

## HARD TUBE PULSE MODULATOR TYPE WL-7413

The WL-7413 is a large three-electrode, immersion cooled tube designed to deliver 9 megawatts peak pulse power as a hard-tube modulator. The anode is capable of dissipating 14 kilowatts, exclusive of filament heating power, when oil cooled or 50 kilowatts when water cooled. 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 . . . . .                   | 6 $\mu\mu\text{f}$                           |

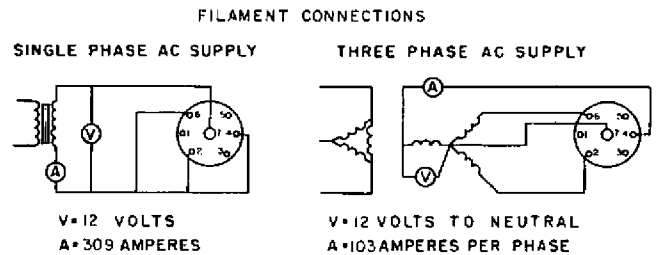
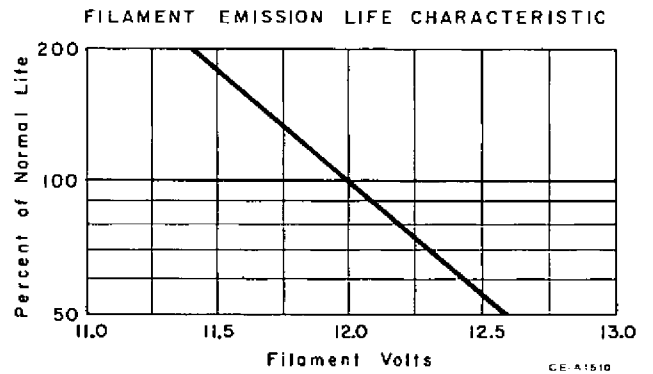
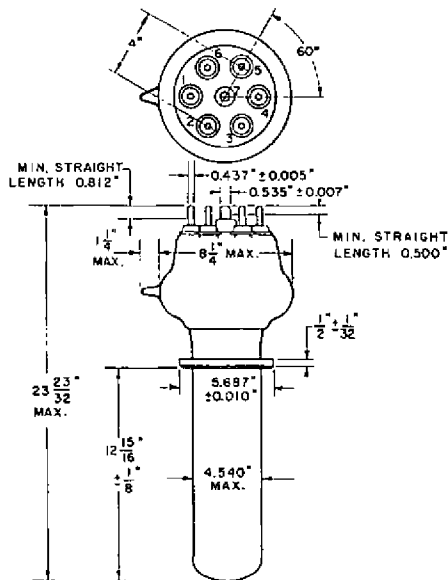
### MECHANICAL:

|   |                      |
|---|----------------------|
| Mounting Position . . . . .               | Vertical, Anode Down |
| Net Weight (approx.) . . . . .            | 25 Pounds            |
| Shipping Weight (approx.) . . . . .       | 90 Pounds            |
| Coaling:                                  |                      |
| Type . . . . .                            | Oil Water            |
| Maximum Fluid Temperature . . . . .       | 80 45 °C             |
| Maximum Bulb & Seal Temperature . . . . . | 180 180 °C           |
| Minimum Water Flow . . . . .              | 30 G.P.M.            |

### 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:                   |            |                     |
| Oil Cooled . . . . .                 | 14 max.    | Kilowatts           |
| Water Cooled . . . . .               | 50 max.    | Kilowatts           |
| Grid Dissipation . . . . .           | 1.0 max.   | Kilowatts           |
| Pulse Length . . . . .               | 1000 max.  | $\mu\text{seconds}$ |
| Duty Factor . . . . .                | 0.01 max.  |                     |
| Peak Pulse Cathode Current . . . . . | 200 max.   | Amperes             |

