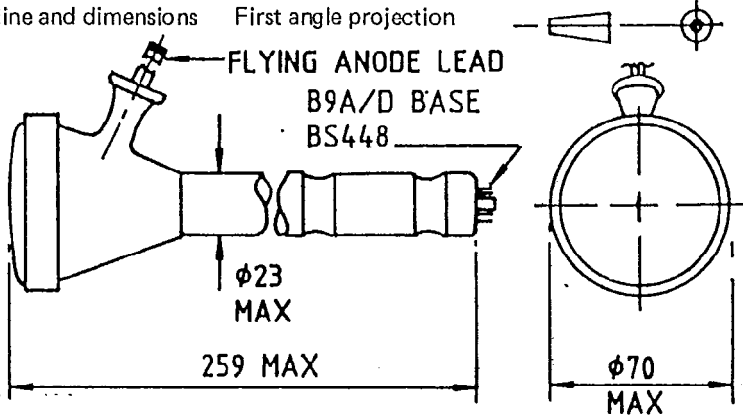


BRITISH STANDARDS INSTITUTION 2, PARK STREET, LONDON, W1A 2BS	BS CECC 11001-001 ISSUE 1 DECEMBER 1983 Page 1 of 18 pages
Specification available from:- AS SHOWN IN PD9002, CECC 00 200, AND THE GEC ELECTRONIC TUBE COMPANY LIMITED THE M-O VALVE COMPANY LIMITED BROOK GREEN WORKS, HAMMERSMITH, LONDON W6 7PE Tel: 01-603 3431 Telex: 23435	
ELECTRONIC COMPONENTS OF ASSESSED QUALITY DETAIL SPECIFICATION IN ACCORDANCE WITH BS CECC 11000 Issue 1, 1980	MANUFACTURER'S TYPE NUMBER 769 H see PD9002 and CECC 00200
Outline and dimensions First angle projection  Dimensions in mm For detail dimensions and base connections see Fig. 1 Marking information see clause 5	For ordering information see clause 6 RADAR DISPLAY PROJECTION CATHODE RAY TUBE DEFLECTION : MAGNETIC FOCUS : MAGNETIC USEFUL SCREEN : 55 mm dia. DEFLECTION ANGLE : 35° (NOM) COLOUR OF DISPLAY : ORANGE PERSISTENCE : LONG EXTERNAL CONDUCTIVE COATING. LOCATION BY SILICONE RUBBER MOULDED FRONT END AND PRECISION GROUND NECK FULL ASSESSMENT PLUS ADDITIONAL ASSESSMENT

DATA (not for inspection purposes)
1. Mechanical

Mounting position	Unrestricted
Mass (weight)	0.32 kg nom.

2. Environmental

		Min	Max	Unit
Vibration:	Acceleration	—	25	m/s ²
	Frequency range	25	500	Hz
Temperature:	Operating	-40	+70	°C
	Storage	-40	+90	°C

Refer to Qualified Products List PD9002 and/or CECC 00200 for details of manufacturers approved to this specification.

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3. Limiting values (absolute maximum rating system – IEC 134)

	Min	Max	Units
Heater voltage	5.7	7.0	V
Heater-cathode, positive voltage	—	90	V
negative voltage	—	300	V
Intensity modulator electrode negative voltage	1	200	V
Intensity modulator electrode positive voltage	Intensity modulator must never become positive		
Final anode voltage	15	35	kV
Cathode mean current	—	50	μ A
Intensity modulator electrode/cathode circuit resistance	—	1	M Ω

4. Operating conditions and typical characteristics (not for inspection purposes)

When the tube is operated under the conditions given below, the characteristic values which follow them are attainable.

Heater voltage	V_h	6.3	V		
Final anode voltage	V_{g2}	30	kV		
Beam current (peak)		300	μA		
				Min	Max
Heater current	I_h			0.275	0.325
Focus requirements				Dependent upon coil used.	
Intensity modulator voltage for spot cut-off	$-V_{g1}$			50	100
Useful screen dimensions				55 dia	
					mm

Resolution (line width measured to 50 % level) will be typically 0.07 mm.

All voltages with respect to cathode.

5. Marking

The following shall be clearly and durably marked on the tube and primary pack.

- (1) Manufacturer's type number.
- (2) Manufacturer's factory identification code.
- (3) Date code.
- (4) BS CECC 11001-001
- (5) NATO stock number (if applicable).
- (6) Manufacturer's serial number.

Special marking relating to hazards: A warning concerning handling, implosion and X-rays will be included with each tube/package.

6. Ordering information

Orders for components to this specification shall include the following minimum information:-

- (1) Quantity.
- (2) Manufacturer's type number.
- (3) CECC 11001-001 Issue 1 December 1983

Any special requirements (eg marking with the NATO Stock No.) and packaging instructions shall be included in the order.

7. Related documents

BS 448	IEC 67	Dimensions of electronic tubes and valves.
BS 2011	IEC 68	Basic environmental testing procedures.
BS 6001	IEC 410	Sampling plans and procedures for inspection by attributes.
BS CECC 11000		Generic specification : Cathode ray tubes.
BS E9000		General requirements for electronic components of assessed quality harmonised with CENELEC Electronic Component Committee System.
CECC 00 200		Qualified Products List.

