

# Scale-of-ten Counter

Specially processed for long life

# GC10B/L, GC10/4B/L

(CV.6044) (CV.6100)

## Limit Ratings

	Rectangular Pulse Drive	Sine Wave Drive
Max. speed	4,000 p.p.s.	4,000 c.p.s.
Max. striking voltage	350 V	350 V
Max. anode current	550 $\mu$ A	550 $\mu$ A
Min. anode current	250 $\mu$ A	250 $\mu$ A
Max. input signal peak to peak	140 V	171 V
*Max. guide bias	60 V	
Max. $K_o$ bias	-20 V	
Max. $K_o$ load	100 k $\Omega$	
Max. guide bias resistance	220 k $\Omega$	

## Characteristics

Running voltage at 450 $\mu$ A	190 V	190 V
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## Recommended Operating Conditions

Supply voltage	400 V	400 V
Anode resistor	470 k $\Omega$	470 k $\Omega$
Signal amplitude	-120 V	55 V r.m.s.
Both Guides		
Pulse duration	80 $\mu$ S	
Both Guides		
Signal delay, 2nd guide	80 $\mu$ S	
Signal delay, 2nd guide		45°
*Bias voltage	35 V	9 V
Both Guides		
Bias voltage $K_o$	-10 V	-10 V
Output cathode load	33 k $\Omega$	33 k $\Omega$

\* With rectangular pulse drive with a variable mark/space ratio this guide bias must be maintained, e.g., by D.C. restoration.

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	Test	Test Conditions	AQL %	Insp. Level	Symbol	Limits		Units	Notes
						Min.	Max.		
<b>GROUP A</b>									
<b>Acceptance Tests</b>									
a	Insulation	To be measured between any one electrode and parallel combination of all the others at 170 V.		100%		100		MΩ	1
b	Striking Voltage	A — K <sub>o</sub> V <sub>b</sub> = 350 V		100%	V <sub>s</sub>				1, 3
c	Scaling Accuracy	V <sub>b</sub> = 400 V V <sub>1</sub> = +35 V V <sub>2</sub> = -40 V T = 60 μS Frequency = 4.0 kc/s		100%					1, 2
d	Running Voltage	V <sub>b</sub> = 400 V		100%	V <sub>r</sub>	184	194	V	1, 4
<b>GROUP B</b>									
<b>Life Test</b>									
a	Survival running life test	Combined AQL V <sub>b</sub> = 500 V V <sub>1</sub> = +35 V V <sub>2</sub> = -40 V T = 60 μS	1.5	IA					5, 7
Tests to be performed at end of survival running test									
b	Scaling Accuracy	V <sub>b</sub> = 400 V V <sub>1</sub> = +35 V V <sub>2</sub> = -40 V T = 60 μS Frequency = 4.0 kc/s							2
c	Running Voltage	V <sub>b</sub> = 400 V			V <sub>r</sub>	176	206	V	4

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						Min.	Max.		
	<b>GROUP C</b> <b>Electrical Retest</b> Not more than 7 days prior to application for Services final approval								6
a	Scaling Accuracy	$V_b = 400\text{ V}$ $V_1 = +35\text{ V}$ $V_2 = -40\text{ V}$ $T = 60\ \mu\text{S}$ Frequency = 4.0 kc/s		100%					2
b	Running Voltage	$V_b = 400\text{ V}$		100%	$V_r$	184	194		4

**NOTES**

1. Tests of Group A are to be applied directly after completion of manufacture.
2. The tube shall scale without error the first applications of test signals (illustrated in Fig. 1). Test signals are to be applied for at least 1/10th second. The test circuit of Fig. 2 is applicable.
3.  $K_{1.9}$  1st guide and 2nd guide electrodes to be disconnected. Illuminations of tube to be 5—50 ft. candles. Tube to conduct in less than 10 seconds.
4. The  $K_{1.9}$  1st guide and 2nd guide electrodes will be successively earthed through a suitable make before break type switch to cause 30 gaps to conduct in turn. The running voltage across each gap shall be within the specified limits. For this test the  $K_0$  and  $K_{1.9}$  electrode will be commoned. The test circuit to Fig. 3 is applicable. The measurement of the running volts is to be made between 0.1 and 2.0 seconds after the contacts of the make before break type switch have broken.
5. The tubes selected for this test are to be run in the circuit shown in Fig. 4. One application of the pulses shown in Fig. 1 is to be made every  $85 \pm 5$  hours. The tube is to receive 20 such pulses and then be removed. A tube which fails to step on the application of the test pulses shall be rejected. The normal guide bias is to be +60 V which will be reduced to +35 V immediately prior to the application of pulses.
6. During the period between the completion of Group A tests and the commencement of Group C tests no further processing shall be applied.
7. A lot shall consist of not more than one calendar month's production or 1301 whichever is the greater. For lots of 800 and less sampling codes shall be as for lots 801—1300.



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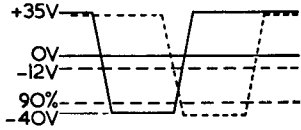


Fig. 1

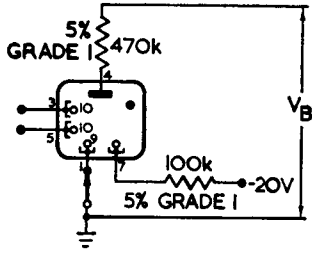


Fig. 2

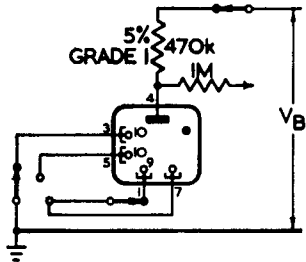


Fig. 3

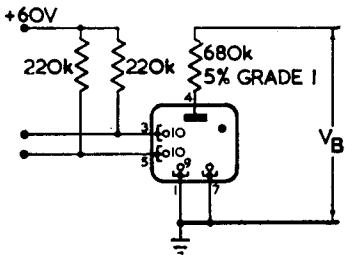


Fig. 4



**Mechanical Data**

Mounting position

Any

For visual indication the tube is viewed through the dome of the bulb.

Alignment

Cathode "O" is aligned with pin 6 to an accuracy of  $\pm 12^\circ$ .

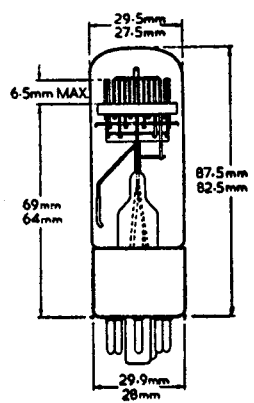
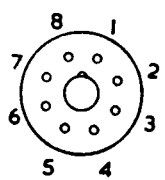
Escutcheons

N78211 Bakelite, or N79368 Brass

Base

I.O.

Base Connections (underside view)



**GC 10 B, L**

- Pin 1 Common cathodes
- 2 —
- 3 1st Guides
- 4 Anode
- 5 2nd Guides
- 6 —
- 7 Cathode "O"
- 8 —

**GC 10/4 B/L**

- Pin 1 Common cathodes
- 2 Cathode "5"
- 3 1st Guides
- 4 Anode
- 5 2nd Guides
- 6 Cathode "9"
- 7 Cathode "0"
- 8 Cathode "3"

