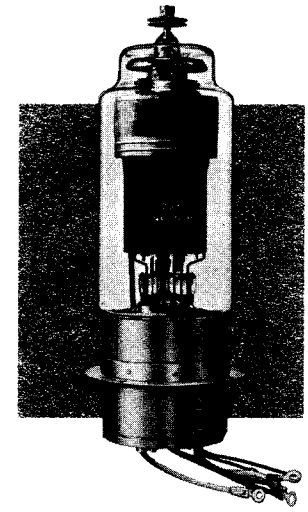
TUNG-SOL

PRODUCT BULLETIN

INDUSTRIAL ELECTRON TUBES TYPE 7559

MARCH, 1963

CROWBAR THYRATRON



—The 7559 is a zero bias hydrogen thyratron designed to pass high currents in "crowbar" protective circuits. As described in the application notes, destructive arc currents are short circuited by the crowbar tube before damage occurs to other tubes or circuit elements.

The instantaneous response, and ability to repeatedly carry extremely large currents, makes the hydrogen thyratron particularly attractive for this application. One type 7559 can handle a peak current of 1500 Amperes at 25 Kilovolts. This tube contains a hydrogen reservoir which promotes long life and permits optimum gas pressure adjustment for various conditions of operation.

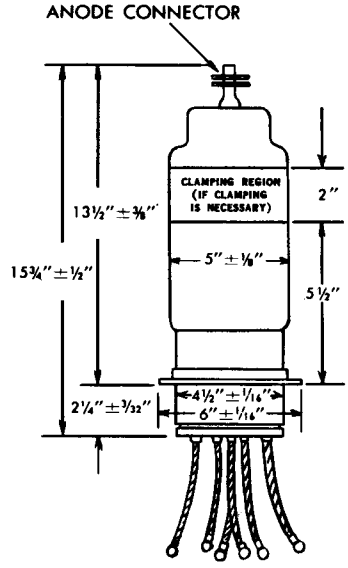
This tube was designed into some circuits under development type designation CH1096.

ELECTRICAL DATA

	Min	Bogey	Max	
Cathode Heater Voltage	6.0	6.3	6.6	Volts
Cathode Heater Current (at Ef = 6.3 volts)	27	30	33	Amperes
Cathode Heating Time	3	—	—	Minutes
Reservoir Voltage	2.5	Marked on base	5.5	Volts
Reservoir Current	—	—	6.5	Amperes
Reservoir Heating Time	3	—	—	Minutes

MECHANICAL DATA

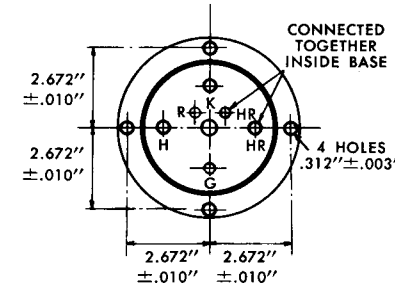
Type of Cooling	Convection
Max Net Weight	4⅝ pounds
Mounting Position	Vertical, Base down
Dimensions: See outline drawings	



