AMPEREX TUBE TYPE OG3/85A2

The OG3/85A2 is a miniature voltage reference tube of the cold cathode discharge type, for use in D.C. Amplifiers, stable regulated power supplies, oscilloscope calibrators and similar applications. Among its features are: (1) better regulation (2) larger allowable operating current range (3) reproducibility between tubes with 5 volt tolerance.

GENERAL CHARACTERISTICS

ELECTRICAL

Maximum ratings, absolute values

D.C. Starting Voltage (max.)	125 volts
D.C. Operating Current (max.)	10 ma
D.C. Operating Current (min.)	1 ma
Ambient Temperature Limits	−55 to + 90°C

Typical Operation

Recommended D.C. Operating Current	6 ma
A.C. Resistance at 6 ma (average value)	300 ohms
A.C. Resistance at 6 ma (max. value)	450 ohms
D.C. Operating Voltage at 6 ma, Variation From Tube to Tube	83 to 87 volts
Temp. Coefficient of Operating Voltage	−2.7 mv/°C
Percentage Variation of Operating Voltage During First 300 hrs. of Life (max.)	0.3 %
Percentage Variation of Operating Voltage During Subsequent 1000 hrs. of Life (max.)	0.2 %
Short-term (100 hrs. max.) Variation of Operating Voltage After First 300 hrs. of Life (max.)	0.1 %

MECHANICAL

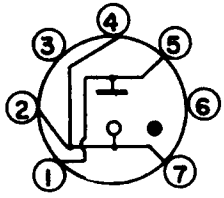
Cathode	Cold Cathode
Base	Miniature Button-7 Pin
Bulb	T 5½
Max. Overall Height	2 1/8"
Max. Seated Height	1 7/8"
Max. Diameter	3/4"
Mounting Position	any

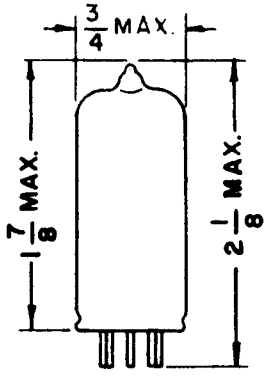
0G3/85A2

NOTES:

1. The tube should be operated only with the cathode negative and the anode positive.
2. Equilibrium conditions are normally reached after 3 minutes of operation.

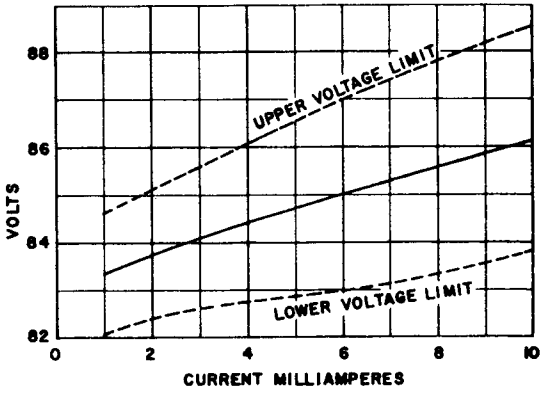
   During life the AC resistance will remain essentially constant, but the temperature coefficient of the operating voltage can be expected to decrease slightly.
3. The greatest constancy of the operating voltage is obtained when the tube is operated at one value of current.
4. The noise of the tube over a frequency band of 30 to 10,000 cycles/sec. is of the order of 60 μV (equivalent noise resistance 22 megohms), and is evenly distributed over the frequency range.
5. The tube should not be subjected to severe shock or continuous vibration.





Basing Connections

Pin 1 - Plate
Pin 2 - Cathode
Pin 3 - Internally Connected
Pin 4 - Cathode
Pin 5 - Plate
Pin 6 - Internally Connected
Pin 7 - Cathode



APPLICATION NOTES

Basically, the OG3 is similar in construction and operation to common voltage regulator tubes such as the OA3 for example. The OA3 is intended to provide a resonably constant D.C. voltage across itself, for varying loads and line voltage, by drawing a compensating current through a voltage dropping resistor. The OG3 is intended as a voltage reference tube and is designed for operating voltage stability over long periods of time.

Especially after a "run-in" period of 300 hours, the voltage across the OG3 remains very constant for a constant current flowing through the tube and compares well with a standard cell in this respect. Instability, such a voltage jumps and oscillations are greatly reduced in this tube. However, this improvement is accompanied by a higher A.C. resistance. The detriment is of little consequence for the application intended since a constant D.C. current is drawn by the tube.

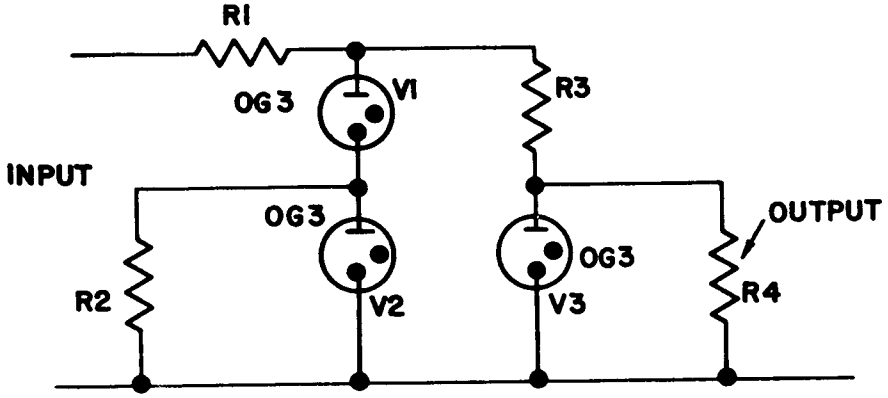


FIGURE 1
ACCURATE D.C. VOLTAGE SOURCE

Fig. 1 shows two OG3's used as regulator tubes, in controlling the input to the OG3 used as a voltage reference tube. This arrangement provides a constant current through the voltage reference tube, thereby providing a very constant 85 volts. This may be tapped off by an accurate voltage dividing network. The resistor R_2 is required to insure firing of V_1 first, followed by the firing of V_2. Parallel operation of the OG3 is not recommended because the tube with the lower striking voltage will take all the load.