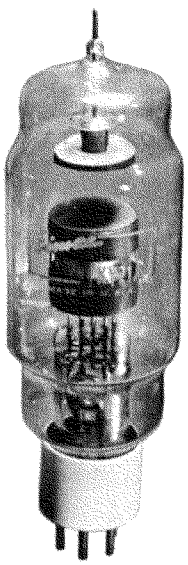
KY21A

GRID-CONTROLLED MERCURY VAPOR RECTIFIER

EITEL-McCULLOUGH, INC.
SAN BRUNO, CALIFORNIA

The Eimac KY21A is a grid-controlled mercury vapor rectifier. A pair of KY21A's in a conventional single phase full wave circuit will supply a d-c power output of 5 kilowatts (3500 volts at 1.5 amperes) with a choke input filter.



GENERAL CHARACTERISTICS

ELECTRICAL	
Filament: Coated	
Voltage	2.5 volts
Current	10 amperes
Filament Heating Time (minimum)	30 seconds
Tube Voltage Drop (average)	15 volts
Ionization Time (approximately)	10 μseconds
Deionization Time (approximately)	1000 μseconds
MECHANICAL	
Base*	Medium, 5 Pin
Basing	See Outline Drawing
Maximum Overall Dimensions	
Length	8.0 inches
Diameter	2.25 inches
Net Weight	5 ounces
Shipping Weight	1 pound
MAXIMUM RATINGS (single tube)	
Peak Inverse Anode Voltage	11,000 max. volts
Peak Forward Anode Voltage	5,500 max. volts
Peak Anode Current	3 max. amperes
Average Anode Current	.75 max. amperes
Supply Frequency	150 max. C.P.S.
Temperature Limits, Condensed Mercury	20° to 60° Centigrade 65° to 140° Fahrenheit

*In order to carry the ten amperes of filament current the adjacent pins have been connected in parallel within the base. Similar connections should be made on the socket.

APPLICATION

MECHANICAL

Mounting—The KY21A must be mounted vertically, base down.

Cooling—Since the cooling of the KY21A is accomplished by radiation and convection, provision should be made for adequate air circulation around the tube. The temperature of the condensed mercury within the KY21A should be maintained at 40 degrees plus or minus 5 degrees Centigrade for best performance. To measure the condensed mercury temperature a thermocouple or small thermometer may be attached to the envelope in the area designated on the outline drawing, using a very small amount of putty.

ELECTRICAL

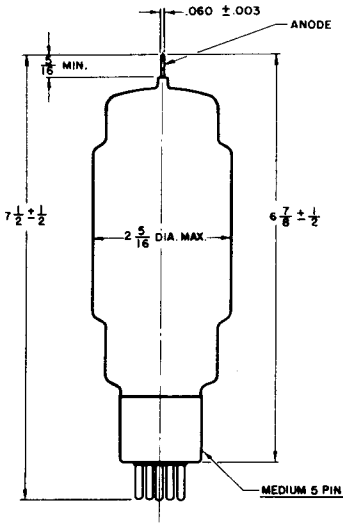
CAUTION SHOULD BE OBSERVED IN MEASURING THE FILAMENT VOLTAGE, AS THE FILAMENT CIRCUIT MAY BE AT A HIGH D-C POTENTIAL.

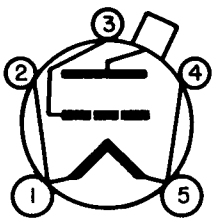
Filament Voltage—For maximum tube life the filament voltage, as measured directly at the filament pins, should be held at the rated value of 2.5 volts. Variations in filament voltage must be kept within the range of 2.4 to 2.6 volts. The filament of the KY21A should be allowed to reach operating temperature before the plate voltage is applied. Under normal conditions, a delay of approximately 30 seconds will be required. Under conditions where the tube is to be operated in extremely cold or extremely warm temperatures some external method of maintaining proper ambient temperature must be provided.

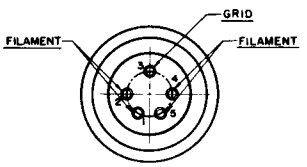
When a KY21A is first installed, the filament should be operated at rated voltage for approximately ten minutes with no plate voltage applied, in order that the mercury may be properly distributed. It will not be necessary to repeat this procedure unless the mercury is spattered on the filament and plate during subsequent handling.

