MINISTRY OF SUPPLY - DLRD/RRE

VALVE ELECTRONIC

CV4005

Specification M08/CV4005

Issue 4 Dated 6th March '57

To be read in conjunction with K1001, BS448 and BS1409

SECURITY	
Specification	Valve
UNCLASSIFIED	UNCLASSIFIED

→ Indicates a change

TYPE OF VALVE - Reliable Rectifier, High Vacuum, Full-wave

CATHODE - Indirectly-heated

ENVELOPE - Glass

PROTOTYPE - CV493

RETMA DESIGNATION - 6063

MARKING

See K1001/4
(See also note D)

BASE

See BS 448/B7G/1.1

RATING

			Note
Heater Voltage	(V)	6.3	A
Heater Current	(A)	0.6	
Max. Peak Inverse Voltage	(kV)	1.375	
Max. Mean Anode Current	(mA)	75	
Max. Peak Anode Current	(mA)	230	
Max. Surge Anode Current	(mA)	750	
Max. Heater-cathode Voltage	(V)	450	
Max. Shock (short duration)	(g)	700	
Max. Acceleration (continuous operation)	(g)	2.5	
Max. Bulb Temperature	(°C)	165	
TYPICAL OPERATING CONDITIONS (for 50 c/s operation)			
Condenser Input to Filter			
Max. RMS Voltage per Anode	(V)	325	
Min. Supply Impedance per Anode	(ohms)	150	
Max. DC Output	(mA)	70	
Max. Reservoir Condenser	(μF)	32	
Choke Input to Filter			
Max. RMS Voltage per Anode	(V)	450	
Max. DC Output	(mA)	70	
Max. Choke Inductance	(H)	8	

CONNECTIONS

Pin	Electrode	
1	Anode 2	a"
2	Internally connected	i/c
3	Heater	h
4	Heater	h
5	Internally connected	i/c
6	Anode 1	a'
7	Cathode	k

DIMENSIONS

See BS448/B7G/2.1
Size Ref. No.4

Dimension (mm)	Min.	Max.
A Seated height	-	60.5
C Diameter	16.0	19.0
D Overall length	-	67.5

MOUNTING POSITION

Any

NOTES

A. Max. variation of heater voltage = ± 10%

B. All limiting values are absolute.

C. Delayed switching must be used when the valve is used on supply frequencies above 60 c/s.

D. In addition to the requirements of K1001/4, the RETMA designation shall also be clearly and indelibly marked on the valve.

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 RMS)	R_L (ohms)	C (µF)
6.3	400	5.7k	8

Note 1

K1001	Test	Test Conditions	AQL %	Insp. Level	Symbol	Limits Min.	LAL	Bogey	UAL	Max.	AID	Units
7.1	Glass Strain	No voltages	6.5	I								
	GROUP A											
5.2	Insulation	Va-all = 500V Note 5		100%	R	100	-	-	-	-	-	M
	Voltage Breakdown	Note 2		100%								
	GROUP B	Combined AQL	1.0									
	Heater Current		0.65	II	Ih	0.55	-	0.60	-	0.65	-	A
	H-K Leakage Current	Vhk = V out Note 3	0.65	II	Ihk	-	-	-	-	150	-	µA
	Anode Voltage (DC)	Set Ia = 140mA DC Note 5	0.65	II	Va	-	-	-	-	50		V
	or alternatively Anode Current	Va = 50V, Note 5	0.65	II	Ia	140	-	-	-			mA
	GROUP C											
	Output Current		2.5	I	Idc	70	-	-	-		-	mA
→	Not Switch	Note 6	2.5	I								
	GROUP D											
7.2	Base Strain	No voltages	6.5	IA								
	Hot Switch	Supply frequency = 1.5 to 2.4 kc/s Notes 4 and 6	6.5	IA								
	GROUP E	Combined AQL	6.5									
11.3	Fatigue	Va = 0, Vh = 7.0V Switched 1 min on 3 mins off. Frequency = 170 c/s Min peak accel=5g Duration =30, 39, 30 hrs		IA								
	Post Fatigue											
	H-K Leakage Current	Vhk = V out Note 3	2.5		Ihk	-	-	-	-	150	-	µA
	Output Current		2.5		Idc	68	-	-	-	-	-	mA
11.4	Shock	No voltages Hammer angle = 30°		IA								
→	Post-shock											
	H-K Leakage Current	Vhk = V out Note 3	2.5		Ihk	-	-	-	-	150	-	µA
	Output Current		2.5		Idc	68	-	-	-	-	-	mA

TESTS (Cont'd)

CV4005

K1001	Test	Test Conditions	AQL %	Insp. Level	Sym-bol	Limits						Units
						Min	LAL	Bogey	UAL	Max.	ALD	
	GROUP F											
AVI/5	Life	Note 7										
	Life Test End Point (500 hrs)	Combined AQL	6.5	IA								
AVI/5.6	Inoperatives		2.5									
	Heater Current		2.5		Ih	0.55	-	-	-	0.65	-	A
	H-K Leakage Current	Note 3	2.5		Ihk	-	-	-	-	150	-	µA
	Output Current		4.0		Idc	68	-	-	-	-	-	mA
	Life Test End Point (1000 hrs)	Combined AQL	10	IA								
AVI/5.6	Inoperatives		4.0									
	Heater Current		4.0		Ih	0.55	-	-	-	0.65	-	A
	H-K Leakage Current	Note 3	4.0		Ihk	-	-	-	-	150	-	µA
	Output Current		6.5		Idc	65	-	-	-	-	-	mA
	GROUP G											
AIX/2.5	Electrical re-test after 28 days holding period			100%								
AVI/5.6	Inoperatives		0.5									

NOTES

1. Measured in a 50 c/s full-wave rectifying circuit. Initially, the total supply impedance including transformer) shall be adjusted so that a valve giving an output current of 70 mA DC for a voltage drop across the valve of 22V DC per anode, will give an output current of 75 mA with a load resistance of 5.7k and a reservoir condenser of 8 µF. The heater-cathode voltage shall be the output voltage.

2. The valve shall be cold when inserted into the test socket. Alternatively, it may be inserted into a pre-heating panel and operated under conditions similar to those obtaining in Note 1, with the output voltage appearing between heater and cathode. Valves shall be rejected which spark, flash more than once, or show heater-cathode breakdown initially or when fully heated.

3. The output voltage shall be applied through a 450k resistance between heater and cathode.

4. As Note 1, but with the reservoir condenser adjusted to suit the test frequency. Test at any convenient frequency within the range 1.5 to 2.4 kc/s.

5. Test each anode circuit separately, with the other section connected to cathode.

6. Arcing within the valve when the anode voltage is switched on and off 6 times shall be cause for rejection. This test may be combined with the voltage breakdown test in Group A.

7. Under life test conditions the values of R_L and C given in the test conditions may be regarded as approximate and shall be adjusted initially to give Idc = 55 mA. The limiting resistance shall be adjusted to give a peak current greater than 205 mA and a heater-cathode voltage equal to the output voltage.