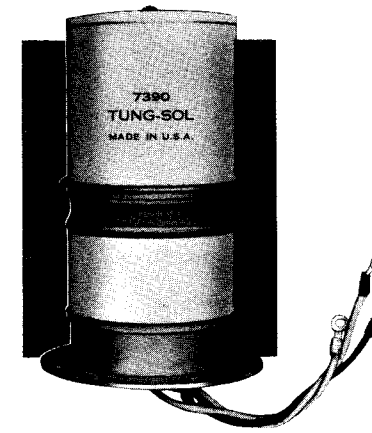
TUNG-SOL

PRODUCT BULLETIN

INDUSTRIAL ELECTRON TUBE TYPE 7390

SEPTEMBER, 1963

CERAMIC HYDROGEN THYRATRON



DESCRIPTION — The 7390 is a ceramic, three element, zero bias hydrogen filled thyratron designed for the generation of high power pulses. The primary application of this tube is in high power, high voltage, radar modulators. In such modulator service, the 7390 is capable of switching a 33 megawatt pulse at an average power of 42 kilowatts. The tube is capable of handling a maximum average power of 66 kilowatts.

The external anode design and ceramic envelope of the 7390 allow operation at high power levels. An externally connected reservoir promotes stable performance and long life by replenishing hydrogen lost by cleanup.

ELECTRICAL DATA

	Min	Bogey	Max	
Heater Voltage	6.0	6.3	6.6	Volts
Heater Current — E_f = 6.3 Volts	22	—	35	Amperes
Reservoir Voltage	3.5	Note 1	5.5	Volts
Reservoir Current — E_f = 4.5 Volts	8	—	10	Amperes
Cathode Heating Time	5	—	—	Minutes
Anode Delay Time	—	—	1.0	Microsecond
Time Jitter — Note 2	—	—	5	Nanoseconds
Anode Voltage Drop	—	—	250	Volts

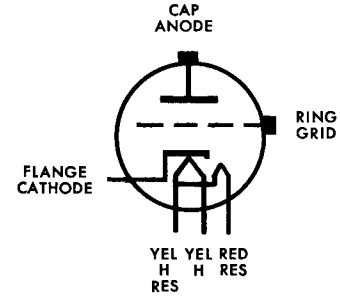
See Page 2 For Outline Drawing

MECHANICAL DATA

Type of Cooling	Convection, see Note 3
Mounting Position	Vertical, base down
Dimensions, Mounting and Terminations	See drawings

RATINGS — ABSOLUTE VALUES

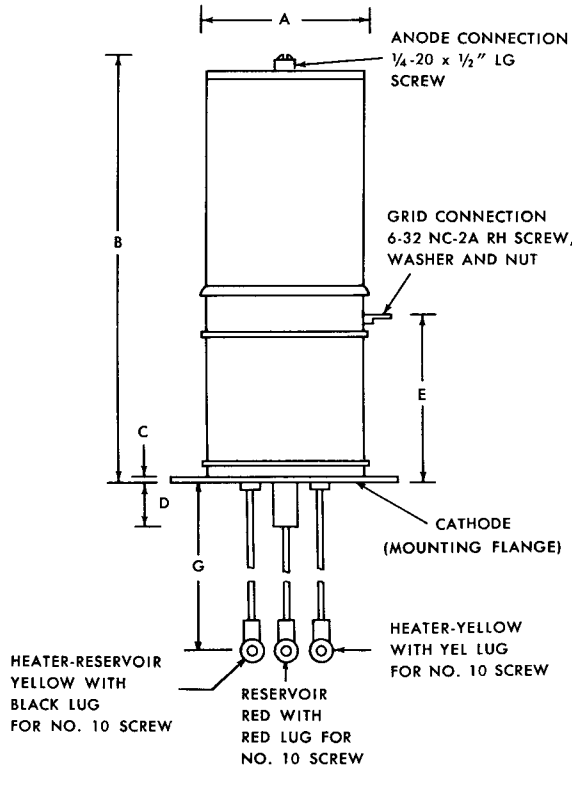
	Min	Max	
Anode Voltage — Peak			
Forward	—	33,000	Volts
Inverse — Note 4	—	33,000	Volts
Cathode Current			
Peak	—	2,000	Amperes
Average	—	4	Amperes
RMS	—	72	Amperes
D-C Anode Voltage	3,500	—	Volts
Grid Voltage — Peak — Note 5	1,300	2,500	Volts
Heating Factor — epy x ib x prr	—	30×10^9	
Current Rate of Rise	—	10,000	Amperes per microsecond
Ambient Temperature	−55	+75	Degrees Centigrade

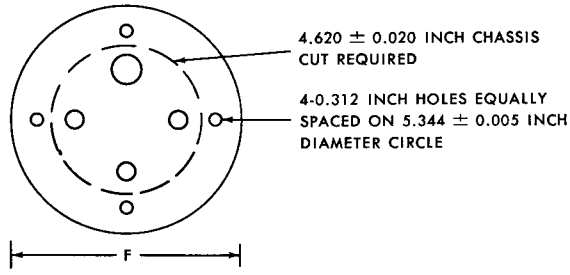


BASING DIAGRAM

NOTES:

1. The optimum reservoir voltage for operation in accordance with operation (1) conditions is inscribed on the base of the tube and must be held within ±2.5 percent. Applications involving other operating conditions will necessitate the redetermination of the optimum reservoir voltage.
2. The time jitter limit as stated is the maximum allowable variation in firing time measured at 50 percent of pulse amplitude after the tube has been operating for at least 60 seconds. To obtain the lowest possible jitter, the tube should be operated above 15 kilovolts with maximum grid trigger voltage, maximum rate of rise of cathode pulse, and minimum values of driver circuit impedance.
3. Maintain grid seal temperature within 225° above ambient temperature by air flow directed at seal and lower ceramic cylinder. Approximately 15 cfm of air is required at rated power levels.
4. In pulsed operation, the peak inverse voltage, exclusive of 0.05 microsecond maximum duration spike, shall not exceed 5 kilovolts during the first 25 microseconds following the pulse.
5. The driver pulse, is measured at the tube socket with tube out of socket. Time of rise equals 0.35 microseconds maximum, pulse duration equals 2.0 microseconds minimum, and driver circuit impedance to be from 10 to 25 ohms.





INCHES

SYMBOL	MIN	MAX
A	—	5.625
B	8.0	10.875
C	0.125	Nominal
D	—	1.25
E	3.75	5.75
F	5.970	6.030
G	9.50	10.50