

CERAMIC-METAL
HYDROGEN THYRATRONS

CERAMIC METAL HYDROGEN THYRATRON TECHNICAL DATA

REFERENCE CHART

TYPE		APPLICABLE SPECIFICATIONS	MIL APPROVAL	ABSOLUTE MAXIMUM RATINGS						HEATERS				GRID DRIVE		APPROX. DIMENSIONS		MOUNTING	
NOTE 1 EIA #	EG&G #			po (Mw)	epy (kv)	ib (a)	Ib (Adc)	Ip (Aac)	Pb (x 10 ⁹)	Ef (Vac)	If (Aac) @Ef = 6.3 Vac	Eres (Vac)	Ires (Aac) @Eres = 6.3 Vac	tk (Secs)	egy (v) (min)	Zg (Ohm) (max)	Seated Height (Inches)	Diameter (Inches)	EG&G
	7621 HY-2	MIL-E-1 1428 (Navy)	Yes	.350	8.0 NOTE 2	100	0.1	2.0	2.7	5.8 - 6.8	NOTE 3	5.8 - 6.8	NOTE 3	30	175	1200	1.550	1.150	Cathode Tube Flange
	8613 HY-1A	NOTE 4 MIL-E-1 1590 (Navy)	Yes	5.0	20.0	500	0.5	8.0	10	5.8 - 6.8	5.5 - 7.5	5.8 - 6.8	1.0 - 4.0	180	150	500	5.000	2.375	4 Pin, Super- Jumbo Base, A4-18 Att'd
	7620 HY-10	NOTES 5,9 MIL-E-1 1612 (Navy)	None	5.0	20.0	500	0.5	8.0	10	5.8 - 6.8	5.5 - 7.5	5.8 - 6.8	1.0 - 4.0	180	200	500	3.500	2.250	Cathode Tube Flange
---	HY-11	NOTES 6,8 EG&G BA#2563	None	5.0	20.0	500	0.5	8.0	10	5.8 - 6.8	5.5 - 7.5	5.8 - 6.8	1.0 - 4.0	180	200	500	2.375	2.250	Cathode Tube Flange
	7322 1802	MIL-E-1 1371B	Yes	20	25.0	1500	2.2	47.5	50	5.8 - 6.8	11.0 - 18.0	5.8 - 6.8	3.0 - 6.0	300	450	400	4.145	3.430	MT-4
	7322 ---	MIL-E-1 1371B	Yes	12.5	25.0	1000	2.0	36.0	25	5.8 - 6.8	11.0 - 22.0	5.8 - 6.8	3.0 - 6.0	300	450	400	4.145	3.430	MT-4
	8354 HY-31	MIL-E-1 1426 (Navy)	Yes	12.5	25.0	1000	2.2	40.0	25	5.8 - 6.8	11.0 - 18.0	5.8 - 6.8	3.0 - 8.0	300	450	200	4.145	3.430	MT-4
---	HY-32	EG&G #BA2543	None	20	35	1000	2.2	40.0	50	5.8 - 6.8	11.0 - 18.0	5.8 - 6.8	3.0 - 6.0	300	450	400	4.145	3.430	MT-4
	8614 HY-5	NOTES 7,8 EG&G #A-207718	None	100	40.0	5000	8	125.0	160	6.0 - 6.6	30.0 - 40.0	4.2 - 4.8	10.0 - 15.0 @Eres = 4.5 Vac	900	1300	100	5.375	4.500	Cathode Tube Flange
	7782 HY-6	NOTE 9 EG&G BA #2567	None	2.8	16.0	350	0.5	6.5	5	5.8 - 6.8	3.5 - 7.0	5.8 - 6.8	1.0 - 2.5	180	150	1500	1.938	1.375	Cathode Tube Flange
	7665 HY-60	MIL-E-1 1485 (Navy)	Yes	2.8	16.0	350	0.5	6.5	5	5.8 - 6.8	3.5 - 7.0	5.8 - 6.8	1.0 - 2.5	180	150	1500	2.438	1.375	Cathode Tube Flange
---	HY-61	NOTE 10 EG&G A205528	None	2.8	16.0	350	0.5	6.5	5	5.8 - 6.8	3.5 - 7.0	5.8 - 6.8	1.0 - 2.5	180	150	1500	3.60	1.400	4 pin, medium base, A4-9 Att'd

- NOTES 1 Electronic Industries Association Registered type number.
 2 7621/HY-2 has operated successfully at epy = 10 kv.
 3 Reservoir internally connected - total heater current (If) range (at Ef = Eres = 6.3 Vac) = 2.2 - 3.5 Aac
 4 Exact mechanical and electrical replacement for glass tube types 5C22 and 6587.
 5 Same as 7620/HY-1 but supplied with cathode mounting flange and grid tab connector; Replaces HY-1.
 6 Same as HY-10 but shorter in seated height by approximately 1 inch.
 7 HY-5 has already operated successfully up to 45 kv at specific operating conditions.
 8 approved by Hughes Aircraft Co.
 9 approved by Goodyear Aerospace Corp.
 10 approved by Norden, Division of United Aircraft Corp.

DEFINITION OF ABBREVIATIONS - MIL-E-1 SYSTEM*

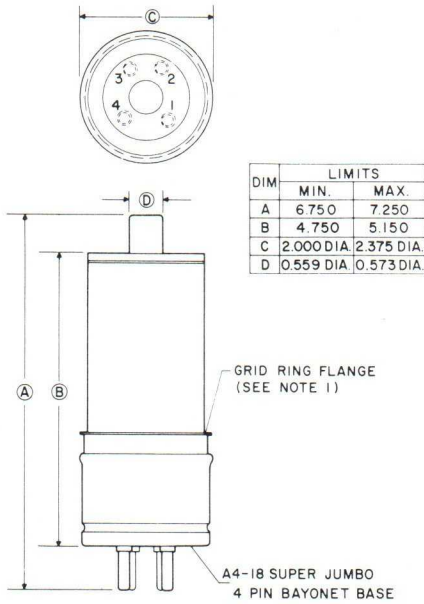
- | | | | |
|-----|---|------|--|
| po | - peak power output | Eres | - Reservoir Heater Voltage |
| epy | - peak forward anode voltage | If | - Cathode Heater Current |
| ib | - peak anode current | Ires | - Reservoir Heater Current |
| Ib | - DC average current (= Duty Cycle x ib) | tk | - cathode and reservoir conditioning time before application of high voltage |
| Ip | - rms value of plate current (= $\sqrt{Ib \times ib}$) | egy | - peak forward grid voltage |
| Pb | - Plate breakdown factor (= epy x prr x ib) | Zg | - Impedance of grid circuit |
| Ef | - Cathode Heater Voltage | | |

* (LOWER CASE LETTERS ARE PEAK VALUES AND UPPER CASE LETTERS ARE AVERAGE VALUES.)

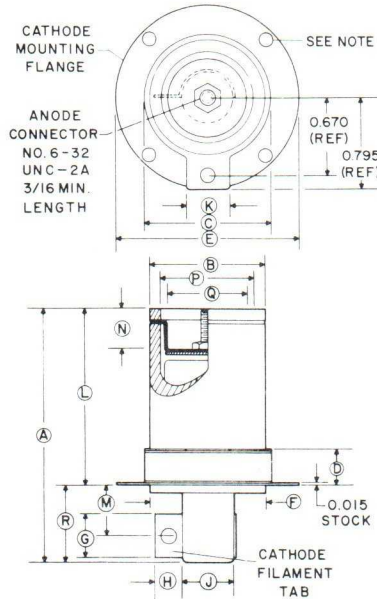
EG&G CERAMIC TO METAL THYRATRONS

General Notes:

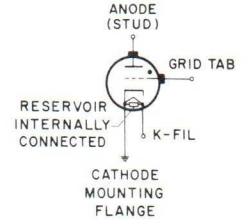
1. All dimensions are in inches unless otherwise specified.
2. Do not use metal clamps on ceramic envelope.



DIM	LIMITS	
	MIN.	MAX.
A	6.750	7.250
B	4.750	5.150
C	2.000 DIA	2.375 DIA
D	0.559 DIA	0.573 DIA



DIM	LIMITS	
	MIN.	MAX.
A	—	2.355
B	0.985 DIA	1.015 DIA
C	—	1.150 DIA.
D	0.295	0.340
E	1.579 DIA.	1.639 DIA.
F	0.985 DIA	1.015 DIA.
G	—	0.500
H	—	0.438
J	—	0.469 DIA.
K	0.250	0.500
L	1.500	1.600
M	0.335	0.585
N	0.250	0.360
P	0.785	0.815
Q	0.650 DIA	0.710 DIA
R	—	0.700

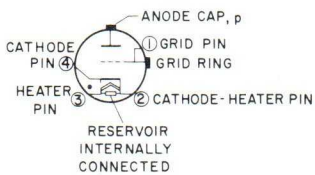


NOTES:

1. 4 MOUNTING HOLES EQUALLY SPACED ON 17/16" DIA BOLT CIRCLE
2. ALL MOUNTING HOLES, INCLUDING GRID AND FIL TAB HOLES CLEAR NO. 4 (.120 DIA.) SCREWS

CONNECTIONS:

PIN NO.: 1 2 3 4 CAP
ELEMENT: g h h k p
k



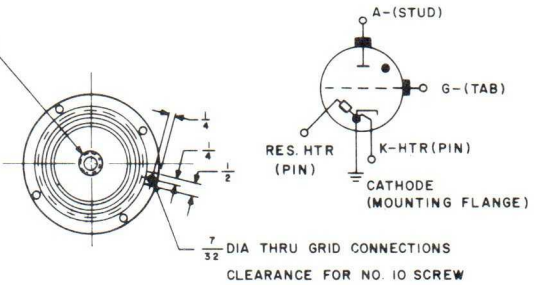
NOTES:

1. THIS FLANGE IS MECHANICALLY AND ELECTRICALLY CONNECTED TO THE GRID, PIN NO. 1
2. RECOMMENDED ANODE CONNECTOR-LIGHTWEIGHT SPRING-CLIP TYPE (NATIONAL CO. TYPE 12 OR EQUAL)

