

MINISTRY OF SUPPLY, R.R.E.

PROCUREMENT EXECUTIVE,  
MINISTRY OF DEFENCE

VALVE ELECTRONIC

CV2469

Specification MOS/CV2469 MOD (PE) CV2469

Issue 1, dated: 14th July 1958

To be read in conjunction with K1001 and BS.448

SECURITY

Specification  
UnclassifiedValve  
Unclassified

← Indicates a change

TYPE OF VALVE:- Cathode Ray TubeTYPE OF DEFLECTION:- MagneticTYPE OF FOCUS:- ElectrostaticBULB:- Glass, internally coated  
with conductive coating.SCREEN:- Willemitte, aluminium-backed  
Gr 2 (P31) phosphorPROTOTYPE VCRX 407MARKING

See K1001/4

SIDE CONTACT

BS.448. CT.7

BASEBS.448. B12A  
With metal shellRATING

Note

Heater Voltage	(V)	6.3	
Heater Current	(A)	0.6	A
Max a2 and a4 Voltage	(kV)	13	B
Min. a2 and a4 Voltage	(kV)	11	
Max. a1 voltage	(V)	350	
Min. a1 voltage	(V)	250	
a3 voltage limits	(V)	± 500	D
Peak Cathode Current	(uA)	250	

TYPICAL OPERATING CONDITIONS

a2 and a4 voltage	(kV)	12
a1 voltage	(V)	300
a3 voltage	(V)	± 200
a3 current	(uA)	15

NOTES

- Heater current may be between 0.3 and 0.6 amps nominal
- Absolute maximum value.
- The tube should operate satisfactorily with either the anode or cathode at earth potential.
- For a given set of operating conditions optimum focus will be obtained for a Va3 swing of 400 volts within the limits of ± 500 volts.
- No deflecting field should extend further into the electron gun region than 103 mm. from the "reference plane", see drawing page 5.

CONNECTIONS

Pin	Electrode
1	h
2	g
3	No pin
4	No pin
5	No pin
6	a3
7	Int. Connection
8	No pin
9	No pin
10	a1
11	k
12	h
Side Contact	a2 and a4

