

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 $\mu\mu\text{f}$

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

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	

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

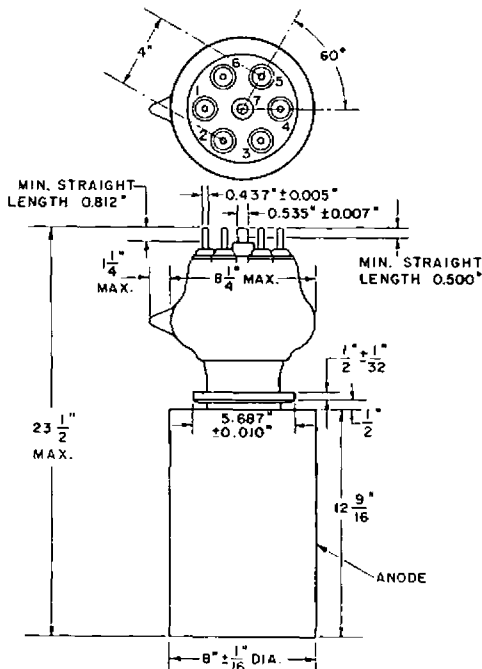
Filament Voltage:

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

Filament Current:

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

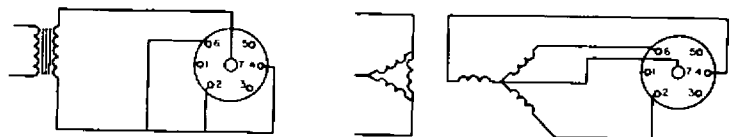
X-Ray Warning: The Maximum Ratings of the 7691 permit operation at voltages in excess of 16 KV. Therefore equipment design considerations should include the possible generation of soft x-rays.



