

ELECTRONIC VALVE SPECIFICATION

SPECIFICATION CV.4055

ISSUE 2 - DATED 23rd NOVEMBER, 1956

AMENDMENT No: 2

GROUP F

Intermittent Life Test Point (1000 hrs.)

Electrode Insulation

Delete all reference to Heater Current Test

Add at the end of this Group the following:-

K1001 Ref.	Test	Test Conditions	AQL %	INSP. LEVEL	SYMBOL	LIMITS					
						MIN	LAL	BOGEY	UAL	MAX	UNITS
	ELECTRODE	V _a , all = -300V	6.5	-	R	30	-	-	-	-	MΩ
	INSULATION	V _{g1} , all = -100V			R	30	-	-	-	-	MΩ
		V _{g2} , all = -300V			R	30	-	-	-	-	MΩ

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AMENDMENT NO. 1

PAGE 1.

BASE

AMEND "See B.S. 448: B9A/2.1."

to read "See B.S. 448: B9A/1.1."

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T.V.C. Office

N.87621R

T.V.C.

December, 1957.

Specification MOS/C V 4055 Issue 2 Dated 23. Nov. 56. To be read in conjunction with K1001, BS448 and BS 1409	<u>SECURITY</u>
	Specification Valve Unclassified Unclassified

Indicates a change →

TYPE OF VALVE - Reliable Video Output Pentode		<u>MARKING</u>	
CATHODE	- Indirectly-heated	See K1001/4	
ENVELOPE	- Glass		
PROTOTYPE	- CV2127; 6CH6		
<u>RATINGS</u> All limiting values are absolute		<u>BASE</u>	
Heater Voltage	(V)	6.3	Note
Heater Current	(A)	0.75	
Max Anode Voltage ($I_a = 0$)	(V)	500	
Max Operating Anode Voltage	(V)	300	
Max Screen Grid Voltage ($I_{g2} = 0$)	(V)	500	
Max Operating Screen Voltage	(V)	300	
Max D.C. Cathode Current	(mA)	65	
Max Peak Cathode Current	(mA)	1.5	
Max Grid Circuit Resistance	(Kohms)	100	B
Max Bulb Temperature	(°C)	250	C
Max Shock (Short Duration)	(g)	5.0	
Max Acceleration (continuous operation)	(g)	2.5	
<u>PENTODE CONNECTION</u>		<u>CONNECTIONS</u>	
Max Anode Dissipation	(W)	12	
Max Screen Grid Dissipation	(W)	2.5	
Anode Current	(mA)	40	D
Screen Grid Current	(mA)	6	D
Mutual Conductance	(mA/V)	11	D
Inner Amplification Factor		26	D
<u>TRIODE CONNECTION</u> (g2 to a, g3 to k)		<u>DIMENSIONS</u>	
Max Anode Dissipation	(W)	12.5	
Cathode Current	(mA)	46	D
Mutual Conductance	(mA/V)	13	D
Amplification Factor		26	D
<u>CAPACITANCES</u> (pF) (See Note E)		<u>Dimensions (mm)</u>	
<u>PENTODE CONNECTION</u>		Min.	Max.
Cin (nom)			A. Seated height
Cout (nom)			B. Diameter
Cag1 (max)			D. Overall length
<u>TRIODE CONNECTION</u>			
Cin (nom)		6.0	
Cout (nom)		6.0	
Cag1 (nom)		6.5	
		<u>MOUNTING POSITION</u>	
		Any	

NOTES

- B. This value may be increased to 220k if cathode bias is used.
- C. Caution to Electronic Equipment Design Engineers: Special attention should be given to the temperature of valve to be operated in aircraft. Reliability will be seriously impaired if the maximum bulb temperature is exceeded. The life expectancy may be reduced if conditions other than those specified for life test are imposed on the valve and will be reduced appreciably if absolute maximum ratings are exceeded. Both reliability and performance will be jeopardised if heater voltage ratings are exceeded: life and reliability performance are directly related to the degree that regulation of the heater voltage is maintained at its centre-rated value.

