

MINISTRY OF SUPPLY ((D.L.R.D.(A))/R.A.E.)

Specification MOSA/CV.407 Issue 3 Dated 4.5.53 To be read in conjunction with K.1001	<u>SECURITY</u>	
	<u>Specification</u> UNCLASSIFIED	<u>Valve</u> UNCLASSIFIED

→ Indicates a change

<b>TYPE OF VALVE</b> - Cathode Ray Tube <b>TYPE OF DEFLECTION</b> - Electrostatic asymmetrical <b>TYPE OF FOCUS</b> - Electrostatic <b>BULB</b> - Internally coated with conductive coating. <b>SCREEN</b> - BEW <b>PROTOTYPE</b> - VORX 221	<u>MARKING</u> See K.1001/4	
	<u>BASE</u> B1ZD	
	<u>CONNECTIONS</u>	
<u>RATING</u>	Pin	Electrode
Heater Voltage (V) 4.0 Heater Current (A) 1.1 Max. Fourth Anode Voltage (kV) 6.0 Max. Third Anode Voltage (kV) 4.0 Max. First Anode Voltage (kV) 2.5	Note A A A	1 G 2 C 3 H 4 H 5 A1 6 A2 7 Internal Coating (Note D) 8 Y2 9 X2 10 A3 11 X1 12 Y1 S.C. A4
<u>TYPICAL OPERATING CONDITIONS</u>		
→ Fourth Anode Voltage (kV) 4.0 → Third Anode Voltage (kV) 2.0 → Second Anode Voltage (V) 150 → First Anode Voltage (kV) 2.0 → X-plate Sensitivity (mm/V) 0.18 → Y-plate Sensitivity (mm/V) 0.24		
	<u>SIDE CONTACT</u> Snap Terminal	
	<u>DIMENSIONS AND CONNECTIONS</u> See Drawing on page 4	

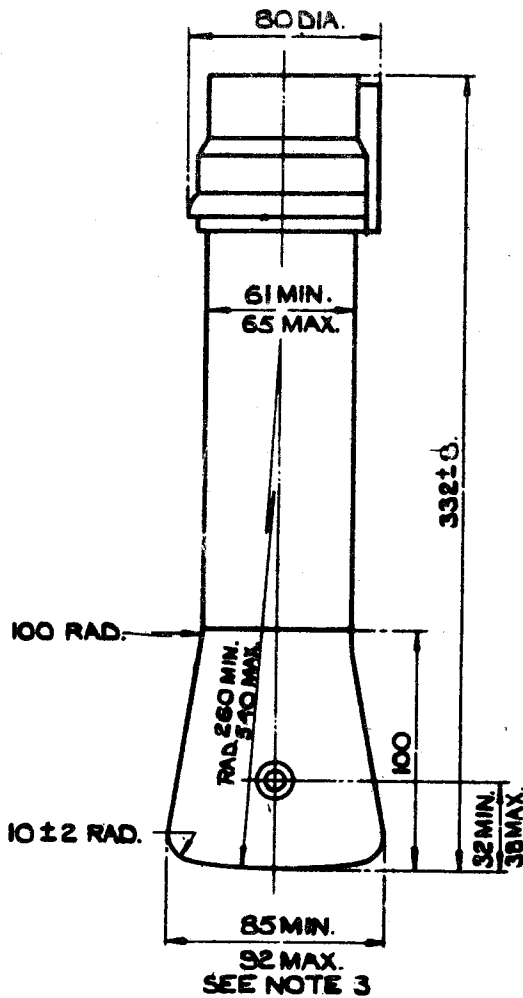
NOTES

- A. The tube shall operate with  $V_{A1} = 2.5$  kV,  $V_{A3} = 3$  kV, and  $V_{A4} = 6$  kV under conditions of reduced pressure equivalent to 6" of mercury at 15°C.
- B. The tube shall be adequately free from microphony.
- C. The tube shall be of the post deflection acceleration type, and the design shall be such that with  $V_{A1} = 2.5$  kV the focus shall be substantially unaffected by varying the value of  $V_{A4}$  to that of  $V_{A3}$ . A change of  $\pm 10\%$  in  $V_{A2}$  shall not produce an appreciable change in cut off voltage.
- D. The tube will normally be operated with A3 and conductive coating tied, and if the manufacturer so desires these electrodes may be strapped internally with the connection omitted from contact marked "internal coating".