IEC 100	Methods of measurement of direct interelectrode capacitances of electronic tubes and valves.
IEC 134	Rating systems for electronic tubes and valves and analogous semiconductor devices.
PD 9002	BS 9000 component selection guide.

8. X-radiation

When this tube is operated at voltages in excess of 16 kV, X-ray radiation can be produced which after prolonged exposure, may constitute a health hazard if not adequately shielded.

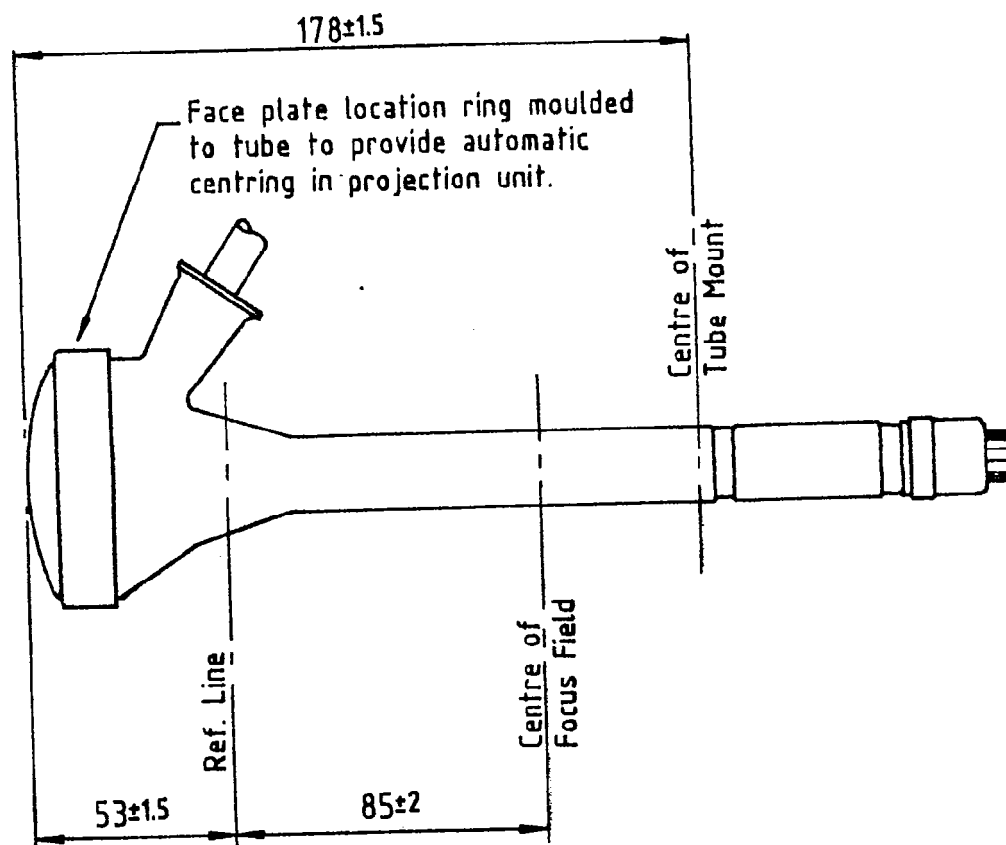
9. Additional information (not for inspection purposes)

- 9.1 The tube should be operated at its minimum useful brightness in order to prevent damage to the screen material. There is a possibility of a rapid burn on the screen if the spot is allowed to remain stationary.
- 9.2 Under no circumstances is the base socket to be used to support the tube. The tube mounting should ensure that the main support is near the faceplate and so arranged that no stresses exist between the glass envelope and neck.
- 9.3 The tube should be shielded from magnetic fields which can be detrimental to its performance.
- 9.4 The tube is expected by the manufacturer to have a minimum shelf life of one year from the date of delivery.
- 9.5 The precautions taken in manufacture reduce the possibility of spontaneous implosion to a minimum, but any additional stress due to mishandling considerably increases the risk of implosion. Such implosion may occur immediately or may be delayed. Particular care should be taken not to scratch any part of the tube envelope, especially the faceplate and the area where the faceplate and side walls meet, as this will appreciably weaken the glass.
- 9.6 For tube and circuit protection, the spark trap, (pins 3 and 7 on base) should be connected to cathode potential.
- 9.7 A silicone rubber ring moulded to front end of tube together with a precision ground section of the neck provide automatic centring in a projection unit.
- 9.8 The faceplate has an internal radius of 104.5 ± 0.75 mm. The glass faceplate thickness is 2.75 mm maximum. The difference between the maximum and minimum thickness of the faceplate over the useful screen area is less than 0.046 mm.
- 9.9 The eccentricity of the glass faceplate is less than 0.5 mm with respect to the centre of the neck bore.
- 9.10 The axis of the tube is the line joining the centres of the rear location band and the faceplate location ring.
- 9.11 Centre of faceplate radius shall be within 0.057 mm of the tube axis.
- 9.12 The EHT lead shall consist of 14/0076 tinned copper wire with silicone rubber insulation 10 mm O/D or an approved equivalent.
- 9.13 The soldered cap at the end of the EHT shall consist of a nominal 10.0 mm O/D, and nominal 4.0 mm deep nickel cap, or an approved equivalent.
- 9.14 An approved moulding compound is:-
 - ICI Silcoset 101
 - Curing agent A, 1 %
 - Silicone fluid F100, 10 %
 - Cured at room temperature