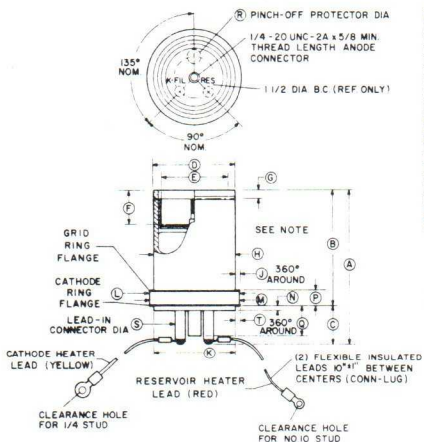
THYRATRON 8613/HY-1A

NO. 10-32 UNF-3A X 5/8" MIN. THREAD LENGTH ANODE CONNECTOR

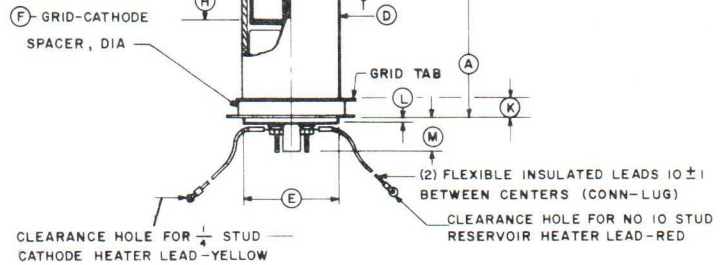
Ltr	DIMENSIONS	
	MIN	MAX.
A	3.370	3.625
D	1.970 DIA	2.030 DIA
E	1.970 DIA	2.030 DIA
F	2.220 DIA	2.280 DIA
G	1.560 DIA	1.680 DIA
H	0.965	1.085
K	0.450	0.550
L	0.050	0.150
M	—	1.085
Q	—	0.225
R	—	0.469 DIA
S	3.200	3.300



THYRATRON 7621/HY-2



DIM	LIMITS	
	MIN.	MAX.
A	—	5.895
B	3.945	4.340
C	—	1.555
D	—	2.430 DIA
E	2.410 DIA	2.530 DIA
F	0.980	1.355
G	—	0.315
H	2.985 DIA	3.015 DIA
J	0.093	—
K	2.985 DIA	3.015 DIA
L	3.235 DIA	3.265 DIA
M	3.245 DIA	3.305 DIA
N	0.100	0.180
P	0.520	0.570
Q	—	1.081
R	—	0.469 DIA
S	—	0.375 DIA
T	0.093	—



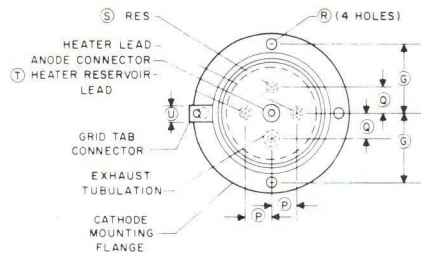
NOTES:

1. DIM A - FOR HY-II IS 2.312 (MIN.) - 2.475 (MAX.)
DIM H - FOR HY-II IS 0.500 (MIN.) - 0.650 (MAX.)
2. HY-II ANODE CONNECTOR IS NO. 10-32 UNF-2A X 3/16" MIN THREAD LENGTH

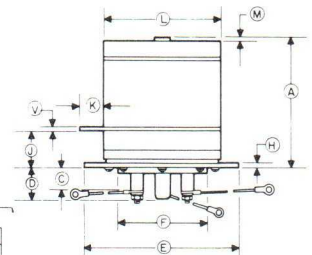
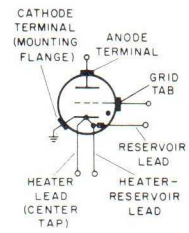
THYRATRONS 7620/HY-10, AND HY-11

THYRATRONS 7322/1802, 8354/HY-31 AND HY-32

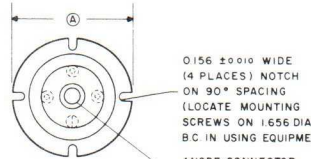
THYRATRON 8614/HY-5



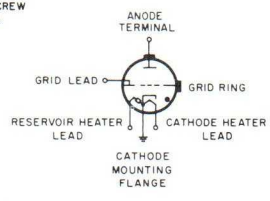
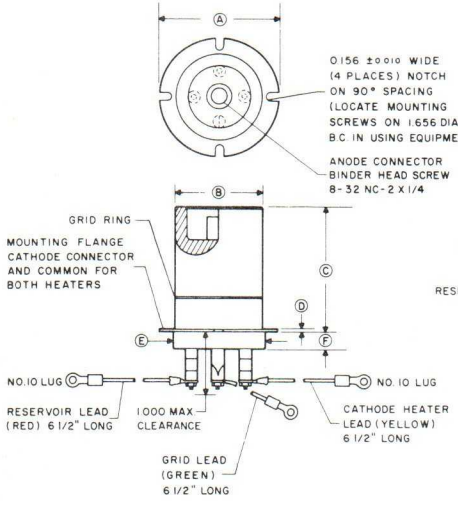
DIM	LIMITS	
	MIN	MAX
A	4.750	5.500
C	0.750	1.250
D	—	2.000
E	5.938 DIA	6.063 DIA
F	—	3.600 DIA
G	2.662	2.682
H	—	0.150
J	1.437	1.687
K	0.125	0.750
L	4.375 DIA	4.625 DIA
M	—	0.375
P	0.844	0.937
Q	0.844	0.937
R	0.309 DIA	0.315 DIA
S	5000 CM	—
T	10,000 CM	—
U	0.437	0.625
V	0.015	0.030



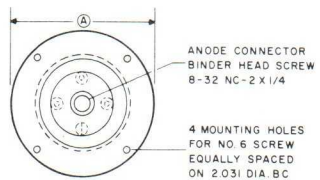
- NOTES
1. ANODE TERMINAL TAPPED FOR 1/4 - 20 NC MACHINE SCREW 1/2" LONG
 2. GRID TERMINAL DRILLED NO.28 (0.140) FOR CLEARANCE HOLE 6-32 NC X 1/2" (MAX) LENGTH
 3. FLEXIBLE LEAD SINGLE LEADS-10" LENGTHS TERMINALS RING TONGUE OR SPADE (OPTIONAL) COMPRESSION TYPE WITH INSULATION SLEEVES. COLOR CODE H (HEATER) = YELLOW, H-R (HEATER-RESERVOIR) = YELLOW, R (RESERVOIR) = RED. LUG SIZE NO. 10 SCREW
 4. DIMENSIONS "D" AND "F" DEFINE CLEARANCE REQUIREMENT BELOW MOUNTING FLANGE TO BE PROVIDED WITH EQUIPMENT
 5. RING TONGUE OR SPADE TERMINALS TO BE STAMPED H (HEATER), H-R (HEATER-RESERVOIR) AND R (RESERVOIR)



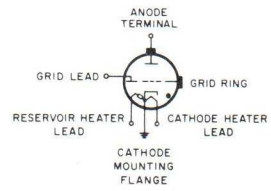
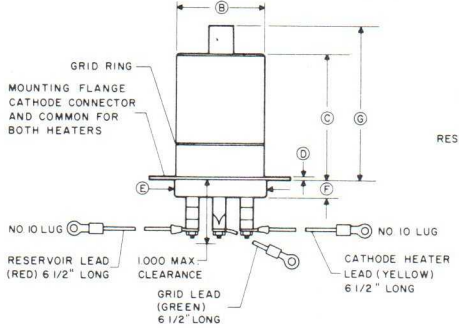
DIM	LIMITS	
	MIN	MAX
A	1.865 DIA	1.885 DIA
B	1.365 DIA	1.385 DIA
C	1.875	2.000
D	—	0.030
E	—	1.437
F	—	0.279



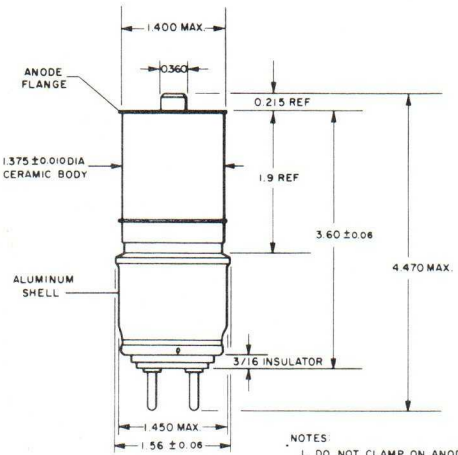
THYRATRON 7782/HY-6



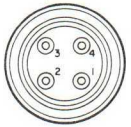
DIM	LIMITS	
	MIN	MAX
A	—	2.250 DIA
B	1.365 DIA	1.385 DIA
C	1.875	2.000
D	—	0.030
E	—	1.437
F	—	0.279
G	2.406	2.468



