

INCH-POUND

MIL-PRF-1/1661C
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SUPERSEDING
MIL-PRF-1/1661B
10 July 1998

PERFORMANCE SPECIFICATION SHEET

ELECTRON TUBE, THYRATRON TYPE 8765

This specification is approved for use by all Departments and Agencies of the Department of Defense.

The requirements for acquiring the electron tube described herein shall consist of this document and the latest issue of MIL-PRF-1.

DESCRIPTION: Triode, hydrogen, ceramic-metal.
See figure 1.
Mounting position: Any.
Weight: 7 ounces (198.5 grams) nominal.

ABSOLUTE RATINGS:

Parameter:	Ef	Ebb	Ecc	egy	egx	epy	epx	lb
Unit:	V ac	V dc	V dc	v	v	kv	kv	A dc
Maximum:	6.8	---	150	600 <u>3/</u>	200	12.0 <u>1/</u>	12.0 <u>2/</u>	0.2
Minimum:	5.8	300	---	175	---	----	5% epy	----
Test conditions:	6.3	---	0	150	---	12.0	----	----

ABSOLUTE RATINGS:

Parameter:	ib	Ip	dik/dt	Pb	pr	tj	tk	TA
Unit:	a	A ac	a/μs	---	---	μs	sec	°C
Maximum:	350	5.0	2,000	4.0 x 10 ⁹	----	0.005	---	+150
Minimum:	----	----	---	---	---	---	180	-55
Test conditions:	----	---	---	---	1,500	---	180	----

See footnotes at end of table I.

GENERAL:

Qualification - Required. 4/

MIL-PRF-1/1661C

TABLE I. Testing and inspection.

Inspection	Method	Conditions	Acceptance Level <u>11/</u>	Symbol	Limits		Unit
					Min	Max	
<u>Conformance inspection,</u> <u>part 1</u>							
Instantaneous starting <u>4/</u>	3267	epy = 12 kv (min); Ef = 6.8 V ac	0.65	----	----	----	----
Operation (1) <u>5/</u>	3246	Ef = 5.8 V ac; epy = 14 kv; t = 10 minutes	0.65	egy	----	150	v
DC anode voltage for conduction	3247	Ef = 5.8 V ac	0.65	Ebb	----	300	V dc
Pulse emission	3251	ik = 350 a; tp = 5.0 μs ± 10%; pr = 60 ± 10%; tr = 0.5 μs (max); specified time interval = 2.5 μs	0.65	egk	----	200	v
Heater current	3241		0.65	If	4.5	9.5	A ac
<u>Conformance inspection,</u> <u>part 2</u>							
Operation (1A)	3246	Operation (1); Ef = 6.8 V ac; tk = 5 minutes; t = 10 minutes	----	egy	----	150	v
Anode delay time	3256	Operation (1); t = 120 seconds	----	tad	----	0.5	μs
Anode delay time drift <u>6/</u>	3256	Anode delay time	----	Δtad	----	0.10	μs
Time jitter <u>5/ 7/</u>	3261	Operation (1), except epy = 3 kv	----	tj	----	0.005	μs
<u>Conformance inspection,</u> <u>part 3</u>							
Life test <u>5/</u>	----	Group C; t = 96 hours “on” and 1 hour “off” (tube mounted in horizontal position); t = 500 hours	---	---	---	---	---
Life test end points: Operation (1) and (1A)	---						
DC anode voltage for conduction	3246 3247		----	egy Ebb	----	150 300	v V dc
Time jitter	3261	egy = 150 v	----	tj	----	0.005	μs
Variable-frequency vibration <u>8/ 9/</u>	1031	No voltages applied	----	----	----	----	----
Shock <u>8/</u>	1041	100 G; no voltages applied	----	----	----	----	----