Area of glass to which compound will be applied to be painted with Silcoset primer.
- 9.15 The area to which conductive coating has been applied must be varnished, except for the rear location and contact bands. (A suitable varnish is Stirling V130/2).
- 9.16 The minimum radial thickness of the annular rubber ring when measured at diameter 67.5 mm is 0.5 mm.
- 9.17 An approved phosphor is P26 (JEDEC), LC (Pro-electron).
- 9.18 The external conductive coating should be connected to chassis, the capacitance of this coating to the final anode, typical value 350 pF may be used to provide smoothing for the EHT supply.

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9.19 Recommended position of focus coil and tube mount.



Dimensions in mm.

TEST CONDITIONS AND INSPECTION REQUIREMENTS

GROUP A (Lot by Lot)

General test conditions (unless stated otherwise for particular tests)

Heater voltage V_h	Spark trap voltage	Final anode voltage V_{g2}	Modulator voltage V_{g1}
6.3 V	0 V	30 kV	Adjust as required

Focus and deflection coil assembly : M-0V drawing No. 83-3-024 Iss. 1, or equivalent. (Focus coil connected so that front end of coil is N-magnetic seeking).

Raster details : 405 line TV raster, interlaced.
Field repetition frequency 50 Hz.
55 x 55 mm.
It must be possible to overscan.

All potentials are defined with respect to the cathode unless otherwise stated.

In all cases where instructions read 'focus', adjust focus control for optimum focus. Astigmatism correction is not applied.

All tests are non-destructive.

AQL: given in %

Pre-heating : Apply V_h only, 6.3 V for 60 s minimum.

Inspection or test	Reference CECC 11000	Conditions of test	Inspection requirements				
			Min	Max	Units	IL	AQL
<i>Subgroup A1</i>						100 %	
Visual inspection	4.3	No voltages	See 4.3				
Dimensions, major	4.4	See 4.4	See inspection drawing Fig. 1 (Group A)				
Non-operating endurance	4.9.1	Duration = 168 hrs min					
<i>Post non-operating endurance tests</i>							
Gas content coefficient	4.6.1	$V_{g2} = -40\text{ V}$ Spark trap = 200 V $I_k = 400\text{ }\mu\text{A}$, $V_h = 7.0\text{ V}$ Measure I_{g2}		2.5×10^{-4}	ratio		
Intensity modulator electrode cut-off voltage	4.6.2		50 record	100	V		
Cathode emission	4.6.3	Preset V_{g2} to value for spot cut-off with $V_{g1} = -40\text{ V}$ Overscan tube screen with defocused raster Measure I_k at $V_{g1} = 0\text{ V}$	500 ($k=2$)		μA		
Quality of fluorescent screen and faceplate and useful screen area and uniformity of brightness	4.6.10	Adjust V_{g1} for convenient screen luminance. Useful screen area determined using focused overscanned raster. Uniformity of brightness by visual inspection.	See blemish spec Table 1				
			55 dia		mm		
			No significant variation in brightness within useful screen area				

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Subgroup A1 continued

Inspection or test	Reference CECC 11000	Conditions of test	Inspection requirements				
			Min	Max	Units	IL	AQL
Luminance characteristics	4.6.4	Focused raster. Intensity modulator pulsed from cut-off to give a mean luminance of 675 cd/m^2 at centre of screen when measured through a Wratten 22 filter with a photometer, aperture = 40 mm. Pulse duration = 20 ms. PRF = 10 Hz Pulse rise and fall times within 10 % of pulse duration. Droop not greater than 10 % of pulse amplitude. Measure minimum V_{g1} Measure drive voltage	1 — record	— 60	V V		
Mechanical spot displacement (focused)		Appendix 1 Distance of undeflected spot from the tube axis		3	mm		
Unfocused spot diameter	4.6.28	Adjust drive voltage until limiting aperture is defined on the screen. Pulse duration = $20 \mu\text{s}$. PRF = 10 Hz Pulse rise and fall times within 20 % of pulse duration. Droop not greater than 20 % of pulse amplitude.		15	mm		
Resolution	4.6.14.7	Focused line, writing speed = $1.5 \text{ mm}/\mu\text{s}$. Repetition rate = 10–50 Hz. Drive as in luminance characteristics test. Measure at centre of screen. Percentage amplitude at spatial frequency 50 cs/cm.	60		%		
Stray emission	4.6.6	$V_{g2} = 35 \text{ kV}$, switched continuously 5 s on 1 s off. Screen horizontal and uppermost. Duration of tapping 30 s. Observe for further 15 s with no deflection fields.	See 4.6.6				
Flashover	4.6.7 Method A	As in stray emission test.	See 4.6.7				

6.