To be performed in addition to those applicable in K.1001

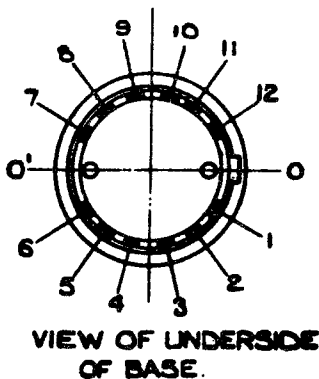
	Test Conditions						Test	Limits		No. Tested	Note	
								Min.	Max.			
a	See K.1001/5A.13.						<u>CAPACITANCES</u> (pF) 1. Each X or Y plate to all other electrodes. 2. One X plate to one Y plate. 3. Grid to all other electrodes.	-	25	5%(10)		
								-	6	5%(10)		
								-	25	5%(10)		
Deflection voltages shall be applied symmetrically in all cases.												
	Vh	Va4 (kV)	Va3 (kV)	Va2	Va1 (kV)	Vg						
b	4	0	0	0	0	0	Ih (A)	0.8	1.3	100%		
c	4	4	2	Adjust for optimum focus.	2	Adjust to cut off	Vg Value to be noted.	-	-100	100%		
d	4	4	2	ditto	2	-	(1) Vg (V)	-1	-	100%		
	Adjust Vg to give 2.5 orthochromatic candelas. Test to be carried out with a sine wave raster of size 3" x 3", and frequencies approximately 50 c/s and 10,000 c/s.							(2) Change in Vg from test (c) (V)	-	35	100%	
e	4	4	2	ditto	2	-	(1) Line width(mm)	-	1.0	100%		
	<u>DEFLECTION</u> with a sine wave time base of 10 kc/s nom. and line length of 66 mm in the X and 70 mm in the Y direction successively the line width to be measured at the centre of the trace. <u>GRID</u> The grid will be pulsed 35 volts positively from cut off with amplitude equal to the value obtained in test d(2), the nominal values of pulse duration and recurrence being 100 µsecs and 100 c/s respectively.						(2) Va2 (V)	50	250	100%		
f	4	4	2	Any convenient Value.	2	-80	<u>GRID INSULATION</u>					
	Recommended method See K.1001/5A.3.2 Resistor = 10 Megohms.							1. Leakage Current (µA)	-	8	100%	
								2. Increase in Voltmeter Reading	-	100%	100%	

	Test Conditions						Test	Limits		No. Tested	Note
	Vh	Va4 (kV)	Va3 (kV)	Va2	Va1 (kV)	Vg		Min.	Max.		
g	4	4	2	Any convenient value	2	Any convenient value	<u>DEFLECTION SENSITIVITIES</u>	0.16	0.20	5%(10)	←
							(1) X-plate (mm/v)				
h	4	4	2	ditto	2	ditto	Deviation of spot from centre of screen (mm)	-	6	100%	
j	4	4	2	ditto	2	ditto	<u>Useful Screen Area</u> 1. Deflections to cover stated rectangle. 2. Deviation of centre of boundary lines of raster from a true rectangle (mm)	-	±2	5%	
k	4	4	2	ditto	2	ditto	1. Orientation of X axis of deflection relative to 00' on drawing.	80°	100°	100%	
							2. Orientation of the diameter through the centre of the snap terminals relative to 00'.	80°	100°	100%	
l	4	4	2	ditto	2	ditto	Angle between X and Y axes of deflection.	88°	92°	100%	
m	4	4	2	ditto	2	ditto	The variation of brightness over any part of the area shall not exceed a 2 : 1 ratio.			100%	



NOTES:

1. THE INTERNAL CONDUCTIVE COATINGS SHALL BE OF SUCH DIMENSIONS THAT THEY FUNCTION EFFECTIVELY BUT DO NOT OBSCURE THE REQUIRED USEFUL SCREEN AREA.
2. WHEN VIEWING THE SCREEN WITH THE TUBE POSITIONED SUCH THAT THE SPIGOT IS UPPERMOST, A POSITIVE VOLTAGE APPLIED TO TERMINAL X<sub>1</sub> SHALL DEFLECT THE SPOT TO THE LEFT, AND A POSITIVE VOLTAGE APPLIED TO TERMINAL Y<sub>1</sub> SHALL DEFLECT THE SPOT UPWARDS.
3. THIS DIA. SHALL INCLUDE ANY PROTRUSION DUE TO SIDE CONTACT.



VIEW OF UNDERSIDE OF BASE.

ALL DIMENSIONS IN MILLIMETRES.