

GL-8326

HYDROGEN THYRATRON

**33 KILOVOLTS PEAK
100 KILOWATTS AVERAGE POWER**

**CERAMIC ENVELOPE
EXTERNAL ELECTRODES**

The GL-8326 is a hydrogen thyatron for radar-modulating and other pulsing applications. It is capable of switching an average power of 100 kilowatts.

Mechanically, the tube features a heavy-duty ceramic envelope and exter-

nal electrodes to improve heat dissipation.

The high peak power rating of this tube and its mechanical design features assure reliable service under the stringent operating conditions encountered in high-power pulse equipment.

Electrical

	Minimum	Bogey	Maximum	
Cathode—Indirectly Heated				
Cathode is Tied to Heater Midpoint				
Heater Voltage.....	6.0	6.3	6.6	Volts
Heater Current,				
$E_f = 6.3$ volts.....	35	—	55	Amperes
Reservoir				
Heater Voltage.....	3.5	4.5	5.5	Volts
Heater Current.....	—	—	24	Amperes
Heating Time.....	15	—	—	Minutes
Direct Interelectrode Capacitances				
Anode to Grid.....	—	40	—	$\mu\mu\text{f}$
Grid to Cathode.....	—	40	—	$\mu\mu\text{f}$
Anode Current Time Jitter	—	0.005	0.01	Microseconds
Anode Delay Time*	—	—	1	Microsecond
Delay Time Drift†	—	—	0.1	Microsecond
Anode Voltage Drop.....	—	—	400	Volts
Grid Drive‡				

Mechanical

Mounting Position—Vertical with Base Down	
Altitude, maximum.....	10,000 Feet
Net Weight, approximate.....	15 Pounds

Thermal

Ambient Temperature Limits.....	—55 to +75 C
Type of Cooling—Forced Air	
Air Flow Rate, at 40 C Inlet Temperature	
.....	160 Cubic Feet Per Minute
Velocity, minimum.....	2000 Feet per Minute
At higher inlet temperatures increased air flow may be required.	

MAXIMUM RATINGS—ABSOLUTE VALUES

Maximum Peak Anode Voltage		Anode Dissipation Factor§.....	55×10^9
Inverse (See OPERATING NOTES, Electrical)		Maximum Negative Control-Grid	
Forward, minimum supply		Voltage before Conduction.....	650 Volts
voltage = 3500 volts d-c.....	33,000 Volts	Maximum Rate of Rise of	
Maximum Cathode Current		Anode Current.....	10,000 Amperes per Microsecond
Peak.....	4000 Amperes		
Average.....	7.0 Amperes		
Maximum Averaging Time.....	1 Cycle		
RMS¶.....	100 Amperes		

* The time interval between the point on the rising portion of the grid pulse which is 26 percent of the peak unloaded pulse amplitude and the start of the anode current pulse.

† Change in anode delay time relative to the delay time observed after two minutes of operation.

‡ Driver pulse measured at the tube socket with thyatron grid disconnected; amplitude = 1300 volts minimum, 2500 volts maximum, above 0; time of rise = 0.35 microsecond maximum, measured from 26 percent to 70 percent of peak value; grid pulse duration = 2 microseconds minimum, measured between 70 percent of peak on rising side to 70 percent of peak on falling side; impedance of drive circuit = 10 to 25 ohms.

¶ The RMS current of hydrogen thyatrons is the square root of the product of the average and peak currents.

§ Highest rating to which tube has been tested. This is not necessarily maximum tube capability.

GENERAL ELECTRIC

OPERATING NOTES**Thermal**

The optimum reservoir voltage for operation under artificial-cooling conditions at maximum tube voltage, maximum peak and average tube currents, and at a repetition corresponding to an anode dissipation factor of 50×10^9 is inscribed on the base of the tube and must be held within ± 5 percent. Applications involving operation at other conditions may necessitate a redetermination of the optimum reservoir range.

