VALVE ELECTRONIC CV 6143

Specification MOA/ CV6143
Issue 1. Dated 1st April 1965
To be read in conjunction with K1001
BS448 and BS1409

SECURITY	
Specification	Valve
Unclassified	Unclassified

Type of valve:-	Cathode Ray Tube
Type of deflection:-	Magnetic
Type of focus:-	Electrostatic
Bulb:-	Glass internally coated with conductive coating.
Screen:-	007 (Aluminium backed)
Prototype:-	8D/03L3M

MARKING

K1001/4

BASE

BS448. B12A

SIDE CONTACT

BS448. CT8.

Absolute Maximum Ratings

(Non-simultaneous and not for Inspection purposes)

			Note
Heater Voltage	(V)	6.3	
Heater Current	(A)	0.3	
Max. Anode 1 Voltage	(V)	500	
Min. Anode 1 Voltage	(V)	200	
Max. Anode 2 + Anode 4 Voltage	(kV)	15	
Min. Anode 2 + Anode 4 Voltage	(kV)	10	
Max. Pos. Anode 3 Voltage	(V)	+500	
Max. Neg. Anode 3 Voltage	(V)	-500	
Max. Vh-k (Heater Pos.)	(V)	150	
Max. Vh-k (Heater Neg.)	(V)	200	

Typical operating conditions

Heater voltage	(V)	6.3	
1st Anode voltage	(V)	300	
2nd and 4th Anode voltage	(kV)	12	
3rd Anode voltage for focus	(V)	±300	A
Vg for visual cut off	(V)	-30 to -90	

CONNECTIONS

Pin	Electrode
1	Heater - h
2	Grid - g
No pin	-
No pin	-
No pin	-
6	Anode 3 - a3
7	No connection
No pin	-
No pin	-
10	Anode 1 - a1
11	Cathode - k
12	Heater - h
Side Contact	Anode 2 + 4

DIMENSIONS

See Drawing Page 6

NOTES

A. The point of optimum focus lies between these values.

B. Screen shall not contain Beryllium.

C. The tube should be operated at its minimum useful brightness in order to prevent damage to the screen material.

D. Nato Stock Number = 5960-99-037-4116

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TESTS

To be performed in addition to these tests applicable in K1001

GENERAL TEST CONDITIONS
(Unless otherwise stated).

Vh (V)	Vg (V)	Va1 (V)
6.3	Adjust	300

K1001 Ref.	Test	Test Conditions	AQL %	Insp. level	Symbol	Limits Min.	Limits Max.	Units
5A.4.6	(a) Capacitances		6.5	IC				
	(1) Grid to all other electrodes					-	8	pF
	(2) Cathode to all other electrodes					-	8	pF
	(b) Heater current			100%	Ih	280	320	mA
5A.4.1.2	(c) Grid Insulation Leakage Current	Vh = 7.0V Vg = -175V Ry = 10Mn		100%	Ig	-	3	µA
5A.4.1.3	(d) Heater Cathode Leakage Current	Vh = 7.0V Resistor = 3 Mohm						
		Vhk = 175V		100%	Ihk	-	30	µA
		Vhk = -450V		100%	Ihk	-	40	µA
5A.4.3	(e) Negative Grid Cut-off Voltage Vg1	Va2+4 = 12kV Adjust Va3 for optimum focus Vg for cut off Note 3		100%	Vg	30 Record	90	V
5A.4.4	(f) Negative Grid Voltage Vg2	Va2+4 = 12kV Ib = 20µA with spot deflected off the useful screen or with raster overscanning useful screen area.		100%		Record Vg2		
	Grid Drive	Vg1 - Vg2			Vg	-	20	V

K1001 Ref.	Test	Test Conditions	AQL %	Insp. level	Sym bol	Limits Min.	Limits Max.	Units
5A.7.2.2	(g) Line width (i) Measured at the centre of the trace	Va2+4 = 9kV Adjust Va3 for optimum focus at the centre of a linear scan in two directions at right angles successively with a scan length of 100 mm. Pulse grid from cut-off to an amplitude found in Test (f) for a duration of 100 µSecs at 50 p.p.s. Note 1.		100%		-	0.6	mm
	(ii) Va3			100%		-300	+300	V
	(h) Astigmatism of undeflected focussed spot	Pulsed spot Pulse width = 0.1 µS p.r.f. = 100 p.p.s. max. mains synchronised. Amplitude Ib = cut-off to 50µA See Note 6		100%		-	30	%
5A.6.4.2	(k) Deviation of spot from geometric centre	Va2+4 = 12kV Adjust Va3 for optimum focus and Vg for any convenient value. No deflecting field. Note 2		100%		-	10	mm
5A.6.3	(l) Useful screen area	Va2+4 = 9kV With deflection to cover the useful screen diameter with Vg set at any convenient value. Va3 for optimum focus.		100%		197	-	mm