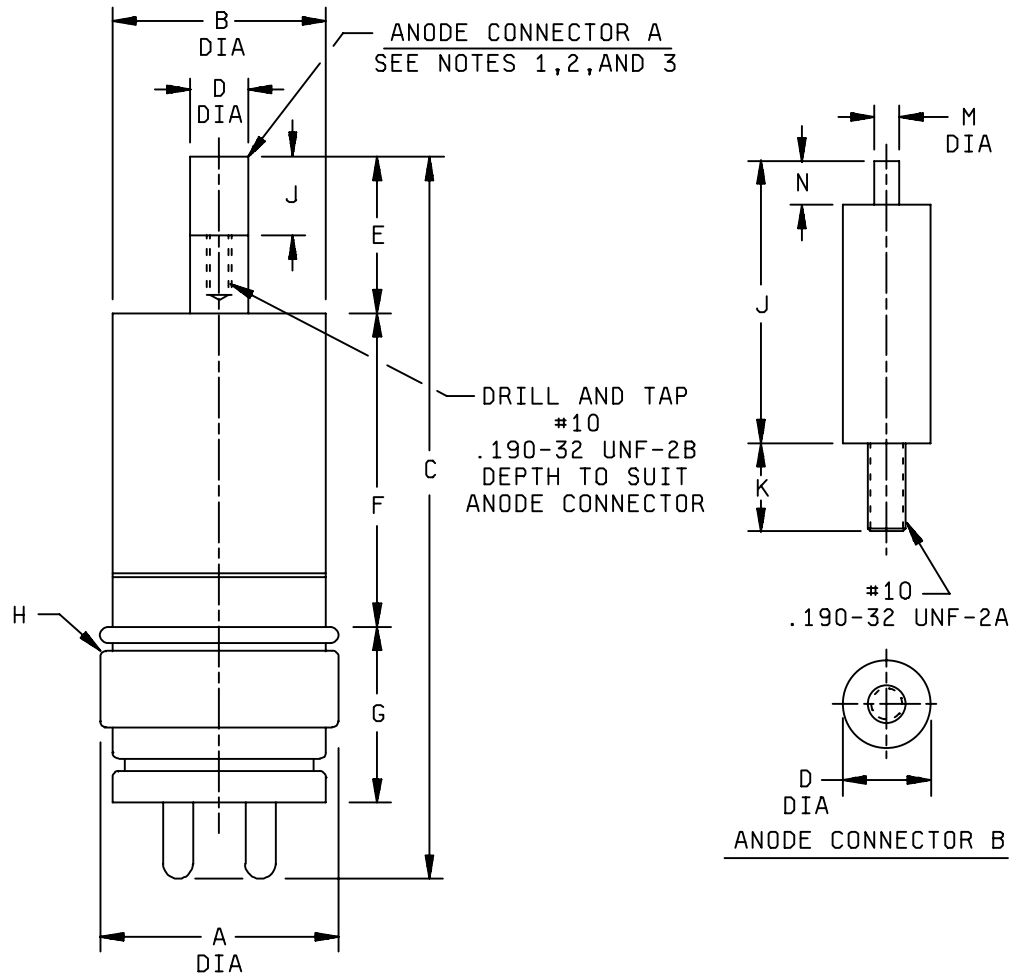
See footnotes at end of table.

MIL-PRF-1/1661C

TABLE I. Testing and inspection - Continued.

Inspection	Method	Conditions	Symbol	Limits		Unit
				Min	Max	
<u>Conformance inspection, part 3</u> - Continued						
Shock and variable-frequency vibration end points:						
Operation (1)	3246		----	----	----	----
Time jitter	3261		tj	----	0.005	μs
Operation at elevated ambient temperature 5/ 8/ 10/	3246	TA = 150°C; t = 5 hours	egy	----	150	v

