

HARD TUBE PULSE MODULATOR TYPE 7691

The 7691 is a large three-electrode, forced air cooled tube designed for pulse applications as a hard-tube modulator. The anode is capable of dissipating 10 kilowatts, exclusive of filament heating power. The cathode is a multiple-strand, thoriated-tungsten filament which may be operated either single phase or 3 phase.

ELECTRICAL

Cathode Multiple-Strand, Thoriated-Tungsten Filament

Filament:

Voltage:

Single Phase Connection	12	Volts
3 Phase Connection (to neutral)	12	Volts

Current:

Single Phase Connection	309	Amperes
3 Phase Connection (per phase)	103	Amperes

Minimum Filament Heating Time 15 Seconds

Amplification Factor 21

Direct Interelectrode Capacitances: (approx.)

Grid to Plate	42	$\mu\mu\text{f}$
Grid to Filament	95	$\mu\mu\text{f}$
Plate to Filament	8	$\mu\mu\text{f}$

LONG PULSE OPERATION

MAXIMUM RATINGS:

Absolute Maximum Values

DC Plate Voltage	60	max.	Kilovolts
DC Grid Voltage	-3500	max.	Volts
Peak Positive Grid Voltage	2500	max.	Volts
Peak Pulse Plate Current	150	max.	Amperes
Peak Pulse Grid Current	50	max.	Amperes
Plate Dissipation	10	max.	Kilowatts
Grid Dissipation	1.0	max.	Kilowatt
Pulse Length	1000	max.	$\mu\text{seconds}$
Duty Factor	0.01	max.	
Peak Pulse Cathode Current	200	max.	Amperes

SHORT PULSE OPERATION

MAXIMUM RATINGS:

Absolute Maximum Values

DC Plate Voltage	60	max.	Kilovolts
DC Grid Voltage	-3500	max.	Volts
Peak Positive Grid Voltage	3500	max.	Volts
Peak Pulse Plate Current (Note 1)	400	max.	Amperes
Peak Pulse Grid Current (Note 1)	100	max.	Amperes
Peak Pulse Cathode Current (Note 1)	500	max.	Amperes
Plate Dissipation	10	max.	Kilowatts
Grid Dissipation	1.0	max.	Kilowatt
Pulse Length	0.5	max.	$\mu\text{seconds}$
Duty Factor	0.0012		

MECHANICAL:

Mounting Vertical, Anode Down

Net Weight 60 Pounds

Shipping Weight 125 Pounds

Cooling:

Method Forced Air Flow

Maximum Ambient Air Temperature 50 °C

Maximum Bulb and Seal Temperature 180 °C

Required Air Flow Through Radiator:

Plate Dissipation	10	8	5	Kilowatts
Air Flow	800	700	500	CFM
Static Pressure	2.75	2	1	In. H ₂ O

1. These values are attainable only under the following filament conditions.

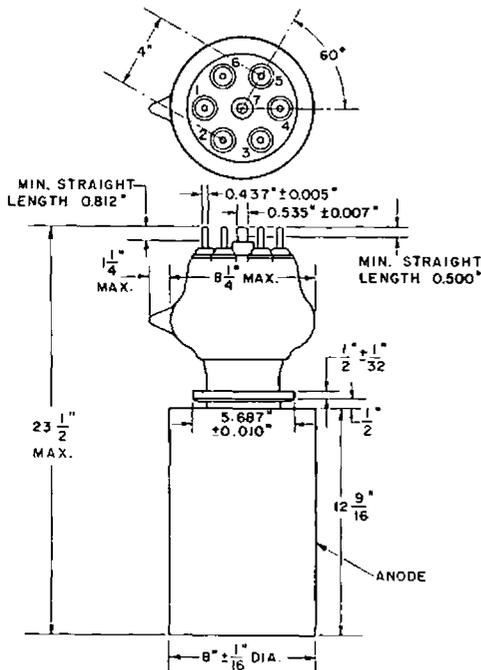
Filament Voltage:

Single Phase	13	Volts
Three Phase (to neutral)	13	Volts

Filament Current:

Single Phase	318	Amperes
Three Phase (per phase)	106	Amperes

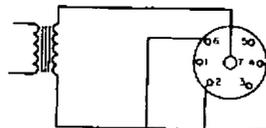
X-Ray Warning: The Maximum Ratings of the 7691 permit operation at voltages in excess of 16 KV. Therefore equipment design considerations should include the possible generation of soft x-rays.



