

MINISTRY OF SUPPLY - DLJD/RRE

Specification M.O.S. CV4036 Issue 2 Dated 6 Nov. 1956 To be read in conjunction with K1001, B8448 & B81409	SECURITY Specification Valve UNCLASSIFIED UNCLASSIFIED
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Indicates a Change

TYPE OF VALVE - Reliable Half-wave Rectifier with Flexible Leads CATHODE - Indirectly-heated ENVELOPE - Glass PROTOTYPE - CV2235	MARKING See K1001/4																																																																																																										
<p style="text-align: center;">RATING All limiting values are absolute</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;"></td> <td style="width: 10%;"></td> <td style="width: 10%; text-align: center;">Note</td> <td style="width: 20%;"></td> </tr> <tr> <td>Heater Voltage</td> <td style="text-align: right;">(V)</td> <td style="text-align: center;">6.3</td> <td style="text-align: center;">B</td> </tr> <tr> <td>Heater Current</td> <td style="text-align: right;">(A)</td> <td style="text-align: center;">1.15</td> <td></td> </tr> <tr> <td>Max. Peak Inverse Voltage</td> <td style="text-align: right;">(kV)</td> <td style="text-align: center;">1.8</td> <td></td> </tr> <tr> <td>Max. Peak Anode Current</td> <td style="text-align: right;">(mA)</td> <td style="text-align: center;">900</td> <td></td> </tr> <tr> <td>Max. Heater-Cathode Voltage</td> <td style="text-align: right;">(V)</td> <td style="text-align: center;">650</td> <td></td> </tr> <tr> <td>Max. 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Altitude for full PIV rating	(ft)	60,000	B	Max. Shock (short duration)	(g)	500		Max. Acceleration (continuous vibration)	(g)	2.5		1. At 500V rms Max. (Note C)				Max. Mean Anode Current	(mA)	300		Min. Limiting Resistance per valve	(ohms)	300		Max. Reservoir Condenser	(µF)	16		2. At 625V rms Max. (Note D)				Max. Mean Anode Current	(mA)	250		Min. Limiting Resistance per valve	(ohms)	500		Max. Reservoir Condenser	(µF)	16		<p style="text-align: center;">BASE B9A/7</p> <p style="text-align: center;">CONNECTIONS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">Lead</th> <th style="width: 90%;">Electrode</th> </tr> </thead> <tbody> <tr><td>1</td><td>Internally connected</td></tr> <tr><td>2</td><td>Internally connected</td></tr> <tr><td>3</td><td>Cathode</td></tr> <tr><td>4</td><td>Heater</td></tr> <tr><td>5</td><td>Heater</td></tr> <tr><td>6</td><td>Internally connected</td></tr> <tr><td>7</td><td>Internally connected</td></tr> <tr><td>8</td><td>Internally connected</td></tr> <tr><td>9</td><td>Internally connected</td></tr> <tr><td>TC</td><td>Anode</td></tr> </tbody> </table> <p style="text-align: center;">TOP CAP See K1001/AI/D5.2 with flexible lead 32 mm min. length</p> <p style="text-align: center;">DIMENSIONS See K1001/AI/D11</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Dimensions (mm)</th> <th style="width: 15%;">Min.</th> <th style="width: 15%;">Max.</th> </tr> </thead> <tbody> <tr><td>A</td><td style="text-align: center;">66.5</td><td style="text-align: center;">76</td></tr> <tr><td>B</td><td style="text-align: center;">19</td><td style="text-align: center;">22.2</td></tr> <tr><td>D</td><td style="text-align: center;">38</td><td style="text-align: center;">-</td></tr> </tbody> </table> <p style="text-align: center;">MOUNTING POSITION Any</p>	Lead	Electrode	1	Internally connected	2	Internally connected	3	Cathode	4	Heater	5	Heater	6	Internally connected	7	Internally connected	8	Internally connected	9	Internally connected	TC	Anode	Dimensions (mm)	Min.	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<p style="text-align: center;">NOTES</p> <p>B. <u>Caution to Electronic Equipment Design Engineers:</u> Special attention should be given to the working temperature of a valve operating in an airborne equipment. 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 the heater voltage rating is exceeded; life and performance reliability are directly related to the degree that the regulation of the heater voltage is maintained at its centre-rated value.</p> <p>C. Two valves operating in a full-wave circuit. Input Voltage = 500 - 0 - 500V rms.</p> <p>D. Two valves operating in a full-wave circuit. Input Voltage = 625 - 0 - 625V rms.</p>																																																																																																											