DIMENSIONS

See drawings on Pages 5 and 6

CV2469

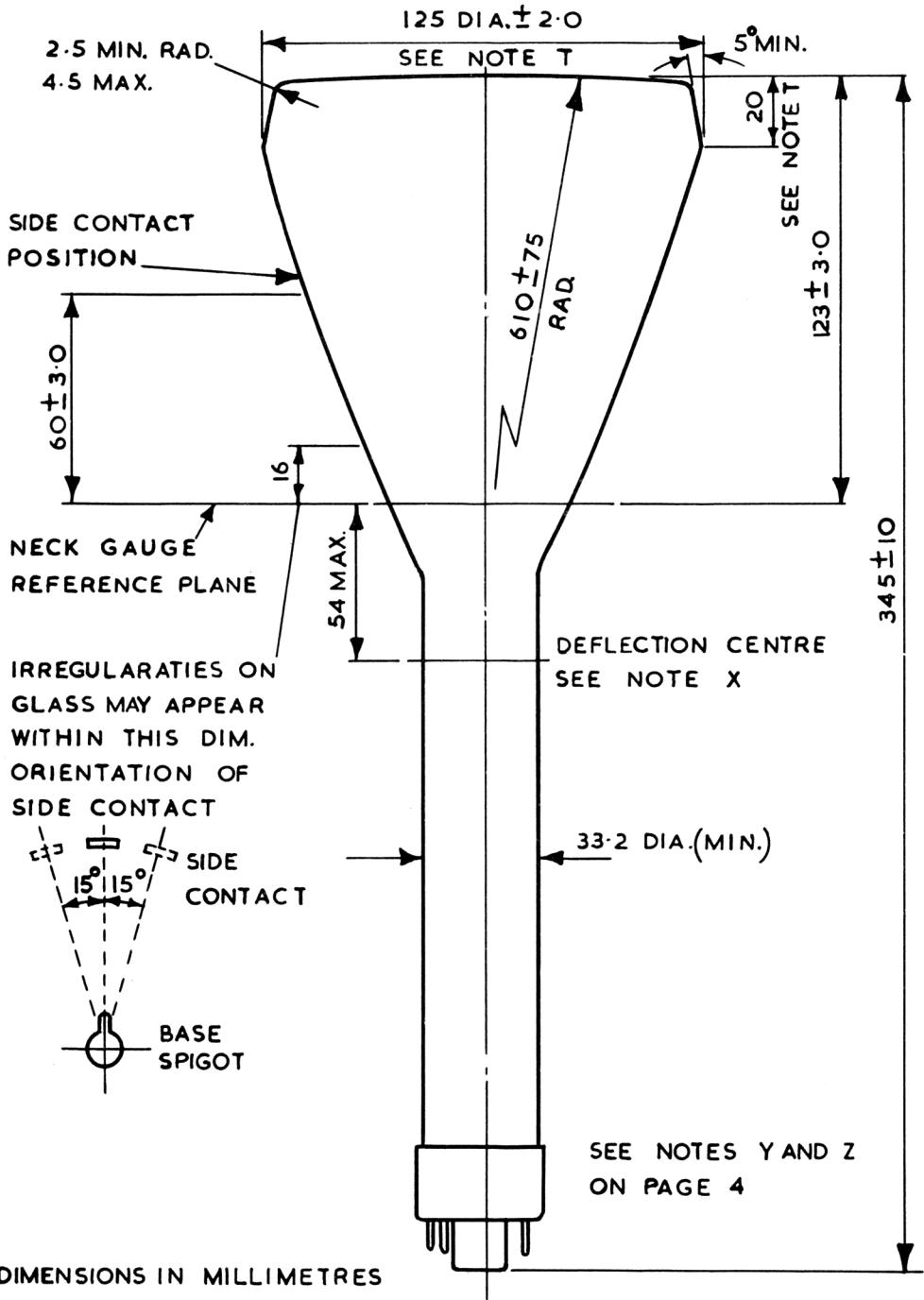
To be performed in addition to those applicable in K1001

