

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

CECC



Système Harmonisé d' Assurance de la Qualité
des Composants Electroniques

FEUILLE PARTICULIERE CADRE : TRIODES A CHAUFFAGE INDUSTRIEL

Harmonized System of Quality Assessment for
Electronic Components

BLANK DETAIL SPECIFICATION : INDUSTRIAL HEATING TRIODES

Harmonisiertes Gütebestätigungssystem für
Bauelemente der Elektronik

VORDRUCK FÜR BAUARTSPEZIFIKATION : INDUSTRIEGENERATOR-RÖHREN

CECC 45002

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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 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 prepare and issue detail specifications for TRIODES FOR INDUSTRIAL HEATING APPLICATIONS. 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, Netherlands, Norway, Sweden, Switzerland and 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 14 : "SPACE-CHARGE CONTROLLED TUBES".

It is one of a series of blank detail specifications for space-charge controlled tubes, all relating to the generic specification printed as CECC 45 000.

The text of this specification was circulated to the CECC for voting in document CECC(Secretariat)275 in June 1974 and was formally approved by the CECC for printing as a CECC Specification on 12 February 1975.

GENERAL

1. The basic data detailed in clauses 2 to 5 shall appear in the harmonized detail specification. Appendix A shows the basic layout of the front page of such a specification.

2. Identification of the harmonized detail specification

- 2.1 The name of the National Standards Organization under whose authority the detail specification is drafted
- 2.2 The CECC number of the relevant CECC blank detail specification
- 2.3 The number and issue number of the national generic specification
- 2.4 The national number of the detail specification, date of issue and any other information required by the national system.

3. Identification of the triode

- 3.1 A brief description of the tube, type of cathode, type of heating and method of cooling and tube function
- 3.2 Type designation
- 3.3 Outline drawing giving principal dimensions.

4. Supplementary information

Detail specifications shall include supplementary information, such as:

- 4.1 Marking
- 4.2 Ordering information
- 4.3 Related documents referred to in the detail specification
- 4.4 Requirements for certified test records (where certified test records are considered inappropriate, this shall be clearly indicated by the statement "not applicable")
- 4.5 Structural similarity.

5. Data (not for inspection purposes)

5.1 General and mechanical data

- dimensioned engineering drawing, if possible in accordance with IEC 67.
- mass (weight)
- mounting position and accessories
- cooling requirements
- maximum temperature of the envelope, the seals and the terminations.

5.2 Electrical data - Nominal values

- capacitances
- amplification factor
- mutual conductance at stated anode current
(e.g. at instantaneous peak anode current
2)
- characteristic curves
 - 1) Anode current and grid current as a function of anode voltage for stated values of grid voltage
 - 2) Grid voltage as a function of anode voltage for stated values of anode current and grid current
 - 3) Power dissipation as a function of flow for various coolant inlet conditions (when relevant).
- operating conditions
 - 1) Below recommended highest operating frequency
 - 2) At recommended highest operating frequency
 - 3) Reduction of filament voltage for operation at high frequencies (when relevant).

5.3 Electrical data - Limiting values

- limiting values. Absolute maximum rating system in accordance with IEC 134.
 - 1) Minimum warm-up time
 - 2) Maximum filament surge current
 - 3) Limiting value of the filament current for nominal value of filament voltage.
 - 4) Maximum grid external resistance.
- limiting value at stated frequencies. Absolute maximum rating system in accordance with IEC 134.
 - 1) Operating tolerances of filament voltage
 - 2) Maximum anode voltage d.c. or peak a.c.
 - 3) Maximum negative grid voltage d.c. or peak a.c.
 - 4) Maximum anode power dissipation
 - 5) Maximum total grid power dissipation (the actual grid dissipation can be much higher than the apparent value given by peak positive grid voltage x mean grid current)
 - 6) Maximum mean grid current
 - 7) Maximum mean anode current
 - 8) Maximum peak cathode current.

6. Test schedule and performance requirements

The harmonized detail specification shall contain the following groups of tests indicated in the layout shown below:

GROUP A INSPECTION (lot-by-lot)						
Examination or Test	D ND	Conditions of Test (Refer to CECC 45 000)	I L	A Q L	Performance Requirements (Refer to CECC 45 000)	
<u>Sub-Group A0</u>						
Visual examination	ND	as in 4.3	100%		max	
Negative grid current	ND	as in 4.5.2	100%			
<u>Sub-Group A1</u>						
Filament or heater current or voltage	ND	as in 4.5.1	II	1%	min/ max	
Grid voltage at stated anode voltage and anode current	ND	as in 4.5.3	II	1%	min/ max	
Pulse emission	ND	as in 4.4.7	II	1%	min	
<u>Sub-Group A2</u>						
R.F. power output at stated conditions	ND	as in 4.5.15	I	1%	min	
<u>Sub-Group A3</u>						
Dimensions for inter- changeability	ND	as in 4.4	I	2,5%		as in 4.4
Grid emission	ND	as in 4.5.8	I	2,5%	max	

GROUP C INSPECTION (periodic-six months intervals)						
Examination or Test	D ND	Conditions of Test (refer to CECC 45 000)	I L	A Q L	Performance Requirements (Refer to CECC 45 000)	
- Detailed dimensions for control purposes	ND	as in 4.4	S-3	6,5%		as in 4.4
- Capacitances	ND	as in 4.5.14	S-3	6,5%	min/ max	

GROUP D INSPECTION (for qualification approval, to be specified in the detail specification)				
Examination or Test	D ND	Conditions of Test (Refer to CECC 45 000)	Sample size and criterion of acceptance	Performance requirements (Refer to CECC 45 000)
- Robustness of terminations	D	as in 4.6.1		
- Endurance	D	as in 4.7		

Notes

- for the definition of Inspection Groups, see document CECC 00 111.
- D: destructive test
- ND: non destructive test

7. Delayed delivery

Each tube held for a period exceeding twelve months following quality conformance inspection shall be re-examined before delivery by the following tests:

- negative control grid current
- pulse emission.

Appendix A

Layout for the harmonized detail specification

(1)	page of pages	(2) 
(3) Electronic component of assessed quality in accordance with	(7)	(4)
(5) Detail specification for		(6)

Note

References for the above numbers are as follows:

- (1) see 2.1
- (2) see 2.2
- (3) see 2.3
- (4) see 2.4
- (5) see 3.1
- (6) see 3.2
- (7) see 3.3