Electrical

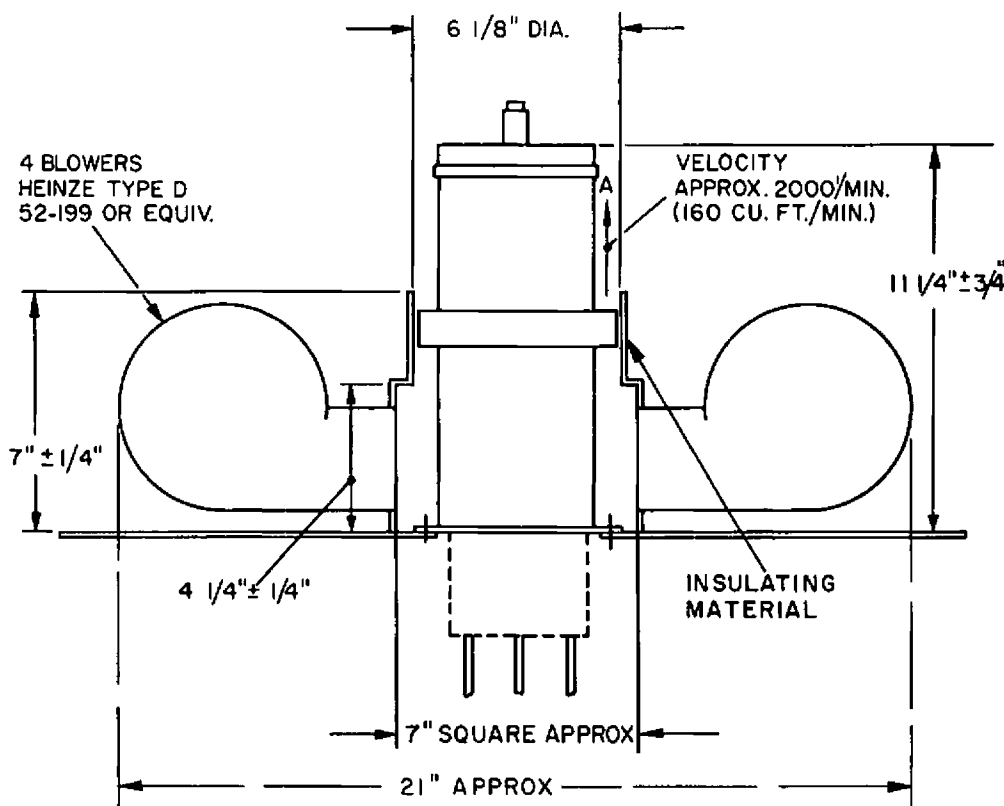
In switching and line-type modulator circuits the minimum inverse anode voltage permissible is 5 percent of the peak forward voltage, and the maximum is 5000 volts during the first 25 microseconds following the anode pulse, exclusive of a spike of 0.05 microsecond maximum duration.