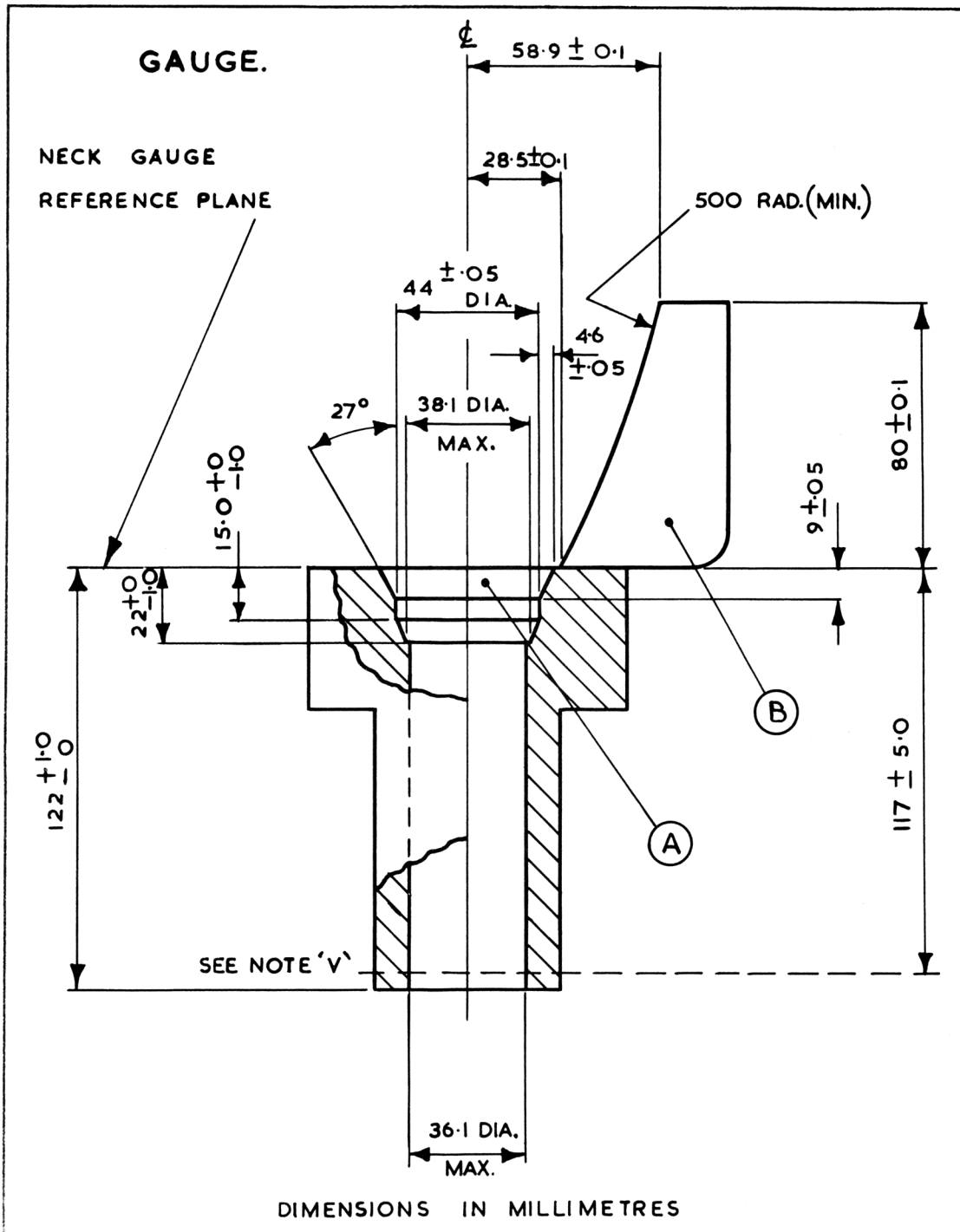
Clause	Test Conditions	Test	Limits		No. Tested
			Min.	Max.	
a	See K1001/5A.13	<u>Capacitances</u> (pf) 1. Grid to all other electrodes 2. Cathode to all other electrodes		12	5% (20)
				12	5% (20)
FOR ALL TESTS GIVEN BELOW $V_h = 6.3$ VOLTS					
b		<u>Heater Current</u> 1. Limits (A) 2. Deviation from manufacturers nominal (%)	0.27	0.66	100%
				$\pm 10$	100%
FOR ALL TESTS GIVEN BELOW, EXCEPT "k", $V_{a1} = 300V$ ; $V_{a2}$ and $V_{a4} = 12$ kv					
c	Adjust $V_{a2}$ for optimum focus and $V_g$ for cut-off see K1001/5A.10.	<u>Grid Base</u> $= V_g$ (V) (Value to be noted)	30	70	100%
d	Using a focussed raster of convenient size adjust $V_g$ to give a light intensity of 2.0 candelas.	<u>Grid Drive</u> Change in $V_g$ from that in test "c" (V)		22 27	100%
e	Adjust $V_{a3}$ for optimum focus at the centre of a linear scan in two directions at right angles successively and a scan length of 100 mm. and 100 $\mu s$ duration Grid drive from cut-off with a 100 $\mu s$ pulse at 50 p.p.s repetition and amplitude found in test "d1".	1. <u>Line width</u> , measured at the centre of the trace (mm) 2. $V_{a3}$ (V) 3. $I_{a3}$ ( $\mu A$ )	-200	0.5 +200 15	100% 100% 100%
f	(i) $V_g = -70$ volts <u>OR</u> (ii) See K1001/5A.3.2 Resistor 10 megohm	<u>Grid Insulation</u> (i) Leakage Current ( $\mu A$ ) <u>OR</u> (ii) Increase in voltmeter reading		7	100%
				100%	
g	Adjust $V_{a3}$ for optimum focus and $V_g$ any convenient value. No deflecting field.	Deviation of spot from the geometric centre of the screen. (mm)		7	100%