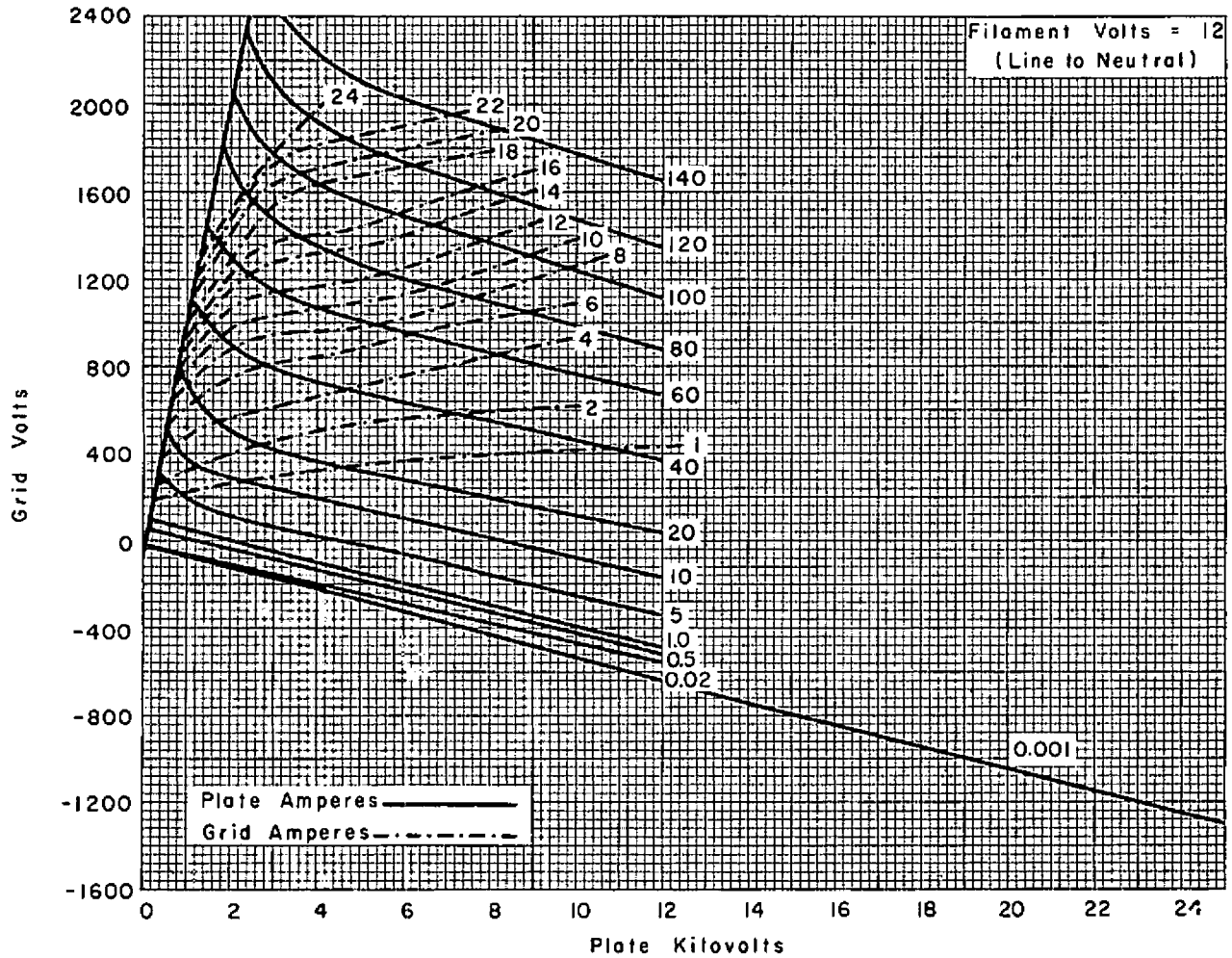
X-Ray Warning: The Maximum Ratings of the WL-7413 permit operation at voltages in excess of 16 KV. Therefore equipment design considerations should include the possible generation of soft x-rays.



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

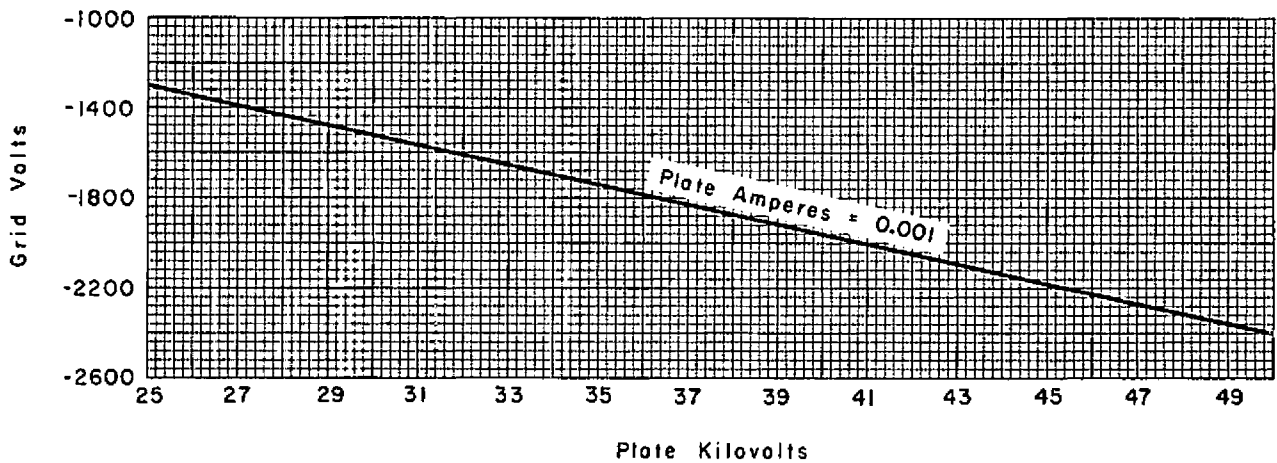
CC-11321

### AVERAGE CONSTANT CURRENT CHARACTERISTICS



CE-A1517

### HIGH VOLTAGE CUT-OFF CHARACTERISTIC



CE-A1518