THYRATRON 7665/HY-60

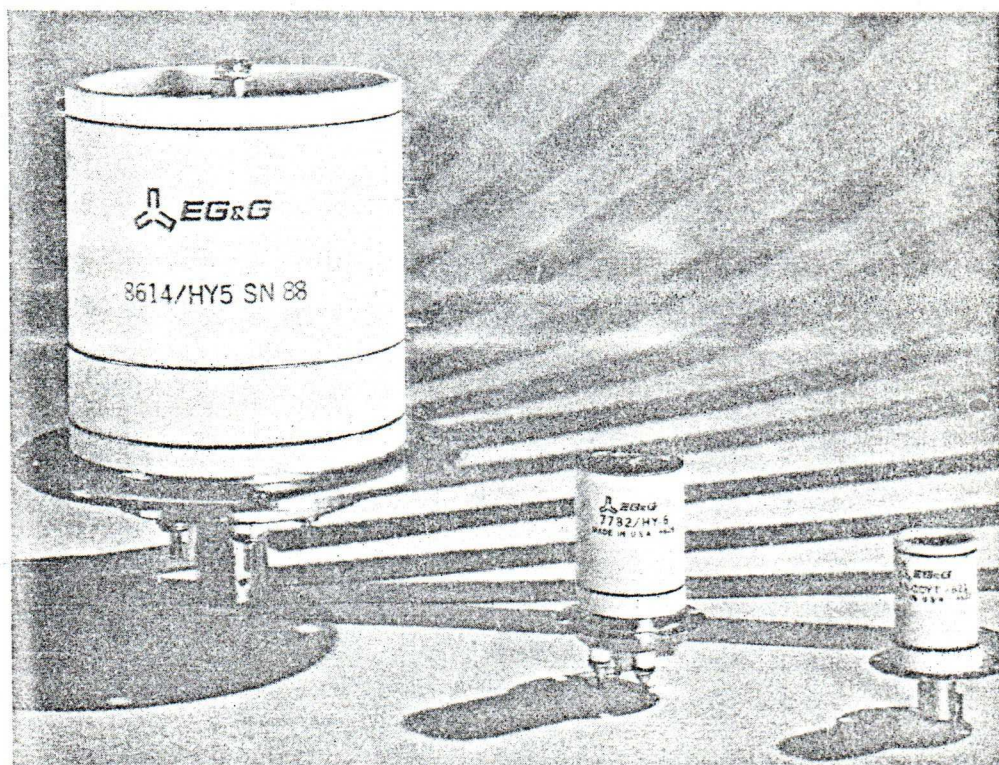


- NOTES
1. DO NOT CLAMP ON ANODE FLANGE
 2. ALUMINUM SHELL IS ELECTRICALLY CONNECTED TO CATHODE
 3. PIN CONFIGURATION AND SIZE TO BE THE SAME AS FOR A STANDARD MEDIUM 4-PIN BASE SUCH AS AA-9 PER MIL-E-1.



THYRATRON HY-61

All Data and Specifications Subject to Change Without Notice



CERAMIC-METAL
HYDROGEN THYRATRONS

CERAMIC-METAL HYDROGEN THYRATRON TECHNICAL DATA REFERENCE CHART

TYPE		APPLICABLE SPECIFICATIONS	MIL APPROVAL	ABSOLUTE MAXIMUM RATINGS					
NOTE 1 EIA No.	EG&G No.			Po (Mw)	epy (kv)	ib (a)	Ib (Adc)	Ip (Aac)	Pb (x 10 ⁹)
7621	HY-2	MIL-E-1 1428	Yes	.350	8 ^{Note 2}	100	0.1	2.0	2.7
None	HY-26	EG&G A-307131	Note 11	1.0	12	175	0.15	4.0	5
7782	HY-6	MIL-E-1 1636	Yes	2.8	16	350	0.5	6.5	5
7665A	HY-60	MIL-E-1 1485	Yes	2.8	16	350	0.5	6.5	5
None	HY-61	EG&G A210505	Note 10	2.8	16	350	0.5	6.5	5
8765	HY-63	MIL-E-1 1661	Yes	2.1	12	350	0.5	6.5	5
None	HY-6301	EG&G B309034	Note 9	2.8	12	350	0.5	6.5	5
None	HY-6302	EG&G A309638	Note 5	2.8	12	350	0.5	6.5	5
8613	HY-1A	MIL-E-1 1590	Note 4 Yes	5.0	20	500	0.5	8.0	10
7620	HY-10	MIL-E-1 1612	-----	5.0	20	500	0.5	8.0	10
None	HY-11	EG&G A2563	Notes 6,8	5.0	20	500	0.5	8.0	10
7322	1802	MIL-E-1 1371	Note 12 Yes	20	25	1500	2.2	47.5	50
8354	HY-31	MIL-E-1 1426	Note 12 Yes	20	25	1000	2.2	40.0	25
None	HY-32	EG&G A2543	Note 12	20	35	1500	2.2	47.5	50
8614	HY-5	EG&G A207718	Notes 7,8	100	40	5000	8.0	125.0	160

- NOTES
- 1 Electronic Industries Association Registered type number.
 - 2 7621/HY-2 has operated successfully at epy = 10 kv.
 - 3 Reservoir internally connected.
 - 4 Exact mechanical and electrical replacement for glass tube types 5C22 and 6587.
 - 5 Used in Bendix RDR-1 weather radar.
 - 6 Same as HY-10 but shorter in seated height by approximately 1 inch.
 - 7 HY-5 has operated successfully up to 45 kv at specific operating conditions.
 - 8 Approved by Hughes Aircraft Co.
 - 9 Used in RCA AVQ-10 weather radar.
 - 10 Approved by Norden, Division of United Aircraft Corp.
 - 11 Approved by Texas Instruments.
 - 12 Use EG&G MT-4 Tube Mount (Data Sheet No. H5001).
 - 13 TM-27 Trigger module is recommended for all thyratrons except 8614/HY-5 which requires EG&G TM-29 Trigger module.

HEATERS					GRID DRIVE	
Ef (Vac)	If (Aac) Ef = 6.3Vac	Eres (Vac)	Ires (Aac) Eres = 6.3Vac	tk (Secs)	egy Note 13	Zg
5.8-6.8	2.2-3.5	Note 3	Note 3	90	175	1200
5.8-6.8	2.0-4.5	Note 3	Note 3	90	175	1200
5.8-6.8	3.5-7.0	5.8-6.8	1.0-2.5	180	150	1500
5.8-6.8	3.5-7.0	5.8-6.8	1.0-2.5	180	150	1500
5.8-6.8	5.5-8.5	Note 3	Note 3	180	150	1500
5.8-6.8	5.5-8.5	Note 3	Note 3	180	150	1500
5.8-6.8	5.5-8.5	Note 3	Note 3	180	150	1500
5.8-6.8	5.5-8.5	Note 3	Note 3	180	150	1500
5.8-6.8	6.0-11.5	Note 3	Note 3	180	175	500
5.8-6.8	5.5-7.5	5.8-6.8	1 - 4	180	200	500
5.8-6.8	5.5-7.5	5.8-6.8	1 - 4	180	200	500
5.8-6.8	11 - 18	5.8-6.8	3 - 6	300	450	400
5.8-6.8	11 - 18	5.8-6.8	3 - 6	300	450	400
5.8-6.8	11 - 18	5.8-6.8	3 - 6	300	450	400
5.8-6.8	20 - 30	4.0-5.0	5 - 11 @ Eres=4.5Vac	900	1300	100

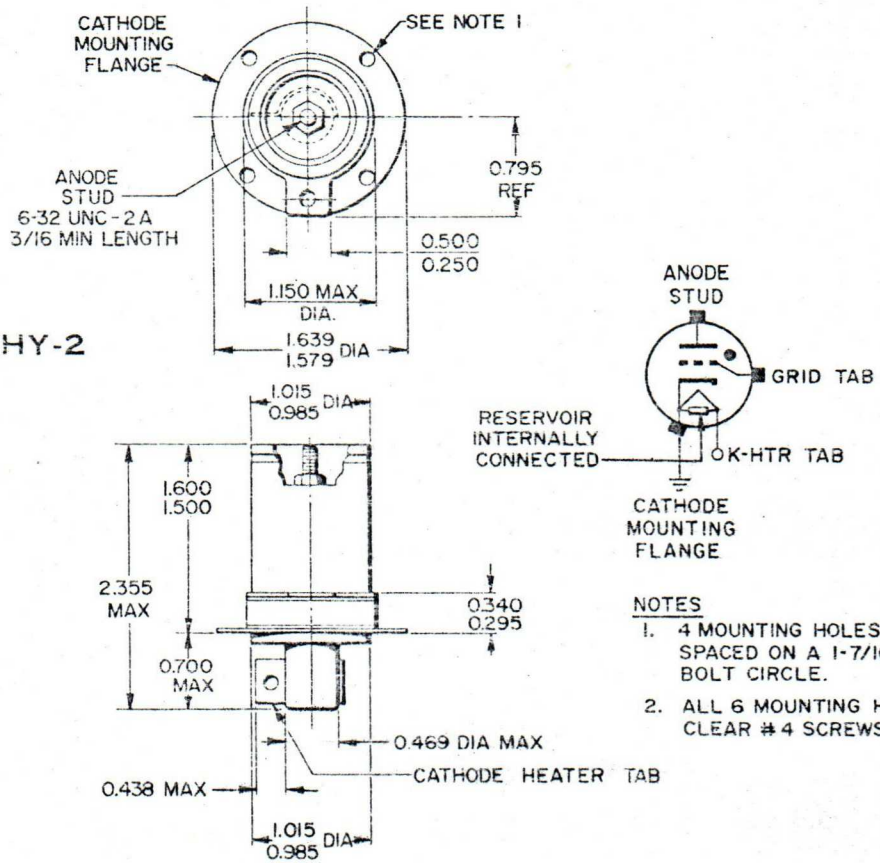
DEFINITION OF ABBREVIATIONS - MIL-E-1 SYSTEM*

- | | | | |
|-----|---|------|--|
| po | - peak power output | Eres | - Reservoir Heater Voltage |
| epy | - peak forward anode voltage | If | - Cathode Heater Current |
| ib | - peak anode current | Ires | - Reservoir Heater Current |
| ib | - DC average current (= Duty Cycle x i_b) | tk | - cathode and reservoir conditioning time before application of high voltage |
| lp | - rms value of plate current (= $\sqrt{i_b \times i_b}$) | egy | - peak forward grid voltage |
| Pb | - Plate breakdown factor (= $epy \times prr \times ib$) | Zg | - Impedance of grid circuit |
| Ef | - Cathode Heater Voltage | | |