K1001 Ref.	TEST	TEST CONDITIONS	AQL %	Insp. Level	Sym-bol	Limits		Units
						Min.	Max.	
5A.5.5	(m) Persistence measured to a decay time of (i) 80% (ii) 15%	Va2+4 = 15kV Vg adjusted to give screen luminance of 2 foot lamberts viewed through a Wratton 22 filter or equivalent. Linear raster of convenient size, uniform screen excitation. Excitation time to be 120 secs.	2.5	I		100 -	400 10	mS Secs
5A.5.1.1	(n) Screen efficiency Measured in terms of Beam current.	Va2+4 = 9kV Vg adjusted to give a light intensity of 0.12 candela using a focussed raster of convenient size.		100%	Ib		12	µA
5A.4.2	(o) Flashover and stray emission	Va2+4 = 18kV Preheat cathode for 2 mins. before applying other potentials. Adjust Vg for cut off and Va3 for value found in Test (g)(ii) Notes 4 and 5.		100%				
5A.4.5	(p) Gas Test measured as ratio $\frac{Ia2}{Ik}$	Va1 = 200V Va2 = -25V Adjusted to give Ik = 400µA min.		100%			2×10^{-4}	

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K1001 Ref.	TEST	TEST CONDITIONS	AQI %	Insp. Level	Sym-bol	Limits Min.	Limits Max.	Units
5A.3.5	(q) Screen Blemishes	With no focus field and a raster of any convenient brightness to cover useful screen area.		100%	Blemishes shall be determined from the diagram on Page 7.			
5A.7.2	(r) Resistance to External Pressure			QA				
5A.3.9 5A.3.9.1 5A.3.9.2 5A.3.9.3	(s) Heater Modulation Cathode Illumination Effects of Magnet-isation			 QA QA QA				
5A.3.7 5A.4.5	(t) Holding Period 7 days. Repeat (p)			 100%			 2×10^{-4}	

NOTES

1. Focus line in X direction, rotate tube and focus line in Y direction, each time measuring Va3 for optimum focus. The mean value of Va3 is the focus voltage.

2. Mark the position of the spot, rotate the tube through 180° and mark the new position of the spot. Midway between the two marks is the electrical centre of the screen. Spot deviation is the distance between the geometrical and electrical centre of the screen.

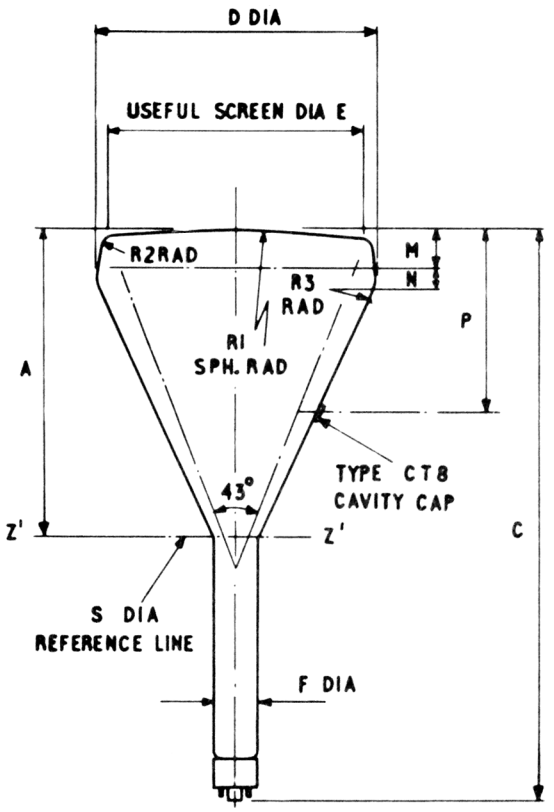
3. In order to avoid spot burns and flashover the tube must be free from stray emission before measuring cutoff, etc.

4. The tube shall be rejected if flashover on stray emission cause visible screen excitation after the first five seconds.