NOTES (cont'd)

- D. Measured at $V_h = V_{g2} = 250V$, $V_{g1} = -4.5V$, $V_{g3} = 0$.
 E. Measured in a fully screened socket; no external shield.

TESTS

To be performed in addition to those applicable in K1001
 and in the specified order unless otherwise agreed with the Inspecting Authority

Test Conditions - unless otherwise specified												
K1001	Test	Test Conditions	AQL	Insp. level	Symbol	Limits					Units	
						Min.	LAL	Bogey	UUL	Max.		
7.1	Glass Strain	No voltages	6.5	I								
	<u>GROUP A</u> Insulation	$V_h, \text{all} = -300V$ $V_{g1}, \text{all} = -100V$ $V_{g2}, \text{all} = -300V$ $R_{g1} = 100K \text{ Max}$	100%	R	100 100 100 -				- - - 1.0	M M M uA		
	Reverse Grid Current	100%	Ig1									
	<u>GROUP B</u> Heater Current Heater-cathode Leakage Current	Combined AQL $V_{hk} = \pm 100V$ $V_{hk} = -100V$ Cathode positive	1.0 0.65 0.65 0.65	II II V2 II	Ih Ihk Ihk Ia	0.69 - - 30	- - - -	0.75 - - -	- - 2 -	0.81 10 -	A uA uA	
	Anode Current		0.65	V2	Ia	-	36.3	40	43.7	- 50	8.2	mA
	Mutual Conductance		0.65	II V2	gm gn	9.0 -	- 10.26	11.0	11.74	- 13.5	1.65	mA/V mA/V
	<u>GROUP C</u> Screen Grid Current	Combined AQL	6.5	I	Ig2	-	-	-	-	7.5		mA
	Anode Current Change in mutual conductance	$V_{g1} = -25V$ $V_h = 5.7V$	2.5 2.5	I I	Ia Ia	- -	- -	6.0 -	6.72 -	- 10		mA
	Reverse Grid Current	$V_h = 6.9V$, $V_a = 300V$ $V_{g2} = 25mV$, $I_a = 40mA$ $R_{g1} = 100K \text{ Max}$ Note 1	2.5	I	Δg_m Ig1	-	-	-	-	- 2.5		uA
11.1	Vibration Noise Output Voltage	$V_a(b) = 250V$ $R_L = 2K$ $R_K = 1.5K$ $C_K = 1.00 \mu F$	2.5	I	$V_a \text{ AC}$	-	-	-	-	75	mV_{RMS}	

RDO	Test	Test Conditions	AQL %	Insp. level	Symbol	Limits						Units
						Min.	LAL	Bogey	UL	Max.	ALD	
11.1	<u>GROUP D</u>											
	Base Strain Capacitance	No voltages Measured on a 1 Mc/s bridge with the valve mounted in a fully screened socket No shield	6.5 6.5	IA IC	C in C out Ca,g1	10.0 4.0 -		12.5 5.0 0.145		15.0 6.0 0.18		pF pF pF
	g3 continuity	Vg3 = 250V Note 2	6.5	IA								
	Inner amplification Factor		6.5	IA	ug1,ug2	20	-	26	-	32	-	
11.2	Peak emission	Vg1 = Vg2 = Va = 70V pulsed half sine wave, tp = 10 uSec max prf = 50 pps	6.5 6.5	IA	IKpk	1.5	-	-	-	-	-	A
	<u>GROUP E</u>											
	Resonance Search (1)	Va(b) = 250V; RL = 2K; frequency range: 25 to 500 c/s		IC								
	Vibration Noise Output Voltage	Note 3	2.5		Va AC	-	-	-	-	-	record	mV rms s7s
11.3	Resonant Frequency		2.5		i	200	-	-	-	-	-	
	Fatigue	Vh = 6.9V switched 1 min on, 3 mins off Vd = Vg2 = 0; Min. pk accel = 5g; Duration = 30, 30, 30 hrs. f = 170 c/s		IA								
	<u>Post Fatigue Tests</u>	Combined AQL..	6.5									
	Heater-cathode Leakage Current	Vhk = ±100V	2.5	:	Ihk	-	-	-	-	-	20	uA
11.1	Reverse Grid Current	Rg1 = 100K MAX.	2.5		Igt	-	-	-	-	-	1.5	uA
	Mutual Conductance		2.5		gm	7.6	-	-	-	-	-	mA/V
	Vibration Noise Output Voltage	Note 3	2.5		Va AC	-	-	-	-	-	100	mV rms
	Shock	No voltages Hemmer angle = 30°		IA								
11.4	<u>Post Shock Tests</u>	Combined AQL..	6.5									
	Heater-cathode Leakage current	Vhk = ±100V	2.5		Ihk	-	-	-	-	-	20	uA
	Reverse Grid Current	Rg1 = 100K MAX	2.5		Igt	-	-	-	-	-	1.5	uA
	Mutual Conductance		2.5		gm	7.6	-	-	-	-	-	mA/V
11.1	Vibration Noise Output Voltage	Note 3	2.5		Va AC	-	-	-	-	-	100	mV rms