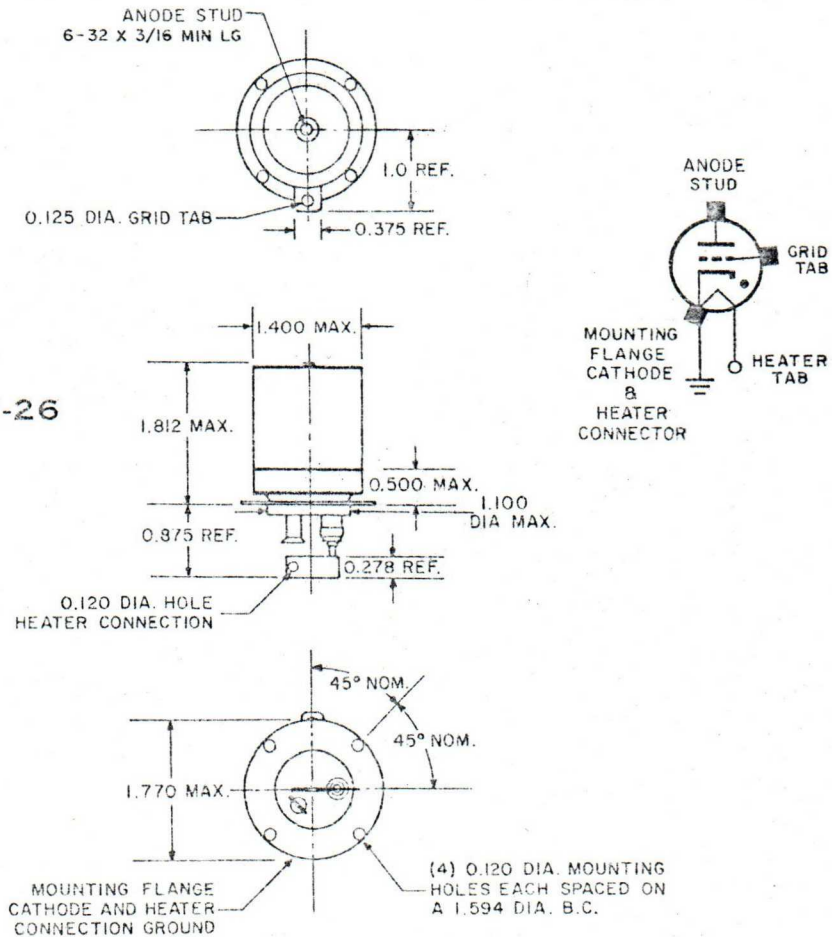
*(Lower case letters are peak values and upper case letters are average values.)

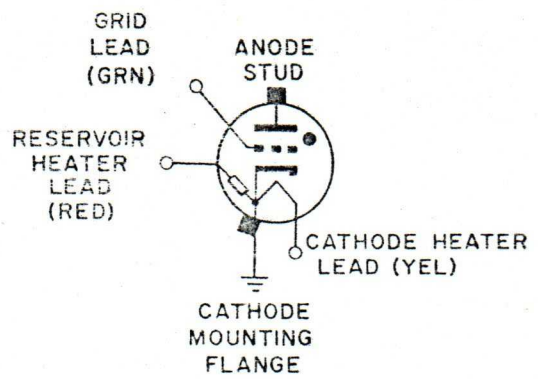
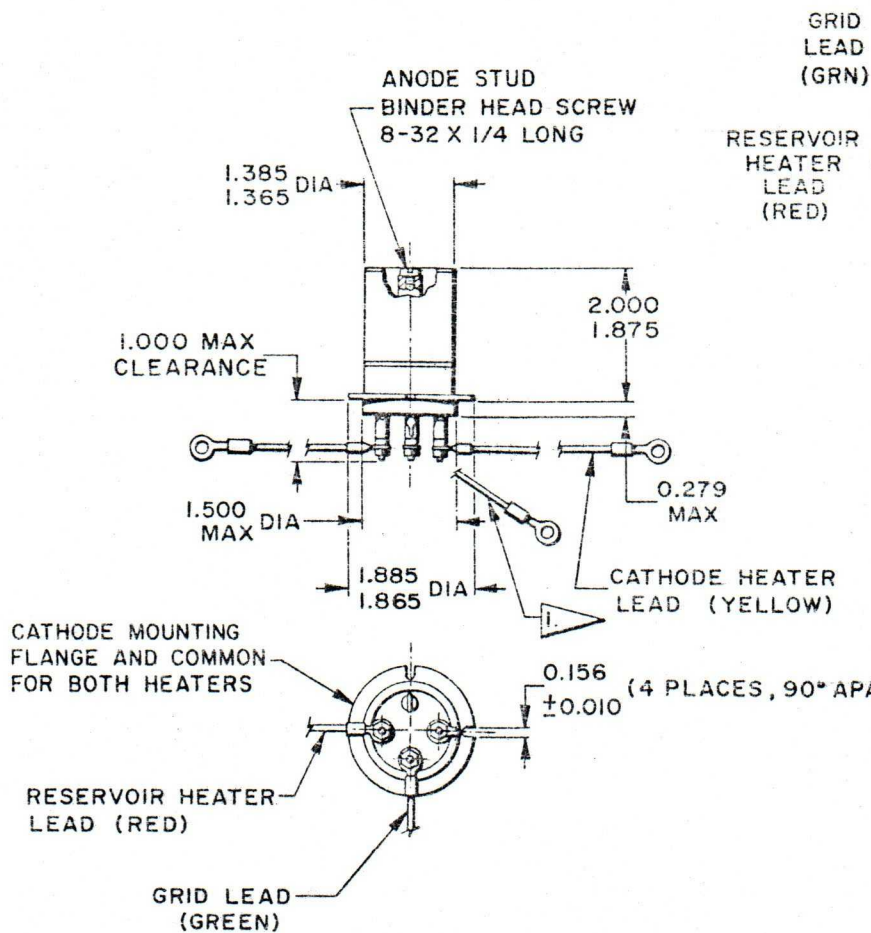
EG&G CERAMIC-METAL THYRATRONS

THYRATRON 7621/HY-2



THYRATRON HY-26

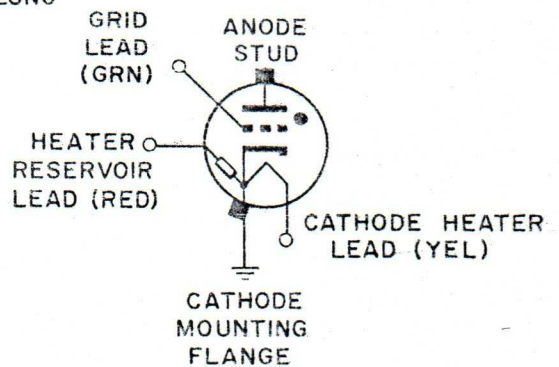
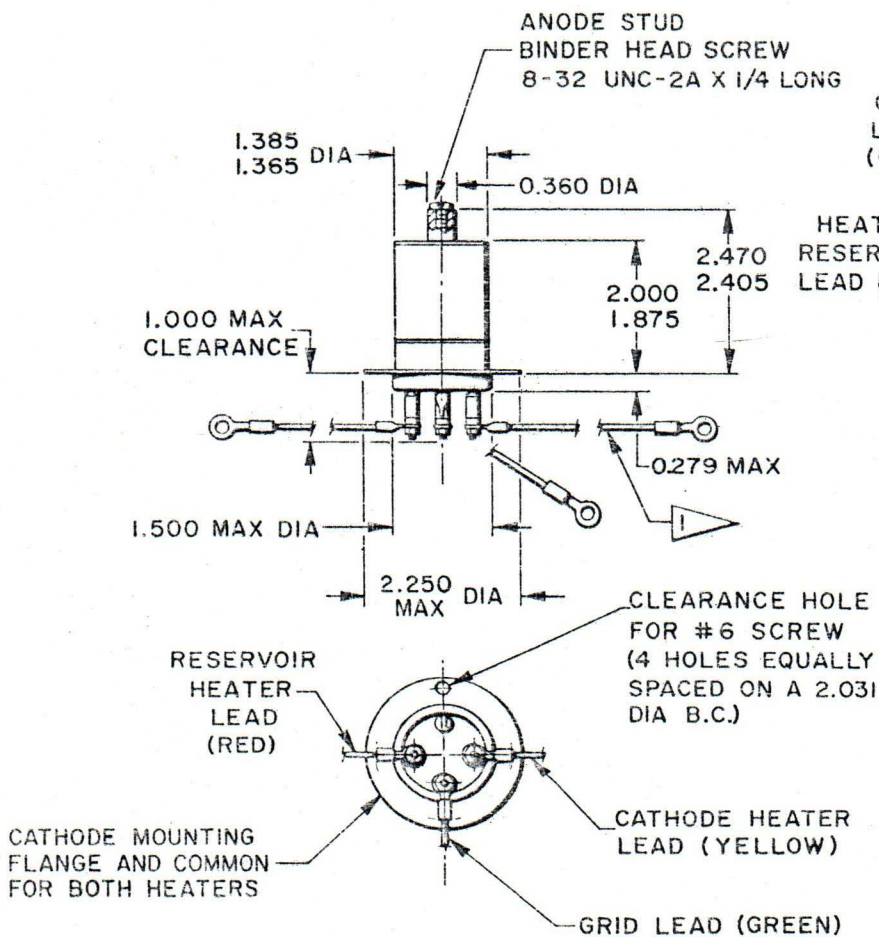




NOTES:

