Ministry of Technology - DLRD/RRE.

Valve Electronic **CV10488 CV10489**

Specification Mintech./CV10488 and CV10489 Issue 1. Dated September 1967 To be read in conjunction with K1001.	SECURITY Specification: Unclassified Valve: Unclassified

Type of Valve : Cathode Ray Tube with P.D.A.
Deflection : Electrostatic Symetrical
Focus : Electrostatic
Bulb : Glass. Internally spiralised
Screen :
Prototype : CV10488 (BY8 / SE5EM7) CV10489 (GG5 / SE5EM31)

MARKING

See K1001/4

BASE

B12F

RATINGS AND CHARACTERISTICS

Absolute, non simultaneous and not for Inspection purposes. (Note A).

			Note
Max. P.D.A. ratio		12 : 1	
Max. Anode 4 voltage	(V)	15	
Mean plate potential max.	(V)	2	
Max. I.P.S. voltage	(V)	2	
Max. Anode 3 voltage	(V)	2	
Max. Anode 1 and modulator voltage	(V)	2	
Max. Anode 1 to modulator voltage	(V)	500	
Max. Anode 2 voltage	(V)	500	
Max. negative grid voltage	(V)	-300	
Min. negative grid voltage	(V)	-1	
Max. heater/cathode voltage peak	(V)	250	
Max. Anode 3 - X plate voltage	(V)	500	
Max. Anode 3 - Y plate voltage	(V)	500	
Max. Anode 3 - X plate resistance	(Mohms)	3	
Max. Anode 3 - Y plate resistance	(ohms)	100	
Max. Cathode grid resistance	(Mohms)	15	
Max. Anode 2 current	(μA)	4	
Heater current	(A)	.3	
Heater voltage	(V)	6.3	
Minimum spiral resistance	(Mohms)	50	

Typical operation conditions

Anode 1 voltage	(V)	850
Anode 2 voltage	(V)	0 - 150
Anode 3 voltage	(V)	850±50
Anode 4 voltage	(V)	10
X sensitivity	(V/cm)	14
Y sensitivity	(V/cm)	5.4
Available scan	(cms)	10 x 6

CONNECTIONS

Basepins

1	Grid
2	Cathode
3	Heater
4	Heater
5	Anode 2
6	Internal connection
7	Anode 1
8	Anode modulator
9	Anode 3
10	Internal connection
11	Internal connection
12	Internal connection

Sidepins

1	X_2 Deflector plate
2	X_1 Deflector plate
3	Interplate shield
4	Y_1 Deflector plate
5	Y_2 Deflector plate

DIMENSIONS

See page 5.

NOTES

A. All voltages with respect to cathode.

B. NATO Stock Numbers:-

CV10488 - 5960-99-037-5351
CV10489 - 5960-99-037-5352

TESTS

To be performed in addition to those stated in K1001

Test Conditions: Unless otherwise stated

Vh	Val	Vm	Va3	Mean Def. Plate potential	Interplate Shield potential	Va2	Va4	-Vg
(V)	(kV)	(kV)		(kV)	(kV)		(kV)	
6.3	.85	.85	Optimum Astig	.85	Optimum geometry	Optimum focus	10.0	Adjust

K1001 Ref.5A	Test	Test Conditions	AQL	Insp. Level	Symbol	Limits Min.	Limits Max.	Units
3.1	General Inspection	No Voltages See drawing		100%				
3.2	Loose particles			100%				
4.1.1	Insulation			100%				
4.1.2	Grid insulation	Vgk - 100V						
	Leakage current			100%	I_{kg}	-	10	µA
4.1.3	Heater cathode	V_{hk} = ± 100V		100%	I_{hk}	-	50	µA
	Leakage current			100%	Ih	.27	.33	A
4.2.1	Maximum Voltage			100%				
	Flashover							
4.2.2	Stray Emission			100%				
4.3	Negative grid cut off voltage (Vco)			100%	Vg	35	55	V
	Modulator cut off	I_b = 15µA		100%		800	-	V
	Zero bias emission	Vg = 0 Record Ik. Calculate $\frac{Ik}{Vco^{3/2}}$		100%		3	-	
4.3	Negative grid voltage (V_1)	Adjust Vg for beam current of 10µA		100%		Record		