FILAMENT CONNECTIONS

SINGLE PHASE AC SUPPLY

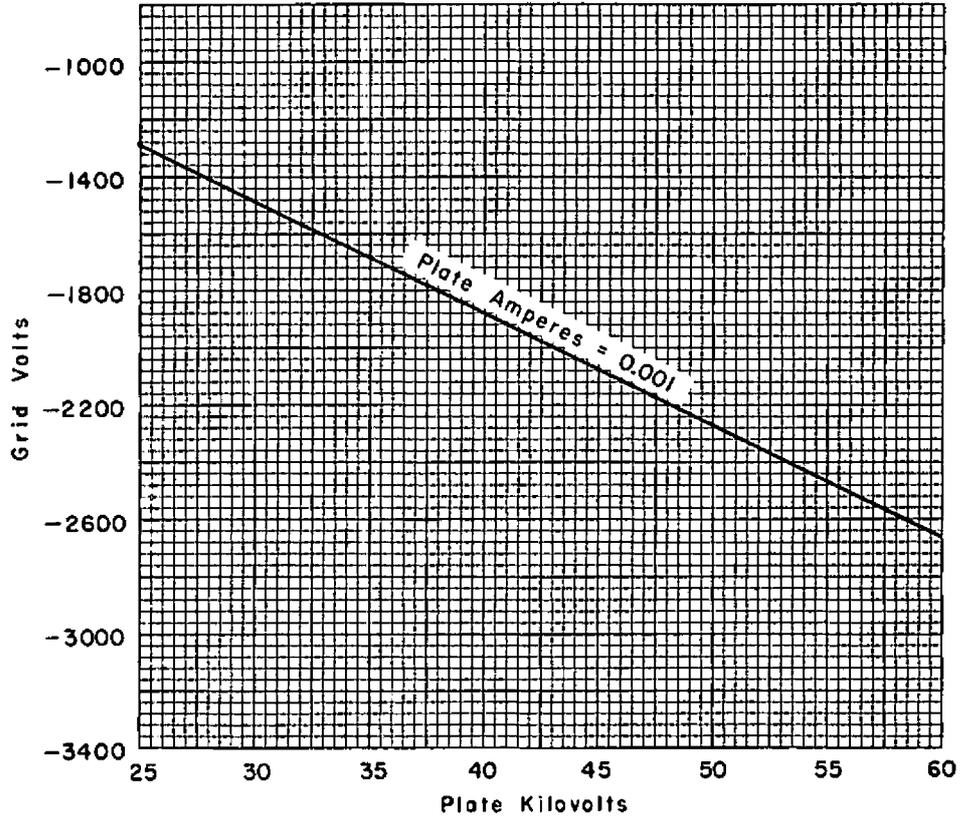
THREE PHASE AC SUPPLY



FILAMENT TERMINALS 2, 4, 6 & 7 PAINTED BLACK
GRID TERMINALS 1, 3, & 5 PAINTED RED

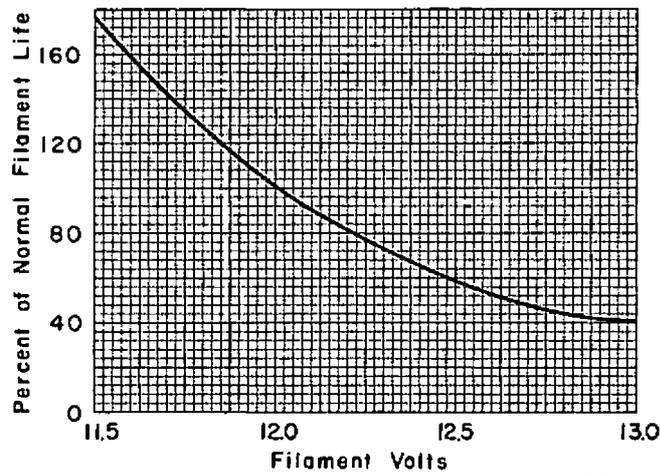
CE-A1521

HIGH VOLTAGE CUT-OFF CHARACTERISTICS