1. FLEXIBLE LEAD 6-1/2 LONG (3) LUG SIZE FOR #10 SCREW ON ALL LEADS

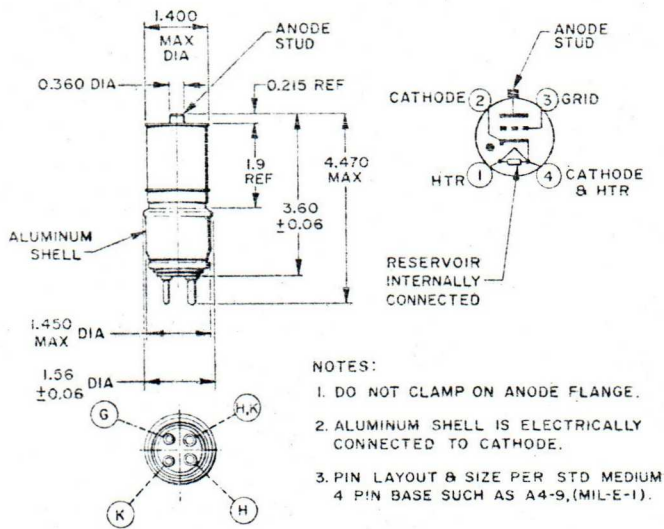
THYRATRON 7782/HY-6



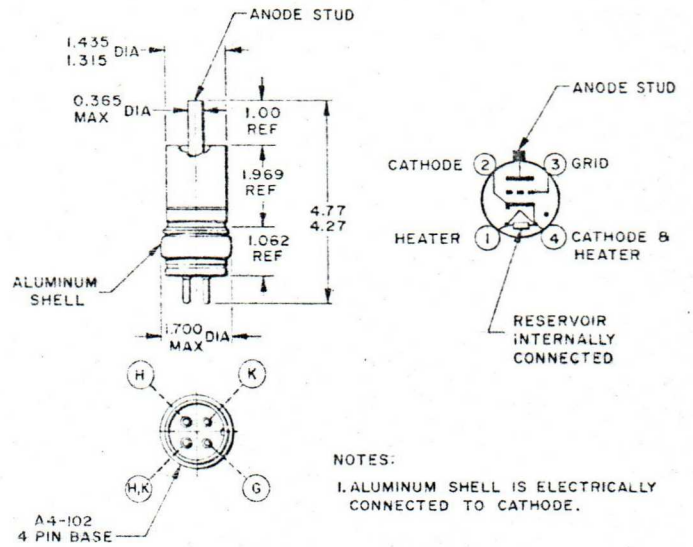
NOTES:

1. FLEXIBLE LEAD 6 1/2" LONG (3) LUG SIZE FOR #10 SCREW ON ALL LEADS

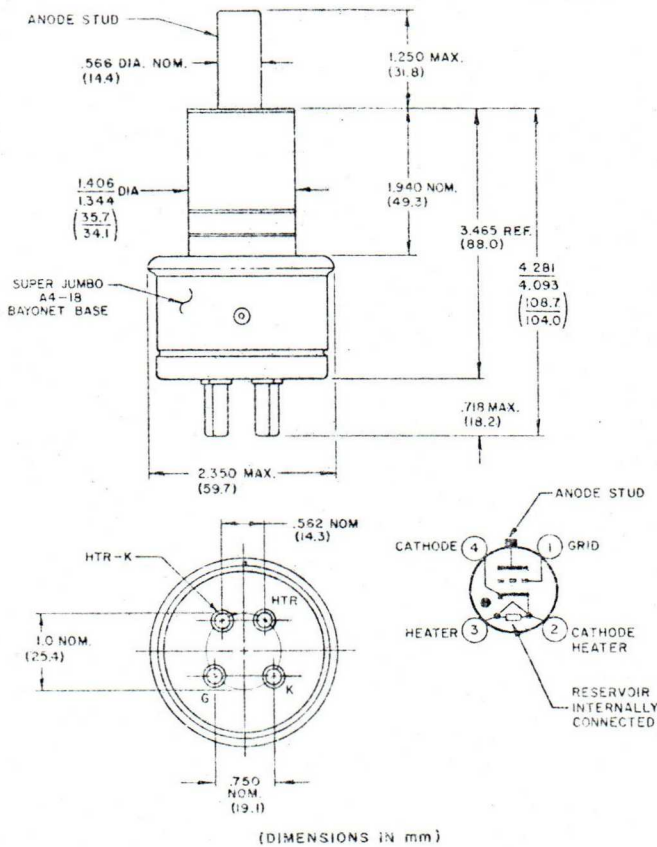
THYRATRON 7665/HY-60



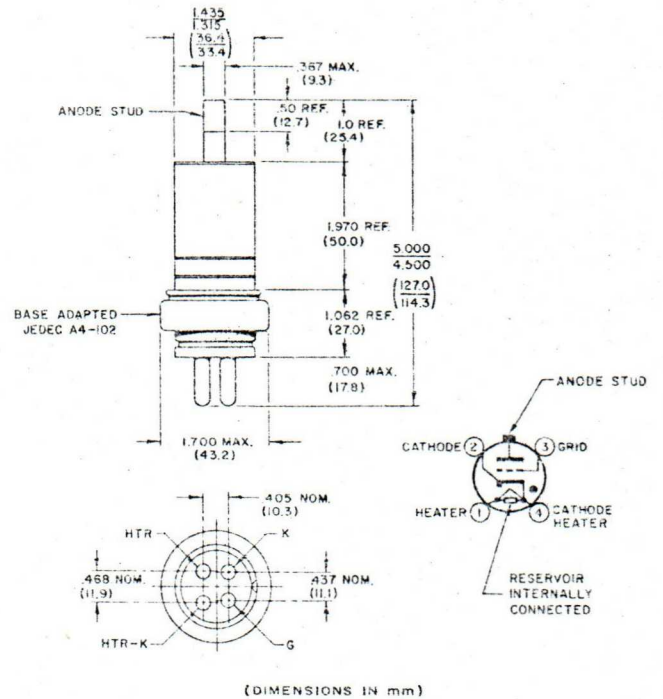
THYRATRON HY-61



THYRATRON 8765/HY-63

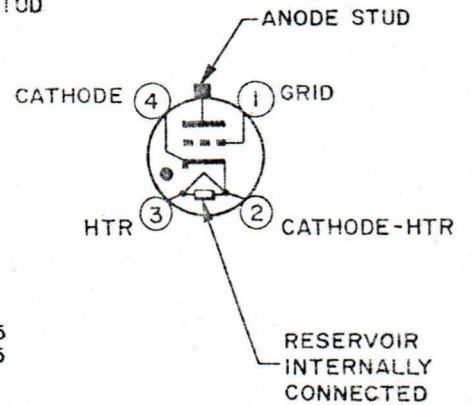
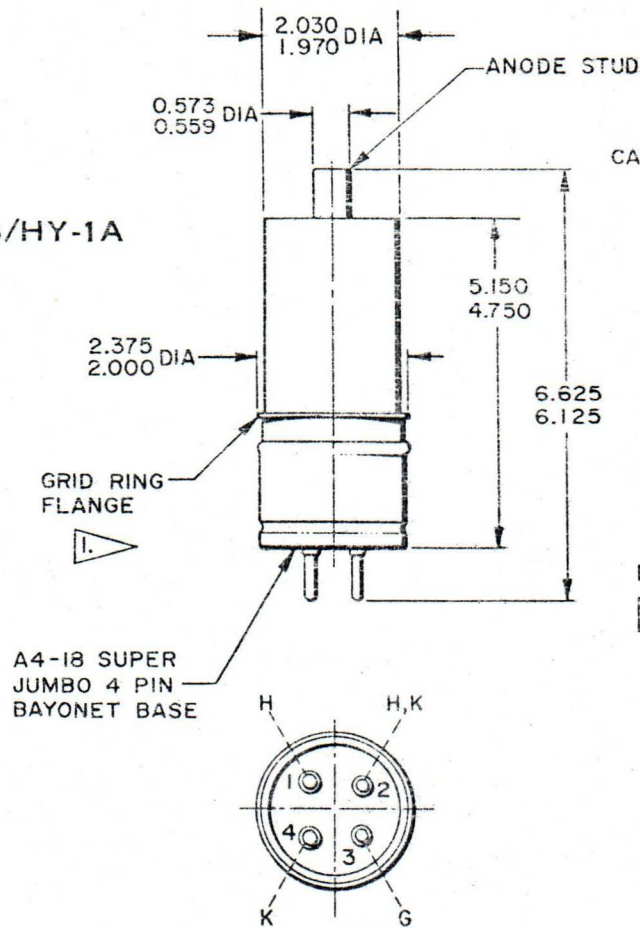


THYRATRON HY-6301



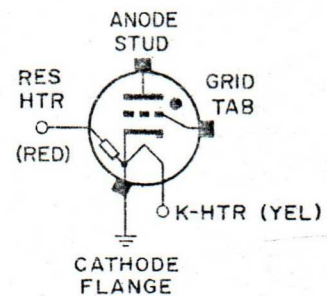
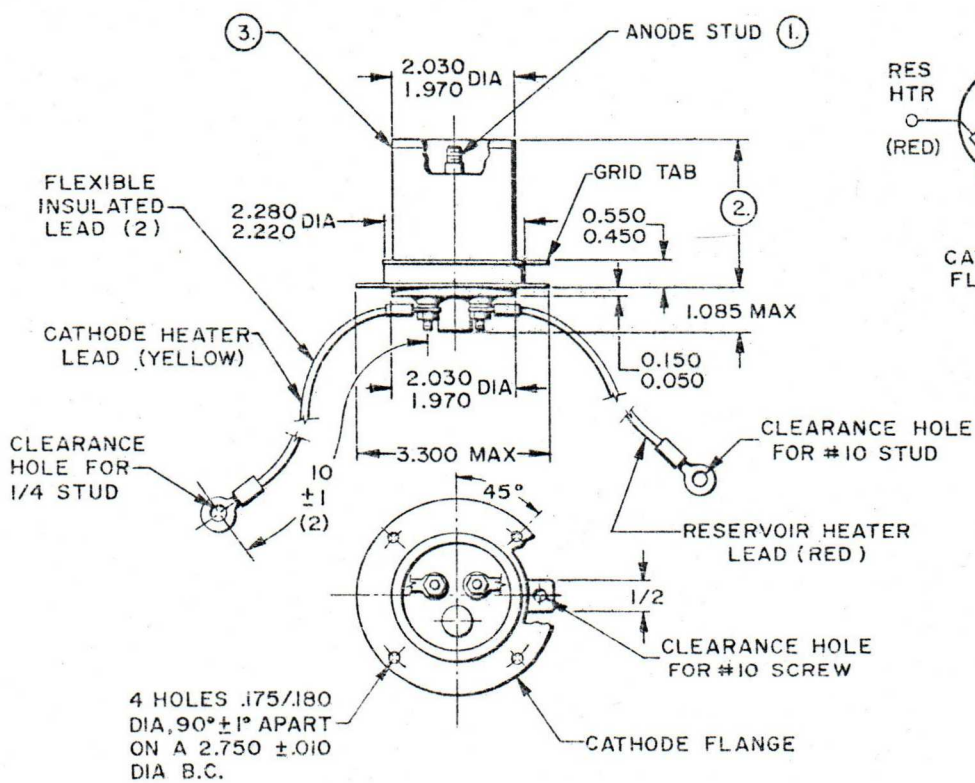
THYRATRON HY-6302

