, be chosen
from a series in that document.

See the relevant Qualified Products List for availability of components made
to this specification.

Vibration severity	---- Hz to ---- Hz; 0,75 mm or 98 m/s ² (whichever is the less severe)
Limits of resistance change (a to c) (after 1 000 h electrical endurance test)	± (---- %R+ ---- Ω)
Starting torque	---- mNm to ---- mNm
Limiting slider current	---- mA
Terminal resistance	---- Ω
Residual resistance (where applicable)	---- Ω
Minimum effective resistance (where applicable)	---- Ω

1.1 Derating

The potentiometers covered by this specification are derated according to -----.

2. MARKING

- 2.1 The following marking information, in the order of importance given below, is required :
- (1) Rated resistance
 - (2) Tolerance on rated resistance
 - (3) Resistance law (if other than linear)
 - (4) Detail specification and style
 - (5) Date of acceptance. A nationally approved code may be used.
 - (6) Details of spindle and bush (if not implicit in (4) above). This may be in code form.
 - (7) Manufacturer's name and trade-mark.
- 2.2 The potentiometers shall be clearly marked with (1) and (2) above using, where practicable, one of the coding methods specified in IEC 62, and with as many of the remaining items as is practicable.
- 2.3 The package containing the potentiometer shall be clearly marked with (1) to (7).
- 2.4 Any additional marking shall be so applied that no confusion can arise.

3. RELATED DOCUMENTS

(National Authorized Institutions will complete this section, making reference to any documents, recommendations or specifications directly referred to in their national equivalent of this document).

4. ORDERING INFORMATION

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

- Resistance value and tolerance.
- Resistance law
- Number of the detail specification and style reference.
- Spindle and bush dimensions, if not implicit in the style reference.

5. CERTIFIED TEST RECORDS

National Authorized Institutions shall indicate in this paragraph whether Certified Test Records shall be prepared in accordance with 3.5 of CECC 41 000.

6. DELAYED DELIVERY

The provisions of 3.6 of CECC 41 000 shall apply, except that the Inspection Level shall be reduced to S-2 and the period shall be extended to two years.

7. ADDITIONAL INFORMATION (Not for inspection purposes)

The detail specification may include information (which is not required to be verified by the inspection procedure), such as circuit diagrams, curves, drawings and notes needed for the clarification of the detail specification.

The resolution shall also be given.

8. INSPECTION REQUIREMENTS (See Table 2)

8.1 When drying is called for, Procedure I of 4.2 of CECC 41 000 shall be used.

8.2 When it is desired to obtain qualification approval by adopting the fixed sample size procedure, use shall be made of the test schedule given for that purpose in CECC 41 200.

The conditions of test and the performance requirements shall be identical to those prescribed for quality conformance inspection in the detail specification.

8.3 In the quality conformance inspection the values representative of the whole approved range shall be tested within one year (Groups A, B and C only).

TABLE 2 (continued)

Test (See Note 1)	D or ND	Conditions of Test	Sample size & criterion of acceptability (See Note 3)			Performance Requirements (See Note 1)
			P	n	c	
<u>GROUP C INSPECTION</u>						
To be conducted on a sampling basis, at the periodicity given in column "P"						
<u>Sub-Group C1</u>	D		3	5	1	
4.3.3 Dimensions (gauging)						As specified in the detail specification
4.16 Starting torque		Room temperature				--- mNm to --- mNm
4.21 Robustness of terminations		The tests appropriate to the type of termination. Visual examination Element resistance				As in 4.21.8 (1) $\Delta R: \leq \pm (---\%R + ---\Omega)$
<u>Sub-Group C2</u>	D		6	8	1	
4.32.1 Electrical endurance at room temperature		See D2.2 Duration : 1 000 h Examination at 168, 500 and 1 000 h Visual examination Element resistance Examination at 1 000 h Insulation resistance (Insulated styles only)				As in 4.32.1.6 (1) $\Delta R: \leq \pm (---\%R + ---\Omega)$ $\geq 10\Omega$
<u>Sub-Group C3</u>	D		12	5	1	
4.30 Mechanical endurance (potentiometers)		Number of cycles : 5 000 Rate : 5 to 10 cycles per minute or a maximum 80 mm/s travel of the moving contact Visual examination Element resistance Starting torque Continuity				As in 4.30.6 $\Delta R: \leq \pm (---\%R + ---\Omega)$ --- mNm to --- mNm As in 4.4.1

Notes on page 12

7 -

CECC 41 202 Issue 1

TABLE 2 (continued)