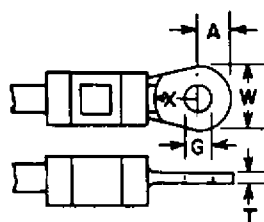
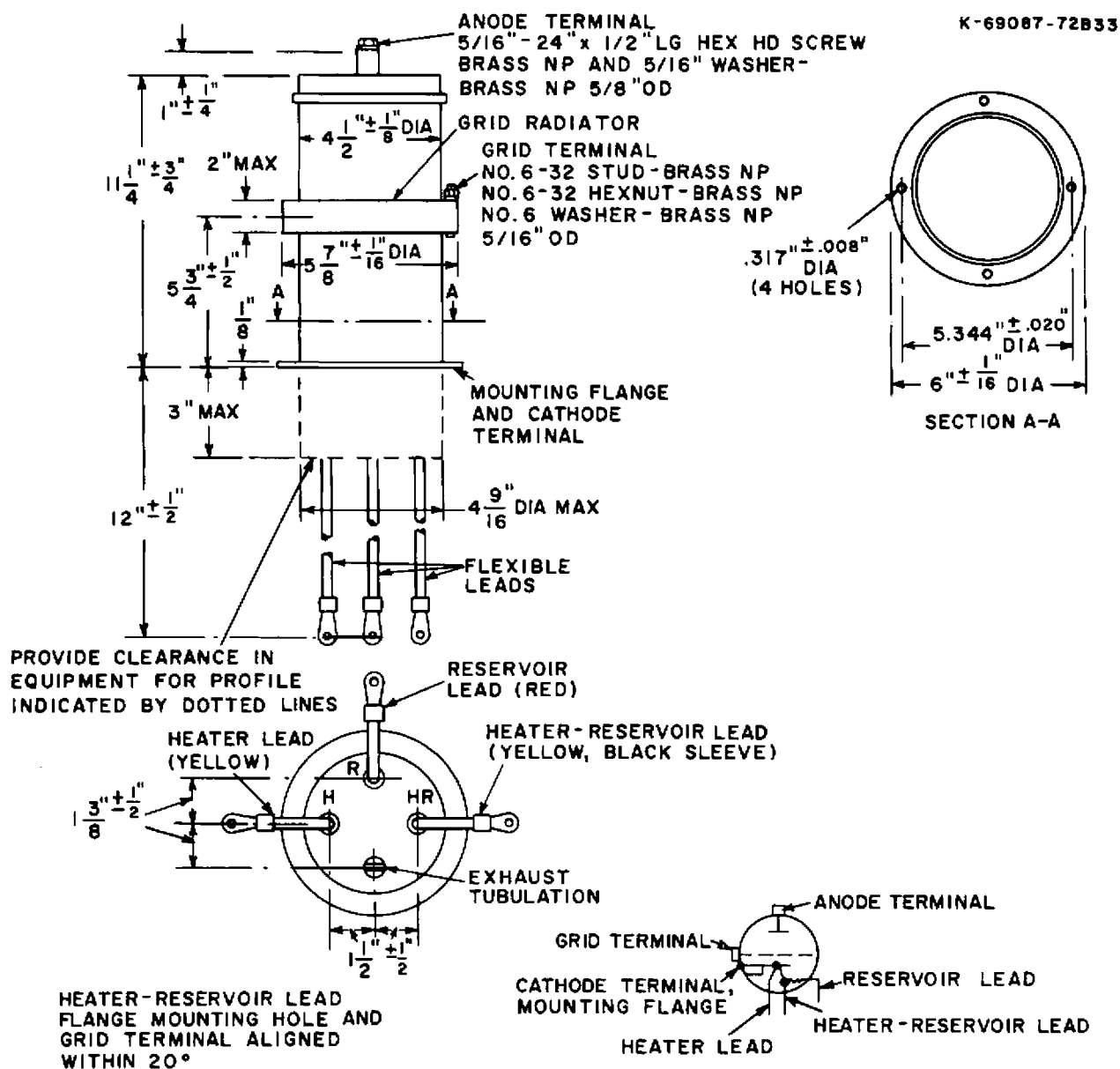
If the forward anode voltage is applied instantaneously, it should be limited to a maximum of 22 kilovolts peak. The power-supply filter should be designed to limit the rate of application of this voltage to 550,000 volts per second.

X-RAY WARNING NOTICE

If the GL-8326 is operated at anode voltages in excess of 16 kilovolts, X-ray radiation shielding may be necessary to protect the user against possible danger of personal injury from prolonged exposure at close range. For further information consult the following references or other standard texts on the subject:

- (a) X-RAY PROTECTION DESIGN, Handbook No. 50. National Bureau of Standards, Washington, D. C.
 - (b) X-RAY PROTECTION, Handbook No. 60. National Bureau of Standards, Washington, D. C.
- The above references are available from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.
- (c) SAFETY CODE FOR THE INDUSTRIAL USE OF X-RAYS, Bulletin No. Z54-1. American Standards Association, New York 17, N. Y.
 - (d) Schneider, S. and Reich, B., "X-Ray Emission from High-Voltage Hydrogen Thyratrons," PROC. IRE, Vol. 43, No. 6, June, 1955.





PRESSURE-TYPE LUGS WITH INSULATING SLEEVES

LEADS	LUG DESIGNATION	"G" INCHES	"W" INCHES	"A" INCHES	"X" INCHES	"T" INCHES
RESERVOIR	NO. 10	.187 TO .207	.395 MAX	.200 MAX	.275 MIN	.060 MAX
HEATER- RESERVOIR	1/4"	.260 TO .313	.605 MAX	.305 MAX	.380 MIN	.060 MAX
HEATER	1/4"	.260 TO .313	.605 MAX	.305 MAX	.380 MIN	.060 MAX

NOTE: THERE SHALL BE NO OBSTRUCTION WITHIN THE DISTANCE OF "X" FROM THE CENTER OF THE LUG SCREW HOLE