THYRATRON 8613/HY-1A



NOTES:

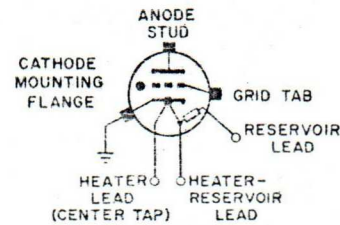
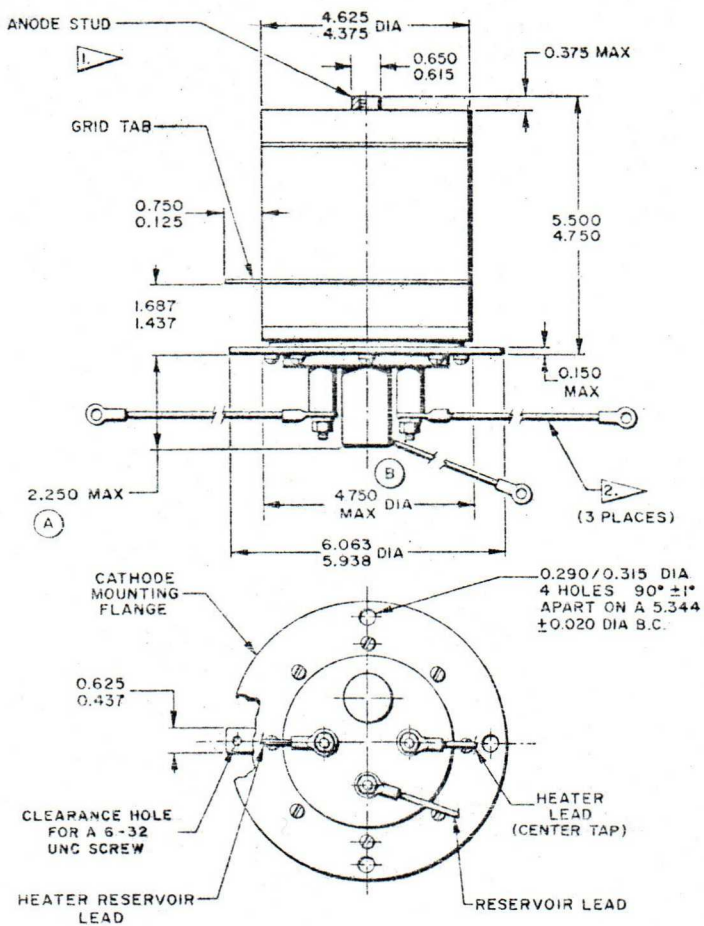
1. THIS FLANGE IS MECHANICALLY AND ELECTRICALLY CONNECTED TO THE GRID PIN NO. 1.
2. RECOMMENDED ANODE STUD: LIGHTWEIGHT SPRING CLIP TYPE (NATIONAL CO. TYPE 12 OR EQUIVALENT).



NOTES:

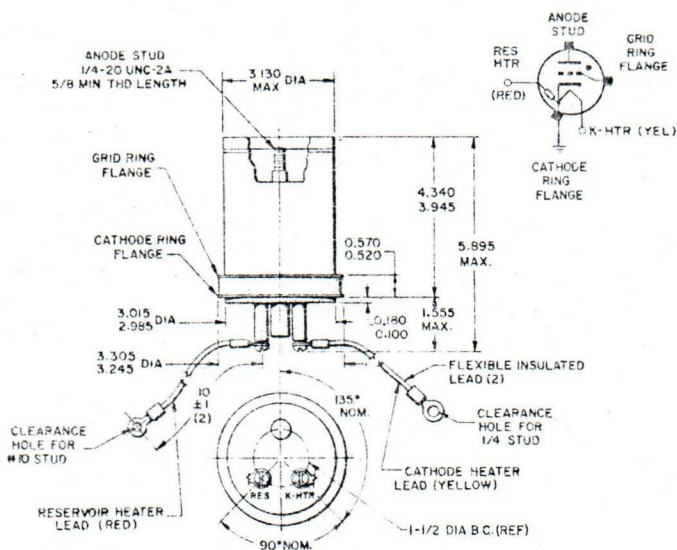
1. HY-10 ANODE STUD IS NO. 10-32 UNF - 3A X 5/8" MIN THREAD LENGTH. HY-11 ANODE STUD IS NO. 10-32 UNF - 2A X 3/16" MIN THREAD LENGTH.
2. DIM FOR HY-10 IS 3.370 (MIN) - 3.625 (MAX). DIM FOR HY-11 IS 2.179 (MIN) - 2.341 (MAX).
3. NO BACKING RINGS ON HY-11.

THYRATRONS 7620/HY-10 AND HY-11

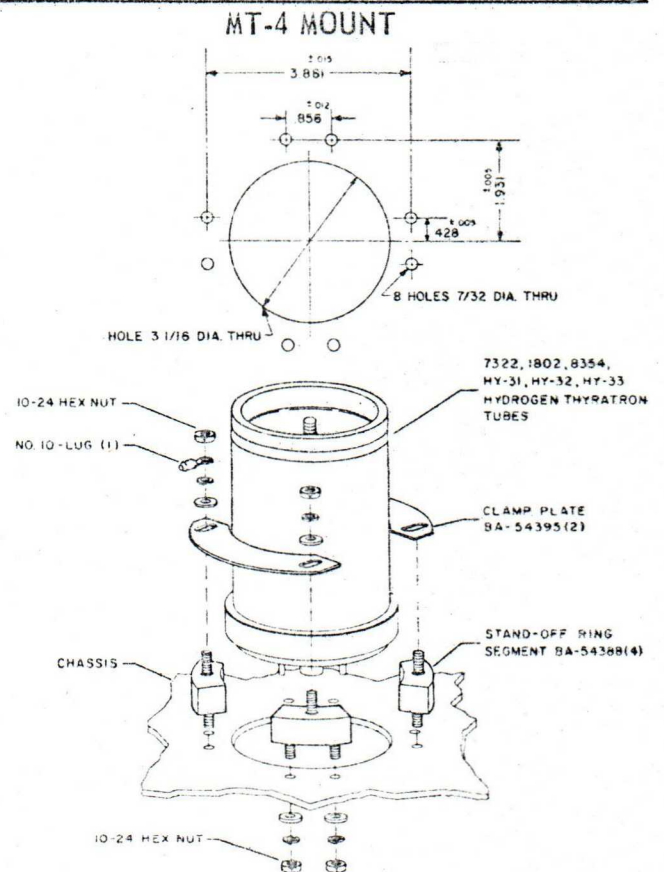


THYRATRON 8614/HY-5

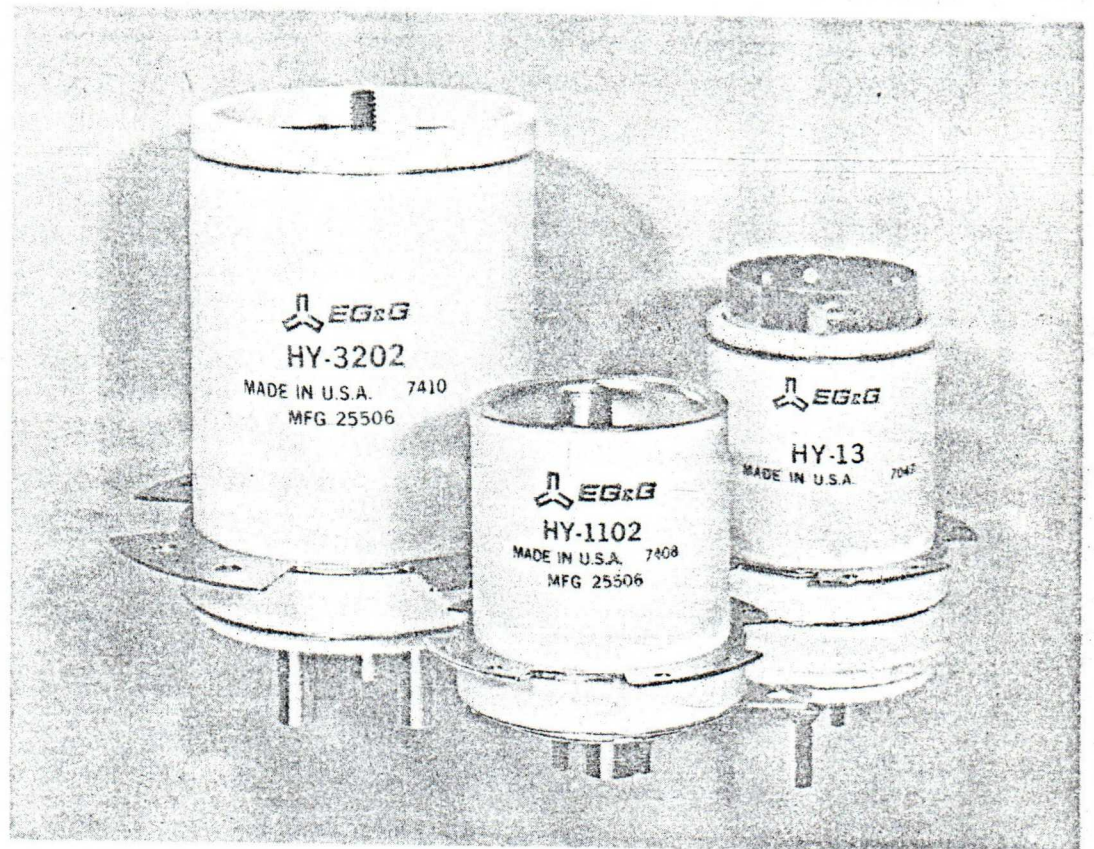
- NOTES:
- ANODE STUD IS TAPPED 1/4-20 UNC-2B FOR 1/2 LONG MACHINE SCREW.
 - FLEXIBLE INSULATED LEAD 10" LONG TERMINALS MAY BE RING, TONGUE OR SPADE COMPRESSION TYPE WITH INSULATION SLEEVING. COLOR CODE: H(HEATER)=YELLOW, H-R (HEATER-RESERVOIR)=YELLOW, R(RESERVOIR)=RED. LUG SIZE FOR #10 SCREW.
 - DIMENSIONS "A" AND "B" DEFINE CLEARANCE REQUIREMENTS BELOW MOUNTING FLANGE TO BE PROVIDED WITH EQUIPMENT.
 - RING TONGUE OR SPADE TERMINALS TO BE STAMPED H(HEATER), H-R (HEATER-RESERVOIR) AND R (RESERVOIR).



