

Specification MDS/CV4062 Issue 2, Dated 23 Nov. 1956 To be read in conjunction with K1001, BS448 and BS1409	SECURITY	
	Specification UNCLASSIFIED	Valve UNCLASSIFIED

Indicates a change →

TYPE OF VALVE - Reliable Low Impedance Pentode		MARKING	
CATHODE - Indirectly-heated		See K 1001/4.	
ENVELOPE - Glass		RACE	
PROTOTYPE - CV2179		See BS 448: E70/1.1	
RATING		Note	
All limiting values are absolute.			
Heater Voltage (V)	6.3		
Heater Current (A)	0.64		
Max. Anode Voltage (V)	300		
Max. No-load Anode Voltage (V)	500		
Max. Anode Dissipation (W)	9		
Max. Screen Voltage (V)	300		
Max. Screen Dissipation (W)	3		
Max. Heater - Cathode Voltage (V)	250		
Pentode Connection (Note B)			
Mutual Conductance (mA/V)	9.5		
Amplification Factor	220		
Anode Impedance (ohms)	23000		
Triode Connection (Note C)			
Mutual Conductance (mA/V)	12		
Amplification Factor	10		
Anode Impedance (ohms)	835		
Max. Bulb Temperature (°C)	200	D	
Max. Altitude for full rating (ft)	10000	D	
Max. Shock (short duration) (g)	500	D	
Max. Acceleration (continuous vibration) (g)	2.5	D	
CONNECTIONS			
Pin	Electrode		
1	Control grid	g1	
2	Cathode & Suppressor	k + g3	
3	Heater	h	
4	Heater	h	
5	Anode	a	
6	Internally connected	1/e	
7	screen grid	g2	
Dimensions			
See BS 448/E702.1. Size Ref. No. 5			
Dimensions (mm)	Min.	Max.	
A seated height	-	63.5	
B diameter	16	19	
D overall length	-	70.5	
MOUNTING POSITION			
Any			
CAPACITANCES (pF)			
Cg1 (nom.)	0.45		
Cg2 (nom.)	11.0		
Cee (nom.)	8.5		

NOTESB. Measured at $V_a = 165V$; $V_{g2} = 165V$; $I_a = 55mA$ C. Measured at $V_a = V_{g2} = 165V$; $I_e = 65mA$

D. Caution to Electronic Equipment Design Engineers: Special attention should be given to the temperature of valves 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.

To be performed in addition to those applicable in K1001

Tests shall be performed in the specified order unless otherwise agreed with the Inspecting Authority.

Test Conditions unless otherwise specified															
		Vh(V)	Va(V)	Vg2(V)	Ia(mA)	LIMITS						Units			
		6.3	165	165	55	AQL %	Insp. Level	Sym- bol	Min	LAL	Bogey	UAL	Max	ALD	
7.1	Class Strain	No Voltages		6.5	1										
	<u>GROUP A</u>														
	Insulation	Vg ₁ -all = -100V Vg ₂ -all = -300V		100%	R	100	-	-	-	-	-	-	-		M
	Reverse Grid Current	Va -all = -300V Rg ₁ = 500k Max		100%	R	100	-	-	-	-	-	-	1.5		M
				100%	Ig ₁	-	-	-	-	-	-	-	-		μA
	<u>GROUP B</u>	Combined AQL		1.0											
	Heater Current	Vhk = 250V		0.65	II	Ih	0.58	-	0.61	-	0.70	-	-		A
	H-C Leakage Current	cathode positive		0.65	II	Ihk	-	-	-	-	50	-	-		μA
	Negative Grid Voltage (1)			0.65	II	Vg ₁	6	-	-	10.0	-	12	-		V
	Screen Current			0.65	II	V ₂	-	7.5	9	10.5	-	-	-	3.33	V
	Mutual Conductance			0.65	II	Ig ₂	7	-	-	-	11	-	-		mA
				0.65	II	gm	7	-	-	-	12	-	-		mA/V
					V ₂	gm	-	8.25	9.5	10.75	-	-	-	2.78	mA/V
	<u>GROUP C</u>	Combined AQL		6.5											
	Negative Grid Voltage (2)	Ia = 30 μA		2.5	I	Vg ₁	-	-	-	-	-	40	-		V
	Emission	Ia = 120mA Anode + g ₁ + g ₂ Strapped		2.5	I	Va	-	-	-	-	-	20	-		V
	Vibration Noise	Va(b) = 250 V; R ₁ = 2k Rg ₁ = Rg ₂ = 10k Rk = 470, Ck = 200 uF		2.5	I	VaAC	-	-	-	-	-	75	-		mV RMS
	Amplification Factor	Note 1		2.5	I	μ	7.5	-	-	-	-	12.5	-		
7.2	<u>GROUP D</u>														
	Base Strain			6.5	IA										
	Capacitances	Measured on 1MΩ/s bridge with the valve mounted in a fully screened socket. No shield.		6.5	IC	Cg _{g1}	-	-	0.45	-	0.6	-	-		pF
						Cg _e	10	-	11	-	12	-	-		"
						Cae	7.5	-	8.5	-	9.5	-	-		"

