ELECTRON TUBE DIVISION
CLIFTON, NEW JERSEY
INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION

KUTHE
8301/KU-275

TENTATIVE

SUPER-POWER CERAMIC HYDROGEN THYRATRON

DESCRIPTION:

The 8301 is a 100 megawatt ceramic hydrogen thyratron. The anode and grid structures may be liquid cooled to permit operation at an average output power level of 200 kilowatts. Special features of the 8301 include a balanced capacity gradient grid design for optimum operation and a maximum planar cathode area for long life. This tube was previously designated by the type number KU-275.

ELECTRICAL DATA, GENERAL	Nom.	Min.	Max.	
Heater Voltage	6.3	6.0	6.6	Volts AC
Heater Current (At 6.3 Volts)		40	100	Amperes
Heater (Note 1)				
Reservoir Voltage (Note 2)		3.5	6.0	Volts
Reservoir Current at 5.5 Volts		20.0	60.0	Amperes
Minimum Heating Time			15	Minutes

MECHANICAL DATA, GENERAL		
Mounting Position	Vertical Only, Base Down	
Base (Per Outline)		Flange
Cooling (Note 3)		
Net Weight	41	Pounds
Dimensions (See Outline Drawing)	Seated Height: 16	Inches

RATINGS:

Max. Peak Anode Voltage, Forward	50.0	Kilovolts
Max. Peak Anode Voltage, Inverse (Note 4)	50.0	Kilovolts
Min. Anode Supply Voltage (Note 5)	5.0	Kilovolts
Max. Peak Anode Current	4000	Amperes
Max. Average Anode Current	8.0	Amperes DC
Max. RMS Anode Current (Note 6)	125	Amperes AC
Max. Epy X ib X prr	400×10^9	
Max. Anode Current Rate of Rise	10,000	Amps./μ Sec.
Peak Trigger Voltage (Note 7)		
Ambient Temperature	-55° to +90°	C

Note 1:

Cathode connected to center of cathode heater.

Note 2:

Reservoir voltage is marked on the base of each 8301. This is the correct voltage for one typical operating condition but is not the optimum value for all types of operation. This value may be used initially in new applications and the optimum value may then be obtained by exploring the range of voltage on either side of that marked on the tube. Excess reservoir voltage will result in a failure of the thyratron to deionize between pulses (continuous conduction). Insufficient reservoir voltage will result in excess anode dissipation as indicated by heating of the anode. The anode dissipation must not be permitted to exceed 2000 watts as measured in the cooling water. A useful formula for this determination follows:

$$P = 264\ QW\ (T_2 - T_1)$$

P	=	Power in Watts
QW	=	Flow in Gallons/Minute
$T_2 - T_1$	=	Outlet and Inlet Water Temperatures in Degrees Kelvin, Respectively

The optimum reservoir voltage is the midpoint between these two extremes. In certain applications it may be necessary to provide a regulated source to assure operation within the permissible range of reservoir voltages.

Note 3:

Cooling of the grid and anode is normally required. This may be accomplished by liquid coolants circulated through the cooling chambers. A minimum flow of 1 gallon per minute of water is required. The water inlet temperature shall not be less than 5°C, nor the outlet temperature higher than 95°C.

Note 4:

During the first 25 microseconds after conduction, the peak inverse anode voltage shall not exceed 10 KV.

Note 5:

A resistance divider of 40 megohms shall be connected between anode and cathode. The center tap of this divider will be connected to the second or gradient grid of the 8301. It is recommended that this arrangement be employed whether low voltage operation is required or not. This divider is a necessity for keyed grid operation.

Note 6:

The root mean square anode current shall be computed as the square root of the product of peak current and the average current.