Test (See Note 1)	D or ND	Conditions of Test	Sample size & criterion of acceptability (See Note 3)			Performance Requirements (See Note 1)
			P	n	c	
<u>Sub-Group C4</u>	ND		12	5	1	
4.19 Locking torque (where applicable)		Visual examination				$\Delta \frac{V_{ab}}{V_{ac}} : \leq \text{---} \%$
4.18 End-stop torque		Visual examination				As in 4.19.3 As in 4.18.1
4.20 Thrust and pull on the spindle		- <u>Two specimens</u> As specified in 4.20.2 Continuity				As in 4.20.2
		- <u>Two specimens</u> As specified in 4.20.3				$\Delta \frac{V_{ab}}{V_{ac}} : \leq \text{---} \%$
		- <u>One specimen</u> As specified in 4.20.4 Visual examination				As in 4.20.4
<u>GROUP D INSPECTION</u>						
To be conducted on a sampling basis, at the periodicity given in column "P"						
<u>Sub-Group D1</u>	D		12	5	1	
4.29 Damp heat, steady state		Where potentiometers are designed to be mounted directly on to a metal chassis 4.29.2.1 shall apply. The first group shall contain one specimen and the second and third groups, two specimens in each. For all other potentiometers 4.29.2.2 shall apply. The first group shall contain two specimens and the second group three specimens. See Note 7 See Note 7				As in 4.29.4
- d.c. load - isolation voltage		<u>Final measurements</u> Visual examination Element resistance				As in 4.29.6.1 $\Delta R : \leq \pm (\text{---} \% R + \text{---} \Omega)$

TABLE 2 (continued)

Test (See Note 1)	D or ND	Conditions of Test	Sample size & criterion of acceptability (See Note 3)			Performance Requirements (See Note 1)
			P	n	c	
		Insulation resistance (Insulated styles only) Starting torque Voltage proof (Insulated styles only)				$\geq 100 \text{ M}\Omega$ --- mNm to ---mNm As in 4.29.6.8
<u>Sub-Group D2</u>	ND		12	5	1	
4.3.4 Dimensions (detail)						As specified in the detail specification
4.3.5 Total mechanical travel						As specified in the detail specification
4.8 Mechanical and electrical travel		Angle of ineffective mechanical travel (anti-clockwise) Angle of ineffective mechanical travel (clockwise) Angle of effective electrical travel				$\leq \text{---}^\circ$ $\leq \text{---}^\circ$ $\geq \text{---}^\circ$
4.6 Terminal resistance		Resistance <u>a</u> to <u>b</u> Resistance <u>b</u> to <u>c</u>				$\leq \text{---} \Omega$ $\leq \text{---} \Omega$
<u>Sub-Group D3</u>	D		24	8	2	
(1) <u>4 specimens</u>					See Note 8	
4.23.2 Soldering - Resistance to heat		Test T of IEC 68-2-20 Soldering iron - Size A Temperature : $350 \pm 10^\circ\text{C}$ Duration : 10 s Element resistance				$\Delta R: \leq \pm (\text{---} \cancel{R} \text{---} \Omega)$
(2) <u>Remaining 4 specimens</u>						
4.24 Change of temperature		See Note 4 T_A : Lower category temperature T_B : Upper category temperature				

Notes on page 12

- 9 -

CECC 41 202 Issue 1

TABLE 2 (continued)

Test (See Note 1)	D or ND	Conditions of Test	Sample size & criterion of acceptability (See Note 3)			Performance Requirements (See Note 1)
			P	n	c	
4.25 Vibration		Duration of extremes of temperature : 30 min Rated dissipation ≤ 100 W Test Na of IEC 68-2-14 Rated dissipation > 100 W Test Nb of IEC 68-2-14 Rate of change of temperature : $5^{\circ}/\text{min}$ Visual examination Output ratio (preset potentiometers only) Element resistance Procedure : B4 Frequency range : --- Hz to --- Hz Amplitude : 0,75 mm or 98 m/s² (whichever is the less severe) Sweep endurance : Total duration 6 h See Notes 5 and 6 See D2.1 <u>Measurements during test</u> Electrical continuity (As specified in 4.25.4) <u>Final measurements</u> Visual examination Output ratio (preset potentiometers only) Element resistance				As in 4.24.5 $\Delta \frac{V_{ab}}{V_{ac}} : \leq \text{---} \%$ $\Delta R : \leq \pm (\text{---} \% R + \text{---} \Omega)$ There shall be no discontinuity greater than 100 μs As in 4.25.5 $\Delta \frac{V_{ab}}{V_{ac}} : \leq \text{---} \%$ $\Delta R : \leq \pm (\text{---} \% R + \text{---} \Omega)$

NOTE 1 : Paragraph numbers of tests and performance requirements refer to CECC 41 000.

NOTE 2 : Inspection levels and AQL's are selected from IEC 410.

NOTE 3 : In this table :

D = destructive

ND = non-destructive

P = periodicity (in months)

n = sample size

c = acceptance criterion

NOTE 4 : Where applicable, the requirements for preset potentiometers shall also apply.

NOTE 5 : Potentiometers shall be mounted by their normal means, in such a manner that there shall be no parasitic vibration.

NOTE 6 : This test is applicable to 25/-/-, 40/-/-, 55/-/- and 65/-/- potentiometers.

NOTE 7 : The d.c. load test, or the isolation voltage test are alternatives. The detail specification shall indicate which test has been selected.

NOTE 8 : In Sub-Group D3 only one defective is permitted in each of (1) and (2), otherwise there shall be not more than two defectives in the Sub-Group.