FILAMENT CONNECTIONS

SINGLE PHASE AC SUPPLY

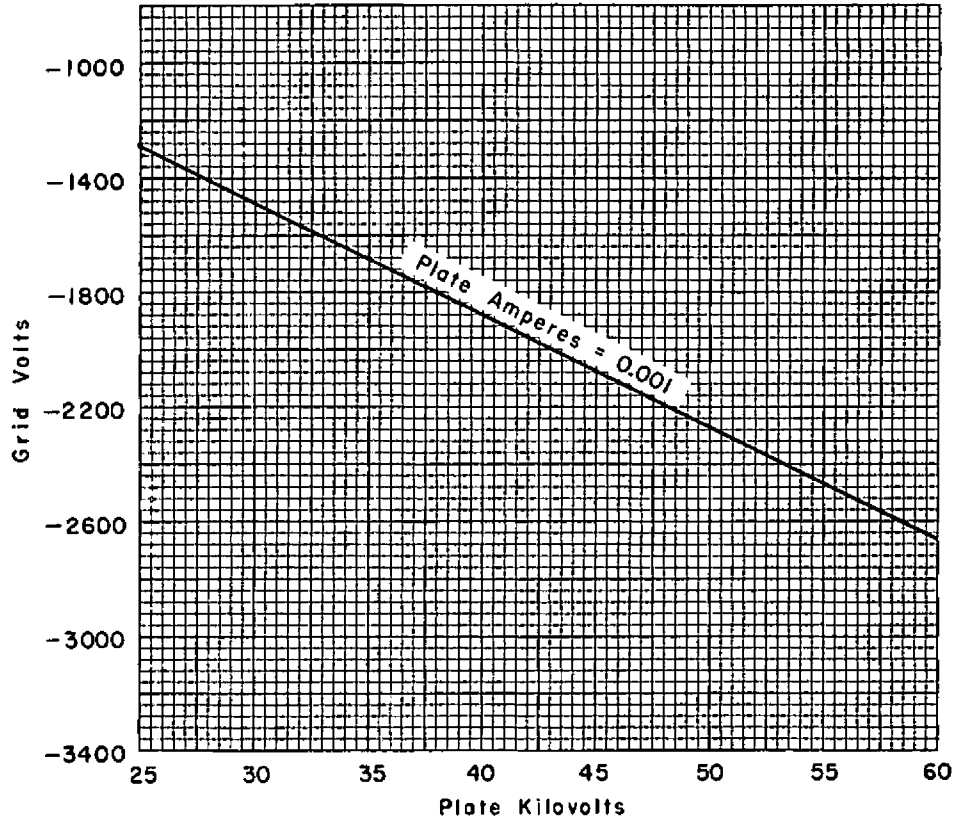
THREE PHASE AC SUPPLY



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

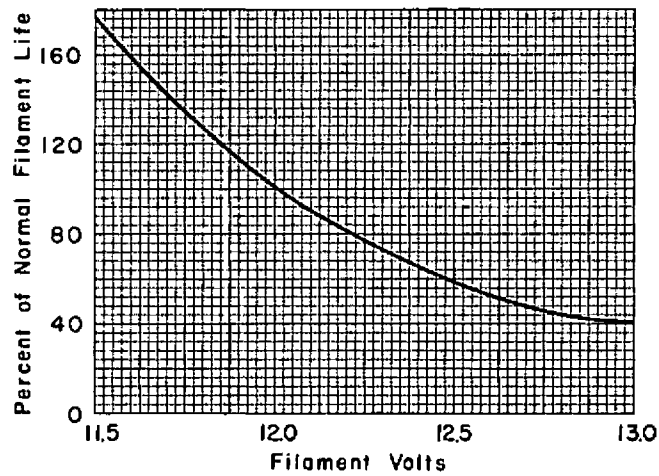
CE-A1521

HIGH VOLTAGE CUT-OFF CHARACTERISTICS

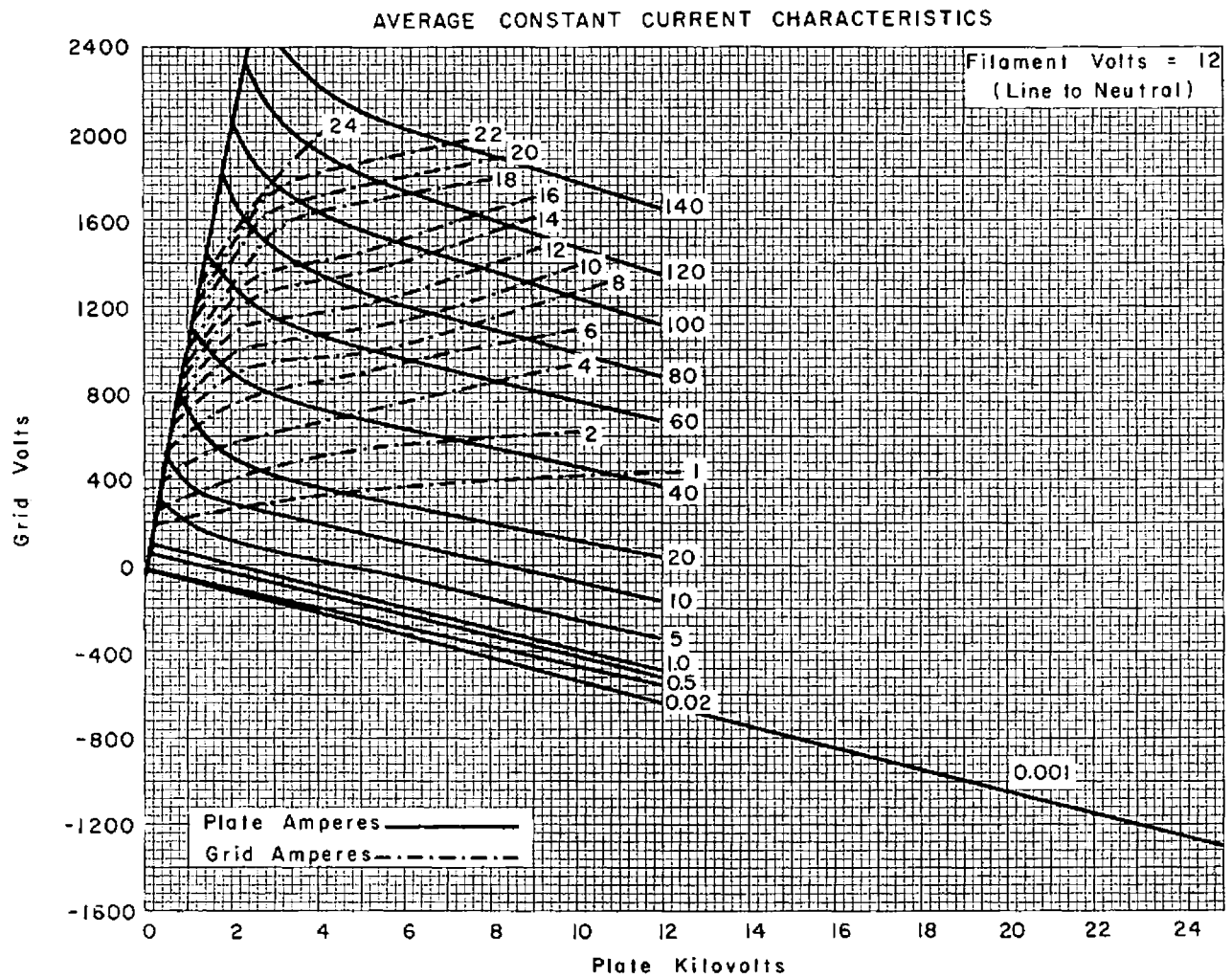