Clause	Test Conditions	Test	Limits		No. Tested
			Min.	Max.	
h	With deflection to cover the useful screen diameter, using deflection coils positioned with their centre of deflection at least 54 mm. from the reference plane, adjust Va3 for optimum focus with Vg as in test "d".	<u>Useful Screen Area</u> Diameter centred on centre of screen (mm)	105		100%
j	With no deflecting fields modulate the grid from cut-off with a pulse of 2 $\mu$ s duration at any convenient p.r.f. below 25 c/s and amplitude found in test "d", adjust Va3 for optimum focus. Using a photocell, coupled to a suitable monitor, observe the decay curve.	<u>Afterglow</u> Decay time to 10% of initial light intensity (m.secs) (ms)	10 20	26 30	5% (5)
k	Va1 500V Va2 and 4 15kV Vg -150V Preheat cathode at Vh = 6.3V for 10 mins. The tube to be held with the screen horizontal and uppermost. Va3 as found in test "e.2". The tube to be viewed for 10 secs. in a dark box whilst the neck of the tube is tapped with an approved forked rubber covered wooden hammer at 4 taps per second minimum	<u>Flash Over and Stray Emission</u>  Any flash over or stray emission can be ignored during the first 5 secs. when the "beam" shall be deflected off the screen. During the remaining 5 secs., when there shall be no deflecting field, the tube shall be rejected if flashover or stray emission causes visible screen excitation.			100%
l	Defocused raster of any convenient brightness to cover the useful screen area. See note 1.	<u>Blemishes</u> . (Stones, bubbles and screen defects). Above 1.0 mm dia 1.0 mm to 0.5 mm dia Below 0.5 mm dia. ignore Spacing between blemishes (mm)	None 15	6	
<u>NOTES</u>					
1.	If two or more blemishes including those below 0.5 mm are separated by a distance not greater than the maximum dimension of the largest blemish in the group, then the group of blemishes shall be considered as one blemish of dimension equal to the maximum overall dimension of the group.				

DRAWING NOTES

- T. At a distance of 20 mm from the front face the diameter of the tube shall be  $125 \pm 2.0$  mm and nowhere shall the diameter be greater than 127 mm.
- U. The gauge drawing on Page 6 is not a working drawing for the manufacture of a suitable gauge but it is intended only to indicate critical dimensions with tolerances.
- V. At this plane the gauge will include a centring device to align the gauge axis with the neck axis, where the neck axis is the locus of the average radius for an irregular neck. The accuracy of the centring device shall be such that it is capable of repeatedly clamping a truly circular body of nominal neck diameter so that its axis does not deviate from the gauge axis by more than 0.2 mm.
- W. Concentricity of all turning on the neck gauge to be within  $\pm 0.025$  mm.
- X. The "Deflection Centre" is the physical centre of a deflection coil which has a symmetrical axial field.
- Y. When the neck gauge is pushed along the neck of the tube as far as it will go it shall only make contact with the tube over the taper (A) and at the centring device. When the tube is rotated in the gauge through one revolution, minus the irregular glass area permitted for the side contact, whilst mating with the taper (A) of the gauge, the bulb shall not foul against the vane (B). The position of the neck gauge reference plane relative to the tube shall be determined by pushing the gauge along the neck of the tube until it mates with the taper (A).
- Z. The extended neck axis, defined as the axis of the neck gauge (Page 6) must not deviate from the geometric centre of the screen face by more than 2.0 mm at the screen face plane.





SPECIFICATION MOS/CV2469, ISSUE 1, DATED 14.7.58

Amendment No 1

Insert the following manuscript amendments:-

1 Page 1

i SPECIFICATION AUTHORITY

Delete "Ministry of Supply RRE"

Insert "PROCUREMENT EXECUTIVE, MINISTRY OF DEFENCE"

ii SPECIFICATION TITLE

Delete "SPECIFICATION MOS/CV2469"

Insert "SPECIFICATION MOD(PE)CV2469"

iii Screen:-

Delete "Willemote, aluminium backed".

Insert "GG2 (P31) phosphor"

2 Page 2

Test Clause (d)

In the column headed "Limits Max"

Delete "27"

Insert "22"

3 Page 3

Test Clause (j)

In the columns headed:-

i Test

Delete "m secs"

Insert "u secs"

ii "Limits Min"

Delete "10"

Insert "20"

iii "Limits Max"

Delete "26"

Insert "50"

✓ AAS  
29/4/72