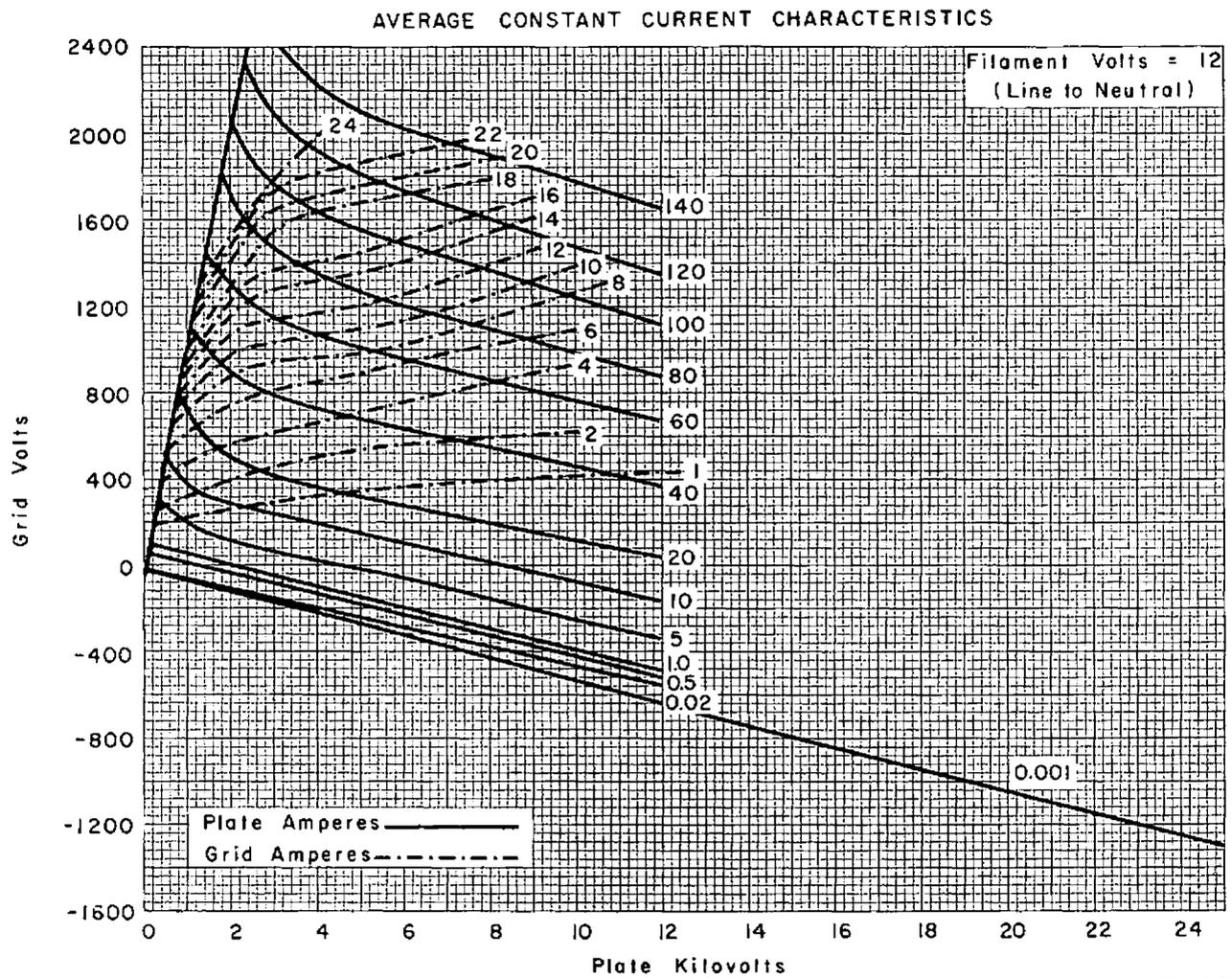


CE-A1518 R1

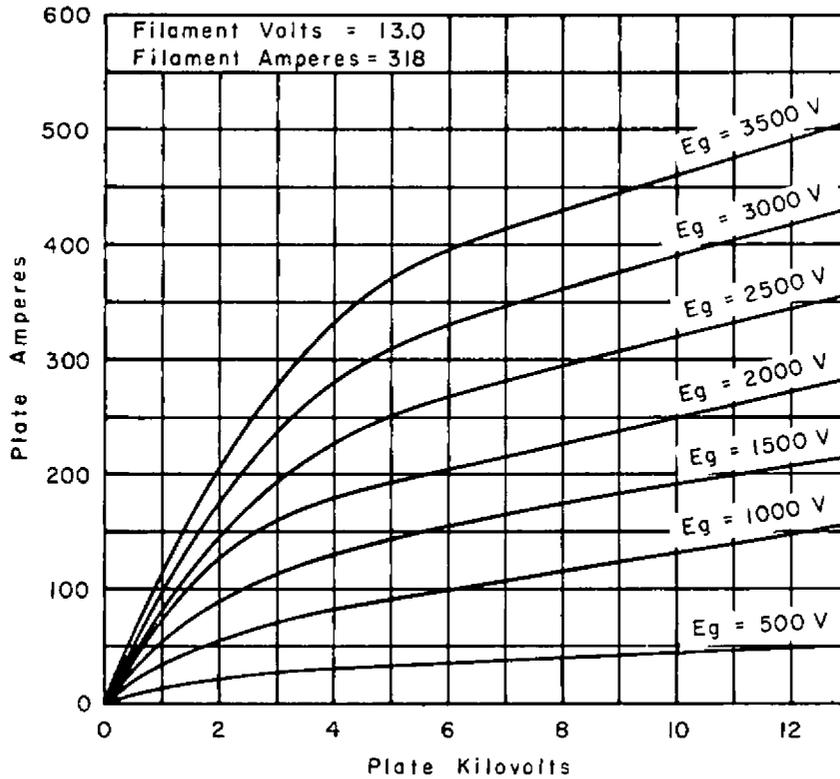
AVERAGE FILAMENT LIFE EXPECTANCY



CE-A1510 R1



AVERAGE PLATE CHARACTERISTICS
(0.5 Microsecond Pulse Service)



AVERAGE GRID CHARACTERISTICS
(0.5 Microsecond Pulse Service)