CE-A1518 R1

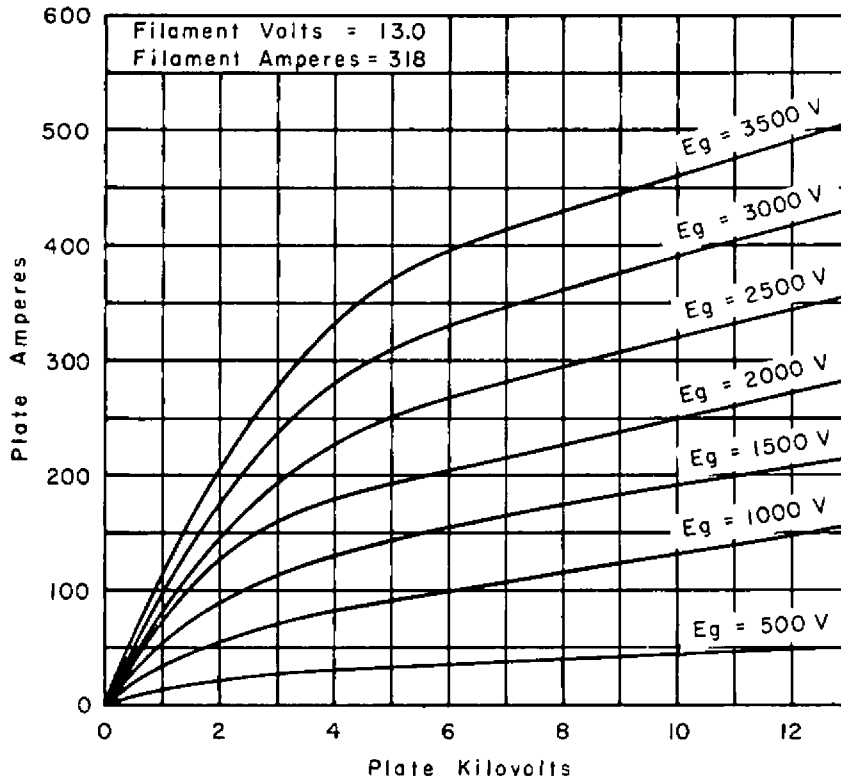
AVERAGE FILAMENT LIFE EXPECTANCY



CE-A1510 R1

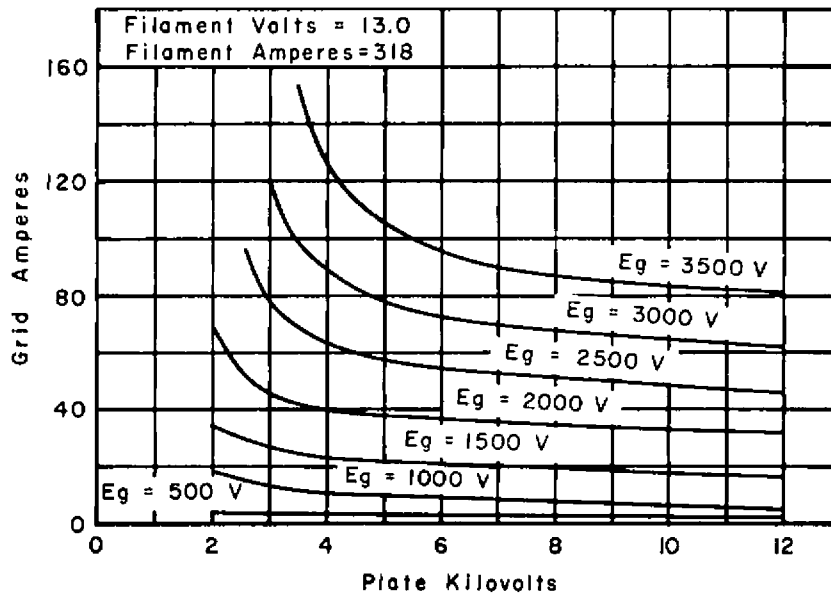


AVERAGE PLATE CHARACTERISTICS
(0.5 Microsecond Pulse Service)



CE-A1584

AVERAGE GRID CHARACTERISTICS
(0.5 Microsecond Pulse Service)



CE-A1583