TESTS (Cont'd)

K1001 Ref.5A	Test	Test Conditions	AQL	Insp. Level	Symbol	LIMITS Min.	LIMITS Max.	Units
4.3 (Cont'd)	Grid drive (V_{co}-V_1)					-	27	V
	Spiral current	Vg adjusted for cut off		100%	Is	-	150	µA
	Gas cross	Ib = 15µA 8 x 5 cm. 10kHz x 50Hz raster.		100%			None	
5.1	Light intensity	Ib = 10 µA 6 x 4 cm 10kHz x 50 Hz raster. View through Ilford 41 or 43 filter as appropriate, or equivalent. Light intensity shall increase uniformly with Vg.		100%	CV10488	33	-	ft/L
					CV10489	125	-	ft/L
5.7.1	X Focus	Ib = 5 µA 25 line vertical raster 1250 Hz x 50 Hz 6 cms x 10 cms						
	Line width at centre			100%			.6	mm
	Line width at ± 46 mm from geometric centre.			100%			1.0	mm
	Anode 2 voltage					0	150	V
	Anode 3 voltage					800	900	
6.1	Deflection							
	Sensitivity							
	X plates			100%		15.5		V/cm
	Y plates			100%		5.9		V/cm
	Y linearity	(1) 2 horizontal lines 1 cm either side of geom centre, at low intensity. Measure separation.		100%		1.95	2.05	cm
		(2) Shift lines to ±3 cms. of geometric centre.				Lines to be visible.		

K1001 Ref.5A	Test	Test Conditions	AQL	Insp. Level	Symbol	Limits Min.	Limits Max.	Units
6.2.1	Raster distortion	A nominally rectangular raster shall fit between a 10 x 6 cm and a 10.2 x 6.2 cm rectangle.		100%				
	IPS potential					800	900	V
6.2.2	Angle between X and Y axes			100%		89°	91°	
6.3	Useful screen area							
	X direction			100%		10	—	cm
	Y direction			100%		6	—	cm
6.4.1	Spot position			100%		—	5	mm
	Modulator bright point	Defocussed undeflected spot of low intensity. Adjust Vm for bright spot Measure Vm				842	858	V
	Screen Blemishes, stones, bubbles screen defects.	Defocussed raster covering useful screen area at convenient intensity.						
	Max. size of blemish. No. of blemishes between .2 - .5mm.						.5 8	mm
4.6	Inter-electrode capacitance	No voltages	6.5%	IC				µµF
	Cathode/all				Ck-all		6	"
	Grid/all				Cg-all		7	"
	X_1 X_2				CX_1 X_2		2.0	"
	Y_1 Y_2				CY_1 Y_2		1.8	"
	X_1/all except X_2						5.5	"
	X_2/all " X_1						5.5	"
	Y_1/all " Y_2						4.0	"
	Y_2/all " Y_2						4.0	"
7.2	Resistance to External pressure	No voltages		Q.A.				

TESTS (Cont'd.)

