

Specification MDG/CV4039 Issued 1. dated 26 Nov. 1956 To be read in conjunction with K1001, BS448 and BS1409		SECURITY Specification Valve UNCLASSIFIED UNCLASSIFIED																																											
TYPE OF VALVE - Reliable VHF Power Amplifier Pentode CATHODE - Indirectly-heated ENVELOPE - Glass PROTOTYPE - CV2129, 5763 RETMA DESIGNATION - 6062		MARKING See K1001/4 See also Note A BASE See BS448/BSA/1.1																																											
RATING All limiting values are absolute		CONNECTIONS																																											
Heater Voltage (V) 6.0 Heater Current (A) 0.75 Max. Anode Voltage (Ia = 0) (V) 500 Max. Anode Voltage (Vg2 = 12) (V) 300 Max. Screen Voltage (Ic2 = 0) (V) 500 Max. Screen Voltage (Vg2 = 2) (V) 250 Max. Negative Control Grid Voltage (V) 125 Max. Anode Dissipation (W) 12 Max. Screen Dissipation (W) 2 Max. Heater-Cathode Voltage (V) 100 Max. Bulb Temperature (°C) 250 Max. Operating Frequency (Mc/s) 175 Max. Shock (short duration) (g) 500 Max. Acceleration (continuous vibration) (g) 2.5	Note	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">Pin</th> <th style="width: 80%;">Electrode</th> <th style="width: 10%;"></th> </tr> </thead> <tbody> <tr><td>1</td><td>Anode</td><td>a</td></tr> <tr><td>2</td><td>No connection</td><td>nc</td></tr> <tr><td>3</td><td>Suppressor Grid</td><td>g3</td></tr> <tr><td>4</td><td>Heater</td><td>h</td></tr> <tr><td>5</td><td>Heater</td><td>h</td></tr> <tr><td>6</td><td>Screen Grid</td><td>g2</td></tr> <tr><td>7</td><td>Cathode</td><td>k</td></tr> <tr><td>8</td><td>Control Grid</td><td>g1</td></tr> <tr><td>9</td><td>Control Grid</td><td>g1</td></tr> </tbody> </table>	Pin	Electrode		1	Anode	a	2	No connection	nc	3	Suppressor Grid	g3	4	Heater	h	5	Heater	h	6	Screen Grid	g2	7	Cathode	k	8	Control Grid	g1	9	Control Grid	g1	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;">Dimension (mm)</th> <th style="width: 10%;">Min.</th> <th style="width: 30%;">Max.</th> </tr> </thead> <tbody> <tr><td>A Seated height</td><td>-</td><td>60.5</td></tr> <tr><td>B Diameter</td><td>19.0</td><td>22.2</td></tr> <tr><td>D Overall length</td><td>-</td><td>67.5</td></tr> </tbody> </table>	Dimension (mm)	Min.	Max.	A Seated height	-	60.5	B Diameter	19.0	22.2	D Overall length	-	67.5
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Typical Operating Conditions Measured at Va = Vg2 = 250V; Vg1 = -7.5V, Vc3 = 0 Anode Current (mA) 45 Screen Current (mA) 4.5 Mutual Conductance (mA/V) 7.0 Inner/μ (g1, g2) 16		DIMENSIONS See BS448/BSA/2.1 Size Ref. No. 3																																											
CAPACITANCES (pF) Measured in a fully screened socket, no external shield		MOUNTING POSITION																																											
Ca, g1 (max.) 0.3 C in (nom) 9.5 C out (nom) 4.5	Any																																												
NOTE																																													
A. In addition to the requirements of K1001/4 the RETMA designation shall also be clearly and indelibly marked on the valve. B. <u>Caution to Electronic Equipment Design Engineers</u> - 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 jeopardized 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.																																													

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TESTS

To be performed in addition to those applicable in K1001 Page 2
 Tests shall be performed in the specified order unless otherwise agreed with the Inspecting Authority