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 Va RL C
 (V) (Vrms) (Ohms) (µF)
 6.3 625 5000 8 Note 1

K1001	Test	Test Conditions	AQL %	Insp. Level	Symbol	Limits						Units
						Min.	LAL	Bogay	UAL	Max.	ALD	
7.1	Glass Strain	No voltages	6.5	I								
	<u>GROUP A</u> Voltage Breakdown	Note 2		100%								
	<u>GROUP B</u> Heater Current H-K Leakage Current Anode Voltage Output Current	Combined AQL Vhk = 330V Note 6 Set Ia = 150mA DC	1.0 0.65 0.65 0.65 0.65	II II II II	Ih Ihk Va Idc	0.9 - 18 120	- - - -	- - - -	1.4 150 26 -		A µA V mA	
5.12	<u>GROUP C</u> Hot Switch Lead Fragility Output Current Hot Switch	Note 3 No Voltages Va = 500V rms Note 4 Supply frequency = 1.5 to 2.4 kcs Notes 3 & 7	2.5 6.5 2.5 6.5	I IA IA IA	 Idc	145 -	- - -	- - -			 mA	
11.3	<u>GROUP D</u> Fatigue <u>Post Fatigue Tests</u> H-K Leakage Current Voltage Breakdown Output Current	Combined AQL Vh = 7.0V switched 1 min. on and 3 mins off Va = 0 Frequency = 170 c/s; Min. peak Acceleration = 5g Duration = 30,39,30 hrs.	6.5 2.5 2.5 2.5	 IA	 Ihk Idc	 - 120	- - -	- - -	200 -		 µA mA	
11.4	Shock <u>Post-Shock Tests</u> H-K Leakage Current Voltage Breakdown Output Current	Hammer angle = 30° No voltages Vhk = 330V Note 6 Note 2	 2.5 2.5 2.5	 IA	 Ihk Idc	 - 120	- - -	- - -	200 -		 µA mA	

CV4036/2/2

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K1001	Test	Test Conditions	AQL	Insp. Level	Symbol	Limits						Units
						Min.	LAL	Bogey	UAL	Max.	ALD	
A VI/ 5	<u>GROUP E</u> Life	Va = 500V rms 150V Vhk = V out + 22V rms C = 8 uF Note 5										
A VI/ 5.1	<u>Stability Life Test</u> Change in Anode Voltage	Set Ia = 150 mA	1.0	I	ΔV_a	-	-	-	-	10		%
A VI/ 5.3	<u>Intermittent Life Test</u>	As above		IA								
	<u>Life Test End-point</u> (500 hours)	Combined AQL	6.5									
A VI/ 5.6	Inoperatives Heater Current		2.5		Ih	0.9	-	-	-	1.4		A
	H-K Leakage Current	Vhk = 330V Note 6	2.5		Ihk	-	-	-	-	150		μ A
	Output Current		4.0		Ide	120	-	-	-	-		mA
	<u>Life Test End-point</u> (1000 hours)	Combined AQL	10.0									
A VI/ 5.6	Inoperatives Heater Current		4.0		Ih	0.9	-	-	-	1.4		A
	H-K Leakage Current	Vhk = 330V Note 6	4.0		Ihk	-	-	-	-	150		μ A
	Output Current		6.5		Ide	120	-	-	-	-		mA
AIX/ 2.5	<u>Group F</u> Electrical re-test after 28 days holding Period			100%								
AVI/ 5.6	Inoperatives		0.5									

NOTES

1. Measured in a 50 c/s half-wave circuit. Initially, the total supply impedance (including transformer) shall be adjusted, so that a valve giving an output current of 150 mA DC for a voltage drop across the valve of 22V DC, will give an output current of 125 mA with an anode load resistance of 5k and a reservoir condenser of 8 μ F. The heater-cathode voltage shall be the output voltage. The anode voltage shall be measured directly from anode to earth using a normal rectifier meter.
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. Arcing within the valve shall be cause for rejection when the anode voltage is switched on and off six times. This test may be combined with the voltage breakdown test in Group A.
4. As for Note 1, except that the output current shall be 150 mA with a load resistor of 3k.
5. The Life test circuit shall be adjusted so that, using a load resistor of 3k (approx) and a reservoir capacitor of 8 μ F (approx), an output current of 150 mA is obtained with a peak current greater than 900 mA but not more than 1A.
6. Measured with cathode positive with respect to heater and with a series resistor of 330k.
7. As for 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.