(MT-4 MOUNT OR EQUIVALENT REQUIRED)
**THYRATRONS 7322/1802,
 8354/HY-31 AND HY-32**



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CERAMIC METAL
GROUNDED GRID THYRATRONS

CERAMIC - METAL GROUNDED GRID THYRATRONS

Grounded grid thyratrons are negatively pulsed cathode switching devices, designed for use in circuits requiring faster switching times and higher peak currents of short duration as compared to conventional positive grid thyratrons.

MECHANICAL DATA

Outline drawings for the HY-13, HY-1102, and HY-3202 are shown on page 4.

A flange is provided for mounting and serves as the negative electrode connection. The anode is provided with a center stud and, on the HY-13, with a cylindrical extension for low inductance connections. On the HY-3202 and HY-1102 pressure contact can be made to the inner surface of the anode cup.

Trigger and heater connections are made to terminals on the base of the tube.

In the HY-13 an auxiliary grid is provided to reduce delay time, with connection made to the base terminal.

CIRCUIT CONNECTIONS

External discharge circuit connections, positive and negative, are made to the tube anode and grid, respectively.

The trigger pulse, which must be negative, is applied to the cathode of the tube. In order to prevent high pulse currents in the trigger generator circuits, it is recommended that an isolation resistor of at least 50 ohms be used.

The reservoir and cathode heater connections are made to the appropriate base feed-throughs. Since the heater returns are connected to the base and cathode, the heater supplies must be isolated from the trigger pulse. Either low capacity isolation transformers or series L-C filters may be used. The heaters may be connected in parallel, or separately.

The HY-13 auxiliary grid (g1) is connected through a base feed-through, and is supplied by a D. C. power supply between g1 and trigger with g1 positive with respect to trigger. It is recommended that the negative lead of the supply be isolated from the trigger with a series inductor of about 0.5 mh and that the supply be protected with a limiting resistor of 5 to 10K ohms.

In order to prevent continuous conduction to the anode with g1 current on, g1 must be biased negative with respect to the ground electrode.

CIRCUIT REQUIREMENTS

At firing rates above 10 pps, capacitor charging is best done with a reactor and diode as shown in the accompanying schematics. This charging method has several advantages over other means

of converting a voltage source to an impedance protected current source. Since the supply voltage need only be half of the capacitor voltage, voltage insulation requirements on the transformer-rectifier section are reduced. In addition, circuit conditions are much more favorable for good thyatron recovery and holdoff, since dv/dt on the thyatron anode is minimized during its recovery period.

A certain amount of load mis-match should be provided to present the tube with inverse voltage after firing, to enhance recovery. This negative voltage should be 5-10% of the peak forward voltage.

Negative grid bias will aid in high repetition rate operation. In the case of grounded grid operation, this takes the form of positive cathode bias, as shown in the HY-3202 and HY-1102 schematic.

It should be noted that the g1 element, added to the HY-13 to enhance switching time, has an adverse effect on holdoff capability.

Generally speaking, the cathode heater should be operated on the low side of the nominal range and the reservoir should be operated on the high side of the nominal range. Emissive material evaporated from the hot cathode will migrate in the tube and may cause degradation of forward holdoff. For this reason, the cathode heater power should be kept as low as is consistent with good triggering, and the anode should be allowed to run hot, up to 400°C.

In order to minimize switching and conduction loss, to obtain maximum life, and to obtain minimum switching time, the reservoir heater, and hence the tube pressure, should be operated as high as is consistent with maintaining forward holdoff capability.

Thyratrons manufactured by EG&G are normally conditioned in line type modulator circuits. Since this duty may not resemble a specific customer circuit, where extremes in repetition rate or other circuit parameter are encountered, some additional conditioning may be required. Low forward holdoff, for example, can usually be worked up by operating at reduced reservoir voltage and reduced anode voltage for a period of 5-30 minutes, gradually increasing both values, until desired anode voltage can be held off at maximum duty and highest practical tube pressure.

Tube inductance is found to be less than 15 nanohenries when used in tightly coupled coaxial discharge circuits.

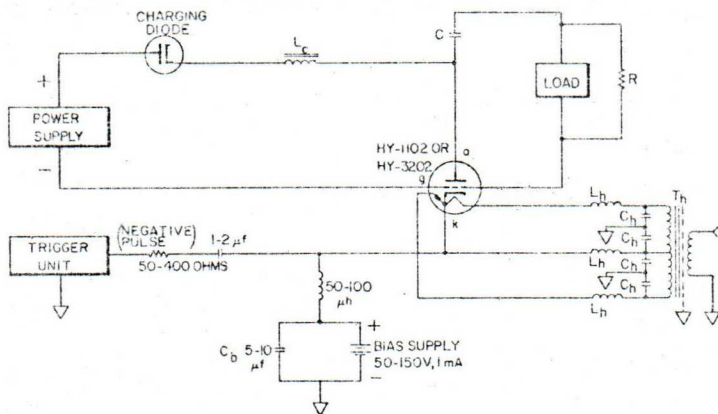
APPLICATIONS

HY-13 is primarily used in spark chamber applications. HY-1102 and HY-3202 are used for fast switching applications for pulsing gas lasers such as CO₂, TEA, and nitrogen lasers.

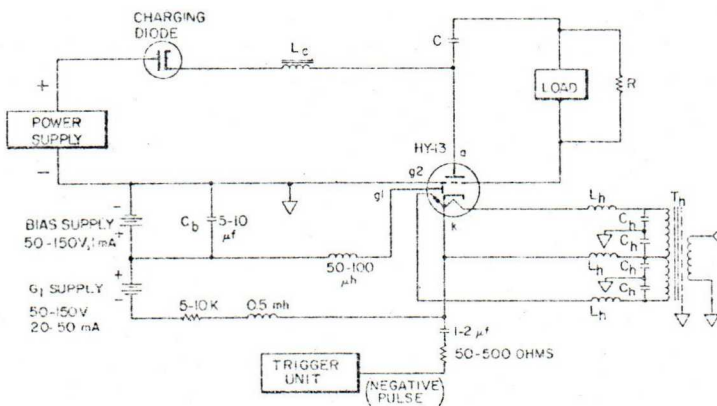
ELECTRICAL SPECIFICATION CHART

		Type		
		HY-13	HY-1102	HY-3202
MAXIMUM SWITCHING RATINGS				
V_{fy} , Forward Anode Voltage (kv)		15	20	35
i_b , Peak Current (a)		120,000	120,000	120,000
Coulombs/Shot		1.5×10^{-3}	1.5×10^{-3}	5.0×10^{-3}
SWITCHING TIMES, TYPICAL				
Current Rise Time (ns)		7	7	7
Triggering				
V_{fy} Open Circuit Peak Trigger Voltage (kv)	Maximum	2.5	2.5	2.5
	Minimum	0.20	0.20	0.45
Z_g Trigger Source Impedance (ohms)	Maximum	500	500	400
	Minimum	50	50	50
Auxiliary Grid (g1) Current (mA)	Maximum	40	N/A (Triode Configuration)	N/A (Triode Configuration)
	Minimum	0		
Starting Voltage (V)	Maximum	150		
t_{ad} - Trigger Delay Time (μ s)	Maximum	0.5 or $i_{(g1)} = 0 \text{ mA}$ 0.35 or $i_{(g1)} = 35 \text{ mA}$	0.5	0.5
CATHODE FILAMENT HEATER REQUIREMENTS				
E_f (Vac)	Maximum	6.3	6.8	6.8
	Minimum	5.8	5.8	5.8
	Typical	5.8	5.8	5.8
I_f Current (at 6.3 Vac, Aac)	Range	5.5 to 7.5	5.5 to 7.5	11 to 18
RESERVOIR FILAMENT HEATER REQUIREMENTS				
E_{res} (Vac)	Maximum	6.8	6.8	6.8
	Minimum	5.8	5.8	5.8
	Typical	6.3	6.3	6.3
I_{res} Current (at 6.3 Vac, Aac)	Range	1 to 4	2 to 8	6 to 13
t_k Filament Warm-Up Time (Minutes)	Maximum	10	10	10

OPERATING CIRCUITS



TYPICAL HY-1102, HY-3202 CIRCUIT



TYPICAL HY-13 CIRCUIT

C - Energy storage capacitor - typically greater than $0.001 \mu\text{F}$.

L_c - Charging inductor - optimum value is $L_c = T/\pi^2 C$, where T = interpulse time.

R - For gas discharge load, choose R to give 1 to 5 amps tube current under open load conditions, before load conduction occurs (typically $\approx 10 \text{ Kohms}$).

C_b - Bias capacitor - located close to tube.

L_h - Heater pulse blocking inductance 50 to 150 μH or use EG&G TC-1724 (100 μH parallel pair - 1 unit per transformer winding).