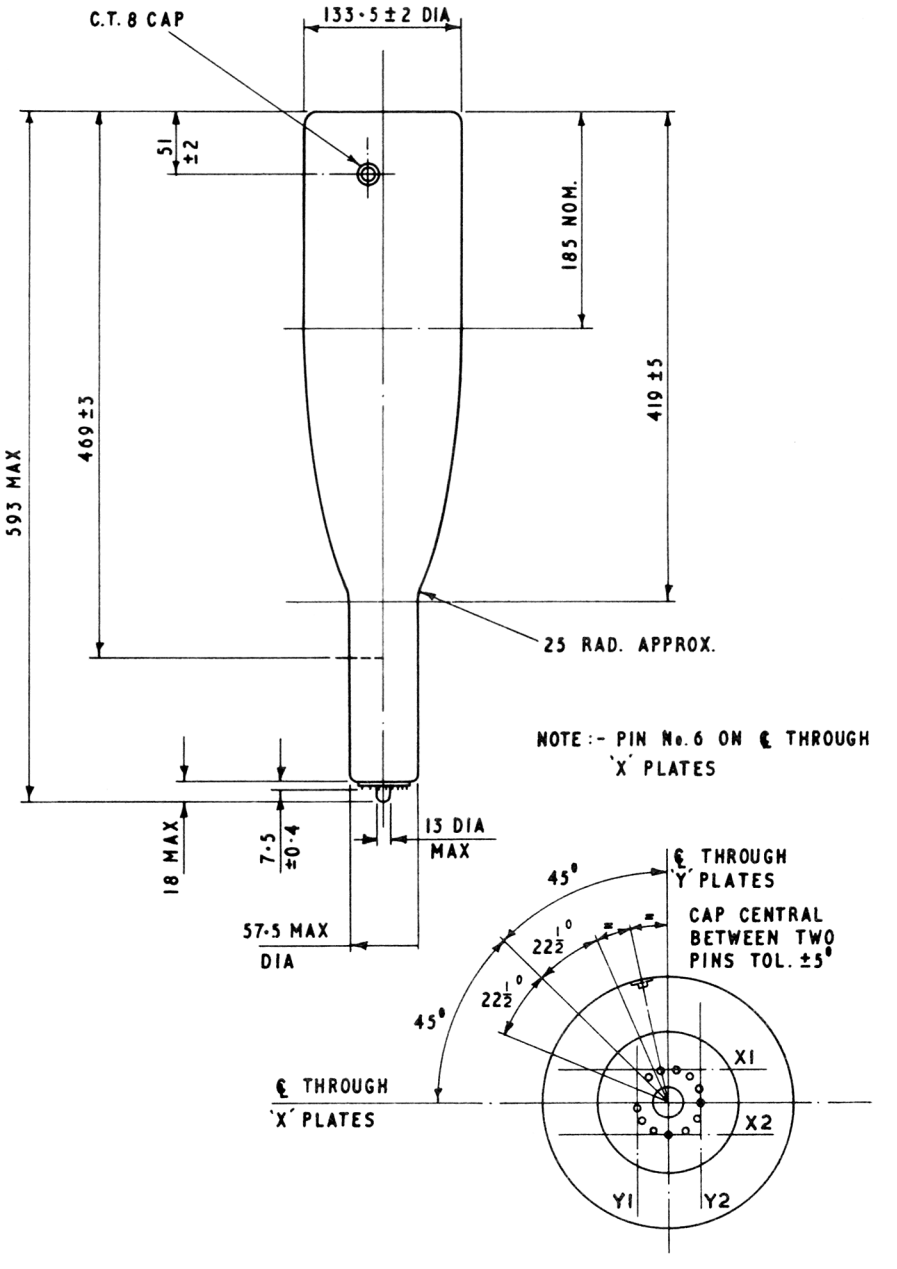
K1001 Ref.5A	Test	Test Conditions	AQL	Insp. Level	Symbol	Limits Min	Limits Max	Units
	Life	Voltages as for initial test conditions. Ib = 15μA. Raster size = 10 cms. x 6 cms..		Note 1				
	End Point (500 hours)	Ik = 500μA			Ib	7.5		μA
	Holding Period (7 days)			100%				
	Gas Cross	Ib = 15μA 8 x 5 cm., 10kHz x 50Hz raster.					None	

NOTES

1. The inspection level shall be based on the production quantities as follows:-

For orders of less than 51, at least one tube shall be life tested. For orders greater than 51 , the production shall be divided into batches of 50, and at least one tube from each shall be life tested. The batch corresponding to the tube undergoing life test shall not be released until the life test has completed 80% of the required life. At the option of the manufacturer and at his expense any number of additional tubes may be life tested, in which case the average of the lives of the tubes shall exceed 80% of the required life before the batch is released. Life test is considered satisfactory when an accumulated total of 500 hours per sample is reached.

OUTLINE DRAWING



ALL DIMENSIONS IN MILLIMETRES