KOD	Test	Test Conditions	AQL %	Insp. level	Symbol	Limits					Units
						Min.	LAL	Bogey	UAL	Max.	
	<u>GROUP F</u>										
AVI/5	Life	V _a = 250V V _{g2} = 250V R _k = 100 R _{g1} = 100K Max									
AVI/5.1	<u>Stability Life Test</u>										
AVI/5.3	Change in Mutual Conductance		1.0	I	Δ gn	-	-	-	-	5	%
AVI/5.3	Intermittent Life Test										
AVI/5.6	<u>Life Test End-point (500 hours)</u>	Combined AQL	6.5	IA							
AVI/5.6	Inoperatives		2.5								
AVI/5.6	Heater Current		2.5								
AVI/5.6	Heater-cathode Leakage Current	V _{hk} = ±100V	2.5		I _{hk}	-	-	-	-	15	mA
AVI/5.6	Reverse Grid Current	R _{g1} = 100K Max	2.5		I _{g1}	-	-	-	-	1.5	mA
AVI/5.6	Mutual Conductance		2.5		gn	8.0	-	-	-	-	mA/V
AVI/5.6	Average change in mutual conductance										%
AVI/5.6	Insulation		4.0		Δ gn	-	-	-	-	15	
AVI/5.6		V _a , all = -300V			R	50				-	M
AVI/5.6		V _{g1} , all = -100V				50				-	M
AVI/5.6		V _{g2} , all = -3.0V				50				-	M
AVI/5.6	<u>Life Test End-point (1000 hrs)</u>	Combined AQL	10.0	IA							
AVI/5.6	Inoperatives		4.0								
AVI/5.6	Heater Current		4.0		I _h	0.69	-	-	-	0.81	
AVI/5.6	Heater-cathode Leakage Current	V _{hk} = ±100V	4.0		I _{hk}	-	-	-	-	20	mA
AVI/5.6	Reverse Grid Current	R _{g1} = 100K Max	4.0		I _{g1}	-	-	-	-	1.5	mA
AVI/5.6	Mutual Conductance		4.0		gn	7.6	-	-	-	-	mA/V
	<u>GROUP G</u>										
AVI/2.5	Electrical re-test after 28-day holding period			100%							
AVI/5.6	Inoperatives		0.5		I _{g1}	-	-	-	-	1.0	mA
AVI/5.6	Reverse Grid Current	R _{g1} = 100K Max.	0.5								
<u>NOTES</u>											
1.	Preheat for 5 minutes under test conditions. During the test, I _{g1} shall not be rising nor out of limit after 10 minutes.										
2.	During this test I _{g2} shall rise when g3 is connected to g6.										
3.	The test conditions for Vibration Noise specified in Group C shall apply.										