K1001	Test	Test Conditions	AQL %	Insp Level	Symbol	LIMITS						Units
						Min	LAL	Bogey	UAL	Max	ALD	
	<u>GROUP E</u>											
11.2	Resonance Search	RL = 2.2K Frequency = 25-500 c/s	2.5	IC	Va(AC) f	200	-	-	-	record.		mV RMS c/s
11.3	Fatigue	Vh = 6.9V switched 1 min. on 3 mins. off Va = Vg2 = 0 Acceleration = 5g Duration = 30, 39, 30 hrs Frequency = 1700/s		IA								
	<u>Post Fatigue Tests</u>	Combined AQL	6.5									
	H-C Leakage Current	Vhk = 250V	2.5		Ihk	-	-	-	-	100		µA
	Reverse Grid Current	Rg1 = 500k max	2.5		Igl	-	-	-	-	2.5		µA
	Mutual Conductance	Note 2	2.5		gm	6.5	-	-	-	-		mA/V
	Vibration Noise	Note 2	2.5		Va (AC)	-	-	-	-	100		mV RMS
11.4	Shock	Hammer angle = 30° No voltages		IA								
	<u>Post Shock Tests</u>	Combined AQL	6.5									
	H-C Leakage Current	Vhk = 250V	2.5		Ihk	-	-	-	-	100		µA
	Reverse Grid Current	Rg1 = 500 k max	2.5		Igl	-	-	-	-	2.5		µA
	Mutual Conductance	Note 2	2.5		gm	6.5	-	-	-	-		mA/V
	Vibration Noise	Note 2	2.5		Va (AC)	-	-	-	-	100		mV RMS
	<u>GROUP F</u>											
AV1/5	Life	Va = 169V Ia = 55mA Vg2 = 169V Vhk = 200V AC										
AV1/5.1	<u>Stability Life Test</u> Change in Mutual Conductance		1.0	I	gm	-	-	-	-	10		%
AV1/5.3	<u>Intermittent Life Test</u>			IA								
	<u>Life Test End-point (500 hours)</u>	Combined AQL	6.5									
	Inoperatives		2.5		Ih	0.58	-	-	-	0.7		A
	Heater Current		2.5		Ihk	-	-	-	-	75		µA
	H-C Leakage Current	Vhk = 250V	2.5		Igl	-	-	-	-	2		µA
	Reverse Grid Current	Rg1 = 500 k max	2.5		gm	6.5	-	-	-	12		mA/V
	Mutual Conductance do Average change		2.5		gm	-	-	-	-	15		%
	Negative Grid Voltage		4.0		Vg1	5.5	-	-	-	12		V
	Electrode Insulation	See Group A	4.0		R	50	-	-	-	-		M
	<u>Life Test End-point (1000 hours)</u>	Combined AQL	10									
	Inoperatives		4.0		Ih	0.58	-	-	-	0.7		A
	Heater Current		4.0		Ihk	-	-	-	-	100		µA
	H-C Leakage Current	Vhk = 250V	4.0		Igl	-	-	-	-	2.5		µA
	Reverse Grid Current	Rg1 = 500 k max	4.0		gm	6.0	-	-	-	12		mA/V
	Mutual Conductance		4.0		gm	-	-	-	-	12		%
	Negative Grid Voltage		6.5		Vg1	5.0	-	-	-	12		V

K100	Test	Test Conditions	AQL %	Insp. Level	Symbol	LIMITS						Units
						Min.	LAL	Bogey	UAL	Max.	Ald	
	<u>GROUP G</u>											
AVI/ 2.5	Re-test after 28 days holding period											
AVI/ 5.6	Inoperatives		0.5	100%								
	Reverse Grid Current	Rgl = 500K Max	0.5	100%	Igl	-	-	-	-	2.5		μ A

NOTES

1. Measured with anode and screen grid connected together.

$$V_a + V_{g2} = 165V$$

$$I_c = 65mA$$

2. The test conditions for the Vibration Noise test in Group C shall apply.