5. The tube shall be held with the screen horizontal and uppermost. It shall be viewed for 10 seconds in a dark box whilst the neck is tapped with an approved forked rubber covered wooden mallet at a minimum rate of 4 taps per second. There shall be no dark lines or bars on the screen.

6. Measure maximum and minimum axis at tube centre. The greater must not exceed the smaller by more than 30%.

OUTLINE DRAWING



ORIGINAL DIMS. IN MM

DIM	MM	IN	DIM	MM	IN
A	240 ± 3	9·45 ± ·12	N	20	·79
C	450 ± 10	17·72 ± ·39	P	144±6	5·67 ± ·24
D	214 ± 2	8·425 ± ·079	RI	850	33·5
E	197 MIN	7·75	R2	5	·20
F	35 $\pm^{\cdot5}_{\cdot0}$	1·378 $\pm^{\cdot020}_{\cdot039}$	R3	25	·98
M	25·4	1	S	36	1·417

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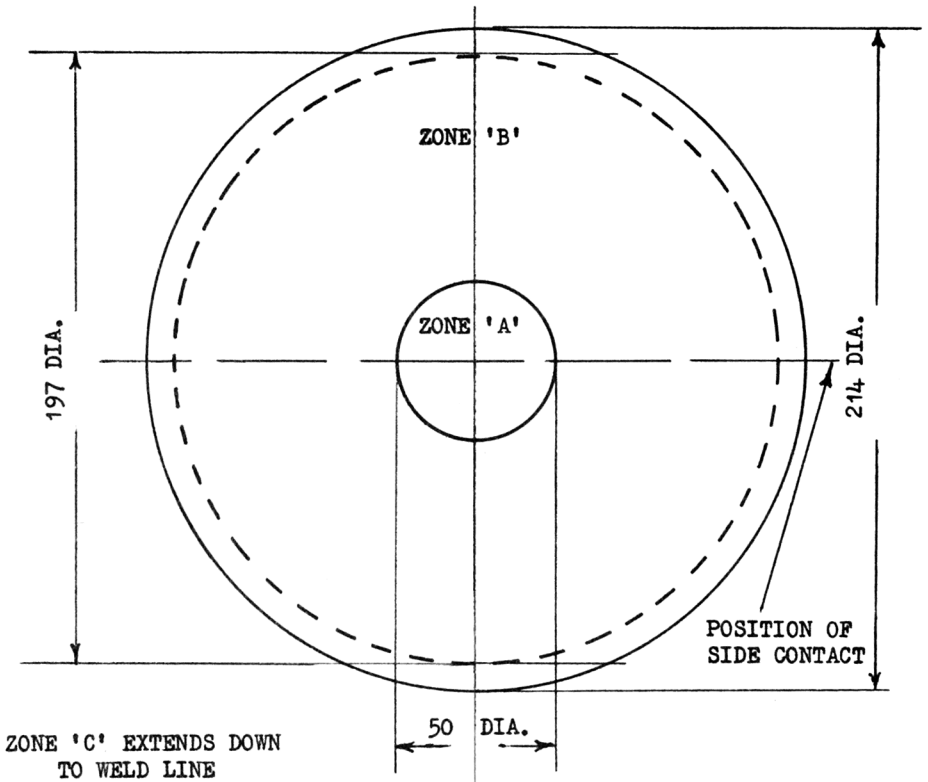
SCREEN INSPECTION DIAGRAM



Dimensions in Millimetres

		Zone A			Zone B		
Bubbles, Black Specs, Inner & Outer Indentations & Bruises	Size	Less than .375	.375 - .5	.5 - .75	Less than .375	.375 - .5	.5 - .75
	No. per size	No Limit		1	No Limit	8	8
	Total No.	No Limit	4		No Limit	16	
	Min. Distance	Ⓐ	10 per pair		Ⓐ	10 per pair	20
		Zones A & B			Zone C		
ELONGATED BUBBLES	Width	Less than .15	.15 - .25	More than .25	ALL BRUISES & CRACKS TO BE REJECTED.		
	Max. Length	No limit	25 total in each zone	See bubbles of same dia.			
		Zones A & B			Zone C		
SCRATCHES	Width	Less than .05	.05 - .10	.10 - .15	NO LIMIT PROVIDED THEY DO NOT IMPAIR STRENGTH		
	Sum Total Length	No Limit	50	13			