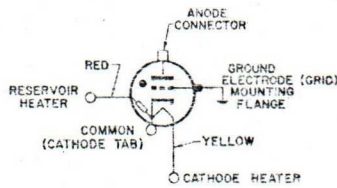
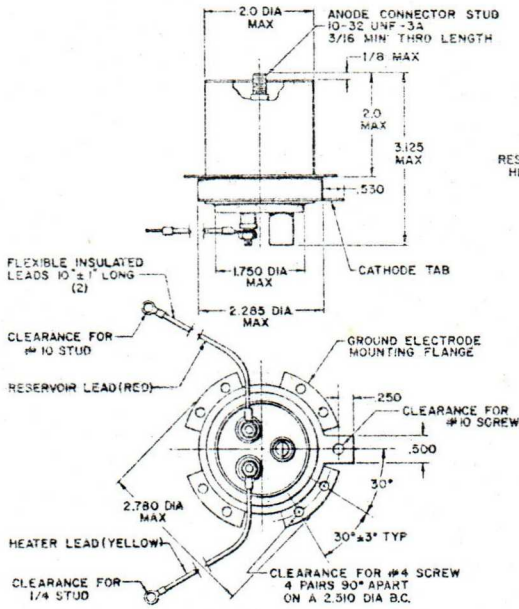
C_h - Heater pulse filter capacitor 5 μF at 200 VDC typ. (typical part, Acushnet - P8292ZNI208).

T_h - Heater transformer with electrostatic shielding. Schematics show connections for independent windings. A single winding with parallel heater connection, or with heater taps at different voltages, may also be used.

Trigger Unit - See Trigger Requirement per chart or use EG&G TM-27 Trigger Module.

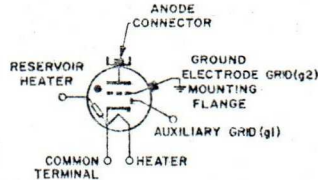
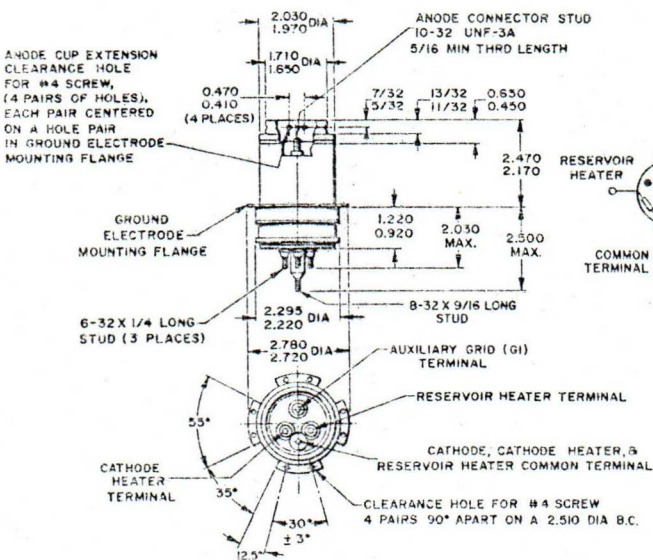
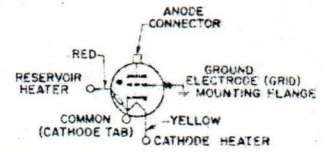
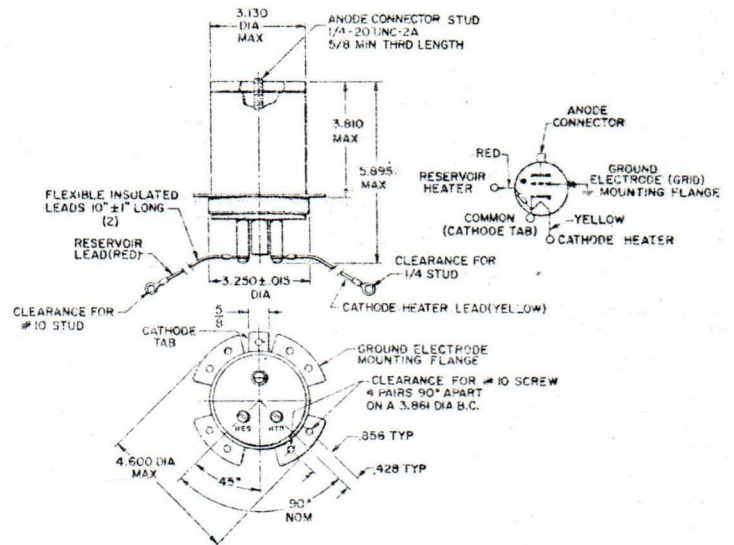
MECHANICAL

NOTE: All dimensions in inches.



HY-1102

HY-3202



HY-13

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EG&G INC. ELECTRO-OPTICS DIVISION, 35 CONGRESS STREET, SALEM, MASS. 01970
TEL: 617-745-3200 TWX: 710-347-6741

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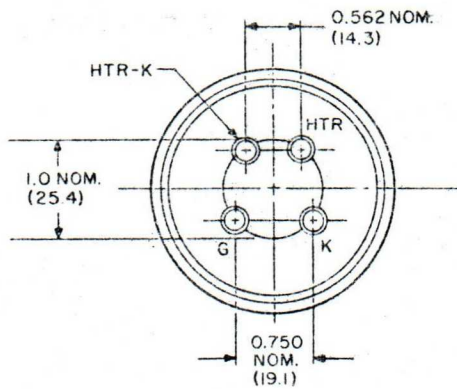
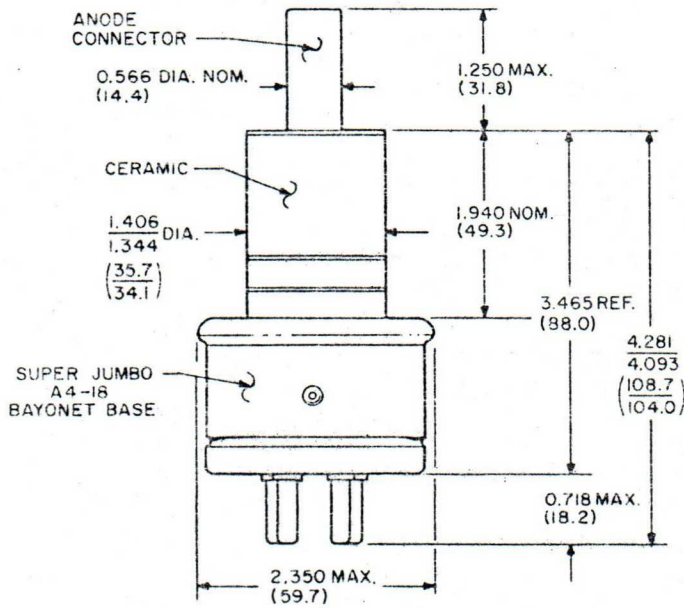
HY-6301 and HY-6302
CERAMIC METAL HYDROGEN THYRATRONS
 for
WEATHER RADAR SYSTEMS

WEATHER RADAR SYSTEM	EG&G TUBE TYPE	REPLACES TUBE TYPE
RCA AVQ-10	HY-6301	4C35, FX-2505, 6268, SGR-1
BENDIX RDR-1	HY-6302	FX-2517, KU-17, 8765/KU-71Z

CHARACTERISTIC	MAXIMUM RATINGS HY-6301, HY-6302	TYPICAL OPERATION	
		HY-6301 AVQ-10	HY-6302 RDR-1
Peak Forward Anode Voltage e _{py} (kv)	12	8.5	5
Peak Anode Current i _b (a)	350	95	85
DC Ave. Current I _b (Aac)	0.5	0.084	0.085
RMS Plate Current I _p (Aac)	6.5	2.8	2.7
Heater Voltage E _f (Vac)	5.8-6.8	6.3	6.3
Heater Current I _f (Aac)	5.5-8.5	6.4	6.4
Peak Forward Grid Voltage, e _{gy} (v) (min.)	150	188	175
Impedance of Grid Circuit Z _g (ohm) (max.)	1500	560	<1000
Minimum Life T (hrs)		WEATHER RADAR 3000*	
Per MIL-E-1/1485	500		
Per MIL-E-1/1661	1000		

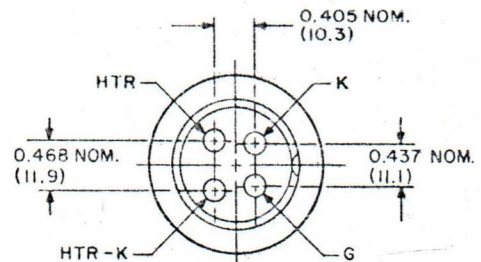
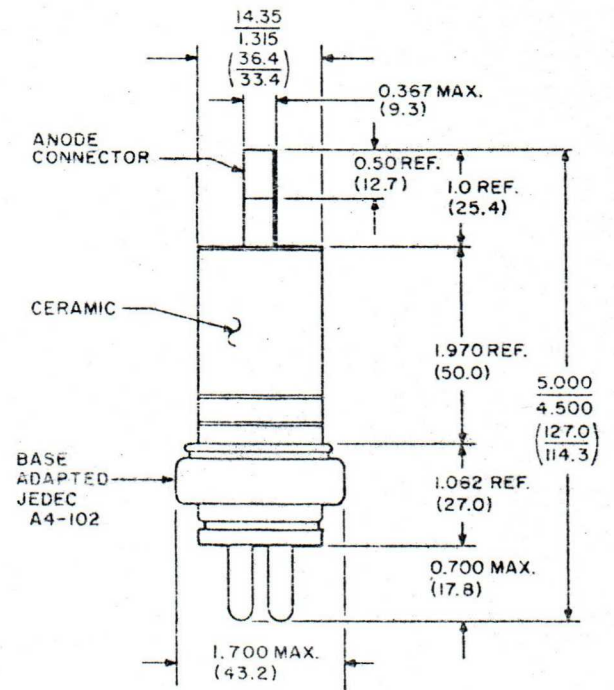
*Based on EG&G Life Tests completed by August 1975, under simulated weather radar conditions.

MECHANICAL DIMENSIONS
IN. - (mm)



HY-6301

(FX2505)



HY-6302

(FX2517)

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