Note 7:

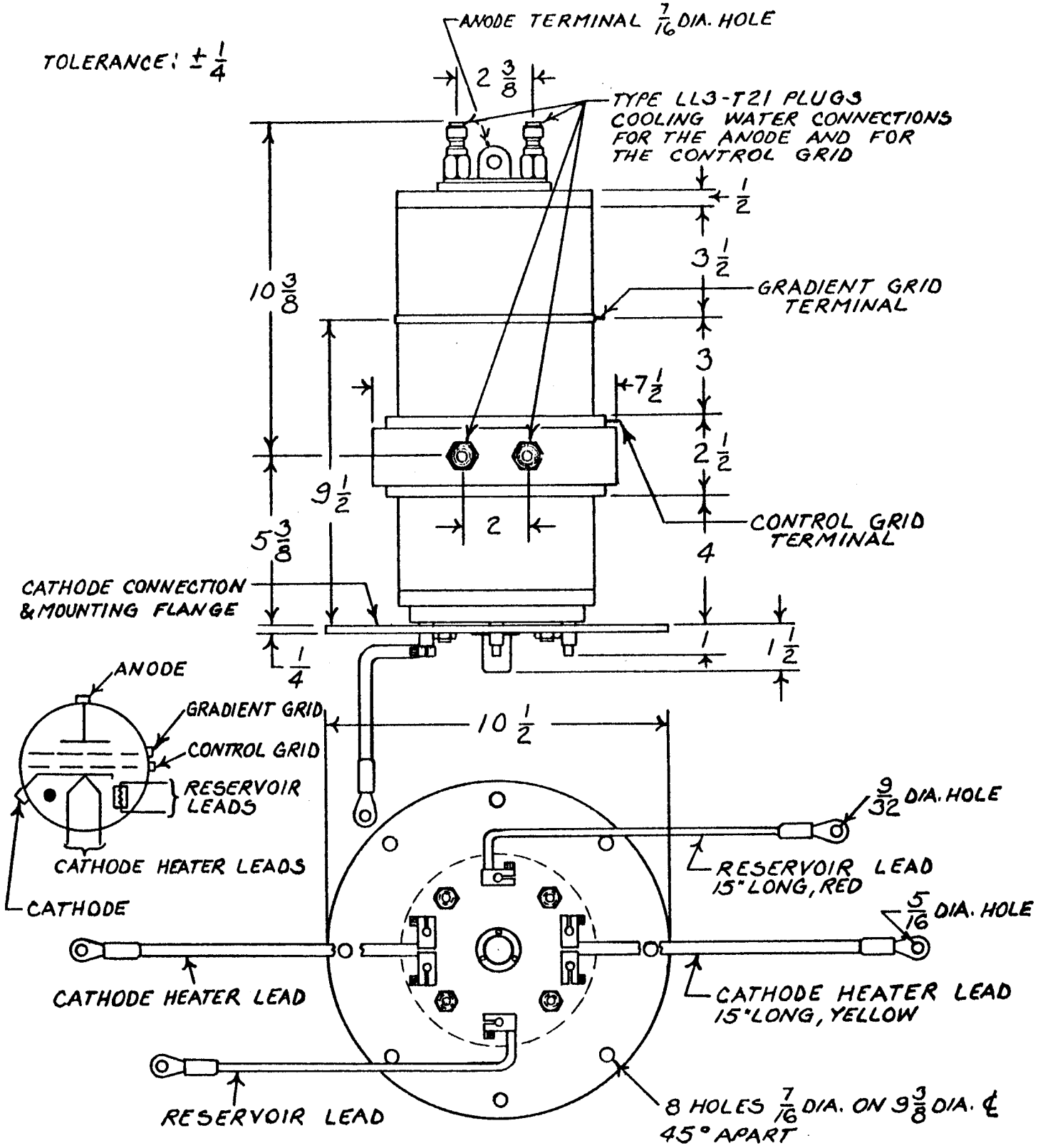
The pulse produced by the driver circuit shall have the following characteristics when viewed at the 8301 socket with the tube removed.

A.	Amplitude	2000 - 4000 Volts
B.	Duration	2 Microseconds (At 70% Points)
C.	Time of Rise	0.35 Microseconds (Min.)
D.	Impedance	10 - 25 Ohms

The limits of anode time delay and anode time jitter are based on the minimum trigger. Using the highest permissible trigger voltage and lowest trigger source impedance materially reduces these values below the limits specified.

Additional information for specific applications can be obtained from the -

Electron Tube Applications Section
ITT Electron Tube Division
Post Office Box 104
Clifton, New Jersey



OUTLINE 8301/KU275