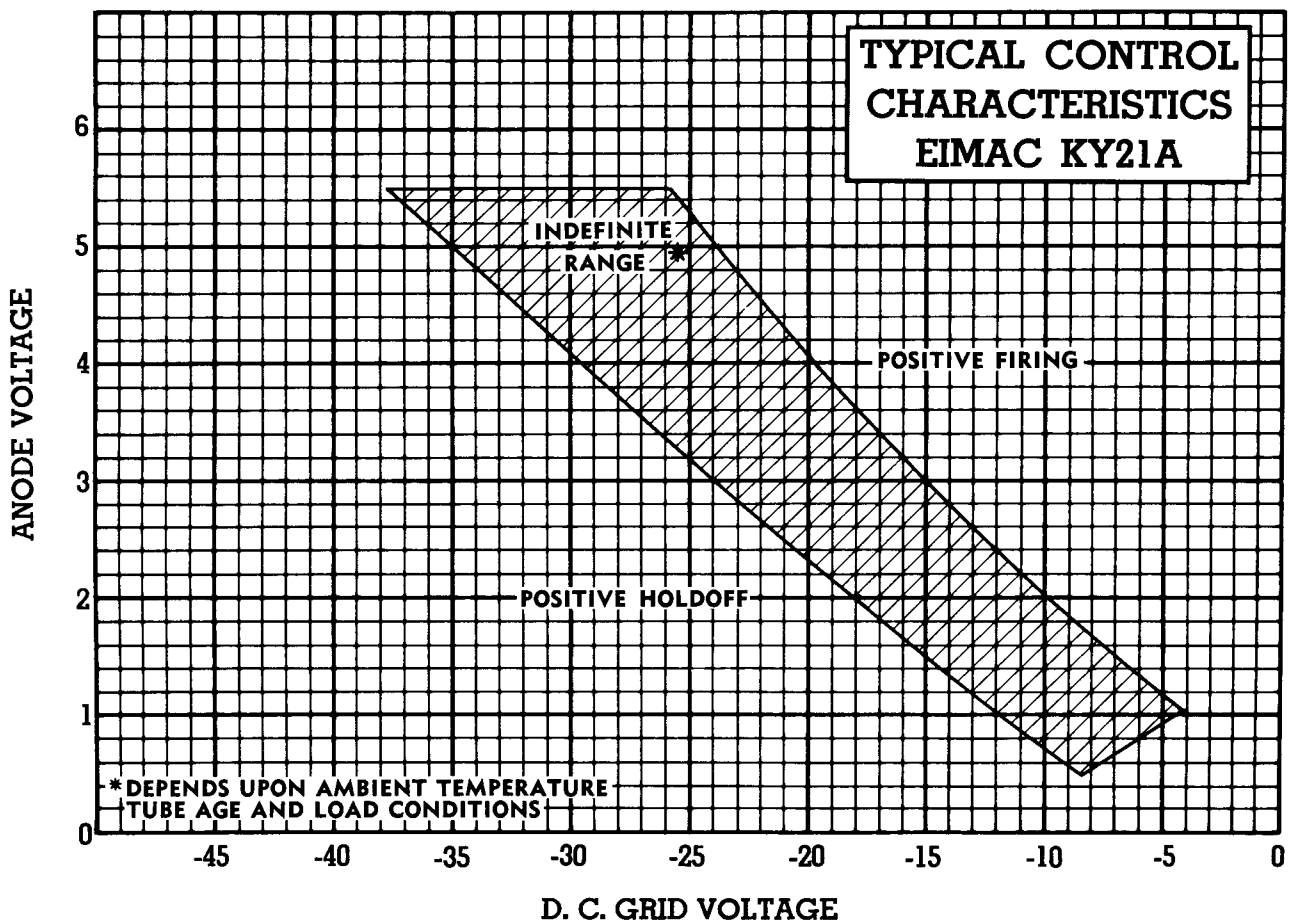
Shielding—Extreme care must be exercised in preventing r-f electromagnetic and electrostatic fields from entering the circuits incorporating the KY21A. Tube "hold-off" characteristics will be materially affected in the presence of r-f fields.

Grid Circuit—The KY21A is prevented from conducting by placing a negative potential on the grid. The relationship between negative grid control voltage and anode voltage is shown in the characteristic curve. The ratio of d-c plate voltage to control voltage varies from about 87:1 at 1000 volts to 130:1 at 3500 volts. The use of slightly higher than the minimum voltage for hold-off is recommended. It may be convenient to supply 100 to 150 volts of bias from a small pack. This grid voltage is satisfactory for all normal plate voltages. It will usually be advisable to protect the grid of the KY21A by means of a current limiting resistor of approximately 10,000 ohms.


.060 ±.003
ANODE
5/16 MIN.
7 1/2 ± 1/2
2 5/16 DIA. MAX.
6 7/8 ± 1/2
MEDIUM 5 PIN BASE


3
2
4
1
5


GRID
FILAMENT
FILAMENT


TYPICAL CONTROL CHARACTERISTICS EIMAC KY21A
INDEFINITE RANGE
POSITIVE FIRING
POSITIVE HOLDOFF
*DEPENDS UPON AMBIENT TEMPERATURE TUBE AGE AND LOAD CONDITIONS
ANODE VOLTAGE
0
1
2
3
4
5
6
-45
-40
-35
-30
-25
-20
-15
-10
-5
0
D. C. GRID VOLTAGE