Test Conditions - unless otherwise specified												
	Vh (V)	Va (V)	Vg1 (V)	Vg2 (V)	Vg3 (V)	Vhk (V)						
	6.0	250	-7.5	250	0	0						
K1001	Test	Test Conditions	AQL %	Insp. Level	Symbol	Limits						Units
						Min	LAL	Bogey	UAL	Max	ALD	
7.1	Glass Strain	No voltages	6.5	I								
	<u>GROUP A</u> Insulation	Vg1, all = -100V Vg2, all = -300V Va, all = -300V		100%	R	100	-	-	-	-		M
	Reverse Grid Current	Rg1 = 100k Max.		100%	Ig1	100	-	-	-	-	2.5	M uA
	<u>GROUP B</u> Heater Current Heater-cathode Leakage Current Anode Current	Combined AQL Vhk = ± 100V Note 1	1.0 0.65	II	Ih	0.69	-	-	-	0.81		A
	Screen Grid Current		0.65	II	Ihk	-	-	-	-	20		uA
	Mutual Conductance		0.65	II	Ia	33	-	-	-	57		mA
				II	Ia	-	39	45	51	-	13.2	mA
			0.65	II	Ig2	-	-	-	-	7.0		mA
			0.65	II	gm	5.6	-	-	-	9.0		mA/V
				V2	gn	-	6.3	7.0	7.7	-	1.55	mA/V
	<u>GROUP C</u> g3 Continuity	Combined AQL Vg3 = 250V; Note 2	6.5	I								
	Anode Current (2)	Vg1 = 715V	2.5	I	Ia	-	-	-	-	15		mA
	Change in Mutual Conductance	Vh = 5.7V	2.5	I	Δ gm	-	-	-	-	15		%
	Inner u		2.5	I	u(g1, g2)	13	-	-	-	20		-
11.1	Vibration Noise	Va(b) = 250V; Vg1 = -15V RL = 2k	2.5	I	Va AC	-	-	-	-	250		mV rms
	<u>GROUP D</u> Base Strain	No voltages	6.5	IA								
	Capacitance	Measured on a 1 MC bridge with the valve mounted in a fully screened socket. No shield	6.5	IC	Ca, g1 C in C out	- 7.9 3.0	- - -	- - -	- - -	0.3 11.1 6.0		pF pF pF
	Peak Cathode Current	Va = Vg1 = Vg2 = Vg3 = 200V peak; Note 3	6.5	IA	Ik	4.5	-	-	-	-		A
	Reverse Grid Current (3)	Vh = 6.6V; Va = 300V; set Vg1; Vg2 = 250V; Note 4	6.5	IA	Ig1	-	-	-	-	2.5		uA
	Reverse Screen Grid Current	Va = 0; set Vg1; Vg2=170V r.m.s.; Note 5	6.5	IA	Ig2	-	-	-	-	500		uA
	Power Oscillation	Note 6	6.5	IA	Po	1.5	-	-	-	-		W