- 1/ Instantaneous starting is permissible. The maximum permissible epy is 8.0 kv and shall not be attained in less than 0.04 seconds.
- 2/ In pulsed operation, the peak inverse voltage, exclusive of a spike of 0.05 μs maximum duration, shall not exceed 2.0 kv during the first 25 μs following the anode pulse.
- 3/ The driver pulse, measured at the tube socket with thyatron grid disconnected shall have the following characteristics: 175 volts minimum; 600 volts maximum; tr = 0.35 μs maximum; grid pulse duration 2.0 μs minimum. Impedance of drive circuit: 50 to 1,500 ohms. At -55°C, a minimum of 250 V is required.
- 4/ This shall be the first test after the holding period. The tube shall operate satisfactorily on push-button starting within three attempts when the anode voltage (epy) is applied to the tube under test in such a manner as to rise from 0 to 8 kv minimum within 0.03 second. (The filter in the rectifier shall be so designed that the epy reaches at least 4 kv within 0.015 second). The interval between successive attempts to instantaneously start the tube shall be not less than 10 nor more than 30 seconds. Any tube failing to start within three attempts shall be considered a failure.
- 5/ The circuit constants shall be so chosen, that at epy = 14 kv under resonant charging conditions; dik/dt = 1,500 a/μs (min); ib = 150a (min); tp = 1.0 μs ± 10 percent; prr = 1,000 pps (min); Rg1 = 30,000 ohms. Grid pulse characteristics shall be: tp = 2.0 μs (max); tr = 0.34 μs (min); and driver impedance = 500 ohms (min).
- 6/ This test shall be performed simultaneously with the operation (1) test. An anode delay time measurement shall be made at the end of 2 and 10 minutes of the operation (1) test. The change in anode delay time (with respect to the 2 minute reading) shall not exceed the specified value.
- 7/ The tube shall be tested by applying a peak forward anode voltage not to exceed the value specified in the test conditions for the time jitter test immediately after the cathode warmup period (tk). After 60 seconds of operation the variation in firing time (tj) shall be not greater than the amount specified.
- 8/ This test shall be performed during the initial production and once each succeeding 12-calendar months in which there is production. An accept on zero defect sampling plan shall be used, with sample of three tubes with an acceptance number of zero defects. In the event of failure, the test will be made as a part of conformance inspection, part 2, with an acceptance level of 6.5 (see 11/). The regular "12-calendar month" sampling plan shall be reinstated after three consecutive samples have been accepted.
- 9/ There shall be no pronounced resonance in the range from 0 to 2,000 Hz.
- 10/ This test shall be conducted for a total of 5 consecutive hours with no more than 3 kickouts and with no evidence of detrimental anode heating. The tube shall be started with 107.5 percent Ef and operate at this value for 4 hours. At the start of the fifth hour, and while the tube is still operating, the voltage shall be lowered to Ef = 92.5 percent and remain there for the final hour of operation.
- 11/ This specification sheet uses accept on zero defect sampling plan in accordance with MIL-PRF-1, table III.



Pin connections	
Pin No.	Element
1	h
2	k
3	g
4	h & k
cap	a

FIGURE 1. Outline drawing of electron tube type 8765.

MIL-PRF-1/1661C

Ltr	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
Conformance inspection, part 2				
A	----	1.630	----	41.40
B	1.315	1.435	33.40	36.45
C	4.270	4.770	108.46	121.16
D	.355	.365	9.02	9.27
M	.077	.083	1.96	2.11
N	.188	----	4.78	----
Conformance inspection, part 3 (see note 4)				
H	Base: A4-102 (EIA)			
Reference dimensions				
E	1.000		25.40	
F	1.969		50.01	
G	1.062		26.97	
J	.500		12.70	
K	.375		9.53	

NOTES:

1. Types 8765 and 8370, use anode connector A.
2. To replace type 5957, remove anode connector A.
3. To replace type 5956, remove anode connector A and replace with anode connector B.
4. Dimensions shall be checked during the initial production and once each succeeding 12-calendar months in which there is production. An accept on zero defect sampling plan shall be used, with sample of three tubes with an acceptance number of zero defects. In the event of failure, the test will be made as a part of conformance inspection, part 2, with an acceptance level of 6.5 (see 11/ on page 3). The regular "12-calendar month" sampling plan shall be reinstated after three consecutive samples have been accepted.

FIGURE 1. Outline drawing of electron tube type 8765 - Continued.

Custodians:

Army - CR
Navy - EC
Air Force - 11
DLA - CC

Preparing activity:

DLA - CC

(Project 5960-3696)

Review activities:

Army - CR4, MI
Navy - AS, CG, OS
Air Force - 99