OUTLINE DRAWING

MAXIMUM RATINGS — ABSOLUTE VALUES

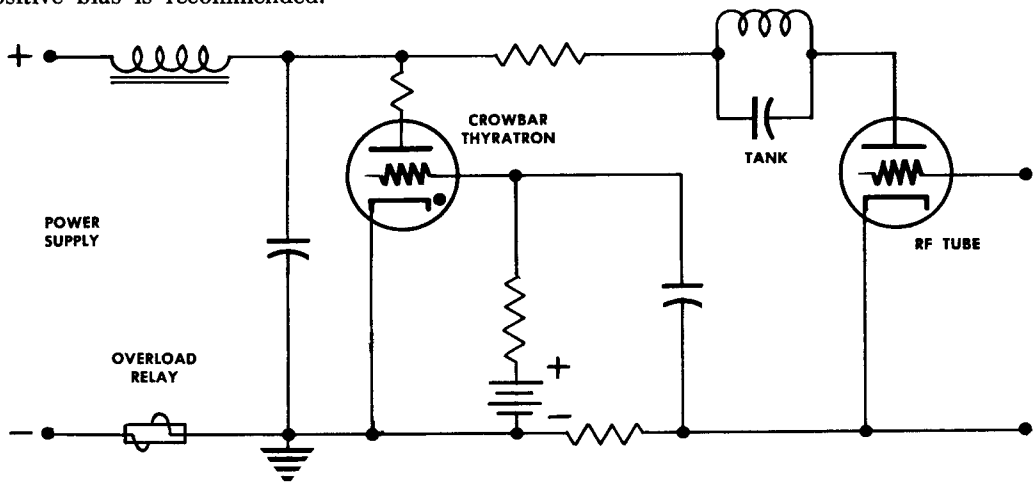
	Min	Max	
D-C Anode Voltage			
Forward	5	25	Kilovolts
Inverse	—	15	Kilovolts
Cathode Current			
Peak			
Filter discharge period			
0 to 1.5 Milliseconds	—	1500 or 1.0	Amperes Coulomb
Rectifier short circuit period			
1.5 to 100 Milliseconds	—	50	Amperes
1.5 to 50 Milliseconds	—	100	Amperes
1.5 to 30 Milliseconds	—	170	Amperes
Average	—	1	Ampere
Conduction Time per Fault	—	0.1	Second
Averaging Time	—	10	Seconds
Recovery Time	—	75	Microseconds
D-C Grid Bias	+100	+200	Volts
D-C Grid Bias Current	5	10	Milliamperes
Grid Signal Voltage	1000	2500	Volts
Grid Impedance	50	200	Ohms
Grid Voltage Rate of Rise	1800	—	Volts per microsecond
Anode Delay Time	—	0.6	Microsecond
Anode Voltage Drop	50	300	Volts
Ambient Temperature Range	−55	+75	Degrees Centigrade



BOTTOM VIEW

APPLICATION NOTES

In a typical application, a crowbar thyratron is connected in series with a suitable impedance across the filter of the high voltage power supply for a high frequency triode amplifier. Whenever an arc occurs in the amplifier tube, the rising current is used to deliver a suitable signal to the grid of the thyratron. The thyratron immediately conducts to short circuit the power supply until the protective circuit breaker opens approximately 0.1 second later. To insure minimum anode delay time, positive bias is recommended.



References:

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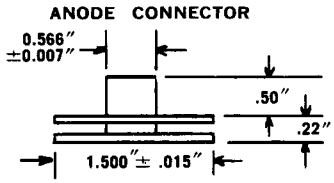
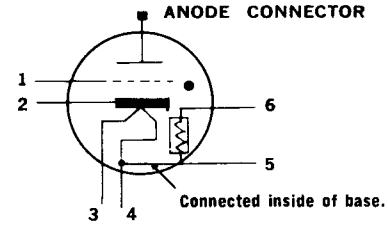


LEAD CONNECTIONS

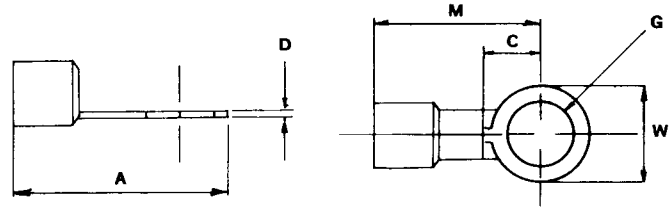
Lead	Function	Lead Color	Lug Color	Lug
1	Grid	Green	Green	S
2	Cathode & Heater C-T	Black	Black	L
3	Heater	Yellow	Yellow	L
4	Heater	Yellow	Black	L
5	Reservoir	Red	Yellow	S
6	Reservoir	Red	Red	S

Leads are flexible 5½″ ±½″ long from bottom of base to center of lug hole. Color coding as well as base marking identifies the leads.

BASING CONNECTIONS



LUG DIMENSIONS



LUG	G STUD	A MAX.	W MAX.	C MIN.	D	M MAX.
L	¼″	1.21″	.53″	.41″	.04″	.94″
S	#10	.90″	.31″	.30″	.03″	.74″