K1001	Test	Test Conditions	AQL %	Insp. Level	Symbol	Limits						Units
						Min.	LAL	Bogev	UAL	Max.	ALD	
11.2	<u>GROUP E</u> Resonance Search	Va(b) = 250V; Vg1 = -15V; RL = 2k. Frequency = 25-500 c/s	2.5	IC	Va AC	-	-	-	-	Record	mV r.n.s.	
11.3	Fatigue	Vh = 6.6V switched 1 min. 'on' and 3 mins. 'off'; Va = Vg2 = 0; Acceleration = 5g Frequency = 170 c/s Duration = 30+30+30 hrs.		IA	f	200	-	-	-	-	c/s	
	<u>Post Fatigue Tests</u>											
	Heater-Cathode Leakage Current	Vhk = ± 100V	2.5		Ihk	-	-	-	-	40	uA	
	Reverse Grid Current	Rgl = 100k Max.	2.5		Igl	-	-	-	-	5.0	uA	
	Vibration Noise	Note 7	2.5		Va AC	-	-	-	-	500	mV r.n.s.	
	Power Oscillation	Note 6	2.5		Po	1.0	-	-	-	-	W	
11.4	Shock	Hammer angle = 30°; No voltages		IA								
	<u>Post Shock Tests</u>											
	Heater-cathode Leakage Current	Vhk = ± 100V	2.5		Ihk	-	-	-	-	40	uA	
	Reverse Grid Current	Rgl = 100k Max.	2.5		Igl	-	-	-	-	5.0	uA	
	Vibration Noise	Note 7	2.5		Va AC	-	-	-	-	500	mV r.n.s.	
	Power Oscillation	Note 6	2.5		Po	1.0	-	-	-	-	W	
	<u>GROUP F</u>											
AV1/5	Life	Vhk = 100V, heater positive Rgl = 100k ± 20% RK = 150 ± 10% CK = 1000 uF										
AV1/5.1	<u>Stability Life Test</u> <u>Change in Anode Current</u>										%	
	Change in Mutual Conductance		1.0	I	Δgm	-	-	-	-	10.0	%	
AV1/5.3	Intermittent Life Test			IA								
	<u>Life Test End-point</u> <u>500 hrs.</u>	Combined AQL	6.5									
AV1/5.6	Inoperatives		2.5									
	Heater Current		2.5		Ih	0.64	-	-	-	0.81	A	
	Heater-cathode Leakage Current	Vhk = ± 100V	2.5		Ihk	-	-	-	-	30	uA	
	Reverse Grid Current	Rgl = 100k Max.	2.5		Igl	-	-	-	-	5.0	uA	
	Mutual Conductance		2.5		gm	4.8	-	-	-	-	mA/V	
	Average Change in Mutual Conductance				Δgm	-	-	-	-	15	%	
	Anode Current		4.0		Ia	28	-	-	-	57	mA	
	Power Oscillation		4.0		Po	1.0	-	-	-	-	W	
	Insulation		4.0		R							
		Vg1, all = -100V				50	-	-	-	-	M	
		Vg2, all = -300V				50	-	-	-	-	M	
		Va, all = -300V				50	-	-	-	-	M	

K1001	Test	Test Conditions	AQL %	Insp. Level	Symbol	Limits						Units
						Min.	LAL	Bogey	UAL	Min.	ALD	
AVI/5.4	<u>Life Test End-Point-1000 hrs.</u>	Combined AQL	10.0									
	Inoperatives		4.0									
	Heater Current		4.0		In	0.64	-	-	-	0.81		A
	Heater-Cathode Leakage current	Vhk ± 100V	4.0		Ink	-	-	-	-	40		UA
	Reverse Grid Current	Rgl = 100k Max.	4.0		Ig1	-	-	-	-	4.0		UA
	Mutual Conductance		4.0		gm	4.5	-	-	-	-		mA/V
	Anode Current		6.5		Ia	25	-	-	-	-		mA
Power Oscillation		6.5		Po	0.8	-	-	-	-		W	
	<u>GROUP G</u>											
AVI/2.5	Re-test after 28-day holding period			100%								
AVI/5.6	Inoperatives Reverse Grid Current	Rgl = 100k Max.	0.5 0.5		Ig1	-	-	-	-	2.5		UA

NOTES

- With Vg1 applied in turn to pins 8 and 9, Ia must show no change. During this test the anode current shall not change when the valve is tapped.
- During this test the anode and screen currents shall change from values obtained under normal conditions.
- Voltage waveform shall be a half-sine wave; PRF = 50pps; tp = 12.5usec max.
- Adjust Vg to give Ia = 40 mA. Ig1 should not be rising or outside limit after 10 minutes.
- Measured in an approved test circuit. Set Vg1 to give Ig2 = 10mA.
- Measured in an approved test circuit with supply, Va(b) = 300V; Ia = 50mA; Rgl = 10k and f = 135 Mc/s, the power output shall be measured using a calibrated load.
or alternatively,

The valve may be tested in an approved oscillator circuit loaded with a diode measuring circuit,

Va = 250V

Vg2 = 250V through 10K ± 10%

Diode load resistor = 22k ± 10%

Diode = CV4007 or CV4025 with both sections strapped.

The diode currents corresponding with the Po Limits are

Po Watts	IdmA
1.5	6.0
1.0	4.75
0.8	4.25

- The test conditions for vibration noise in Group C shall apply.