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# AMPEREX TUBE TYPE 8270

same as ZT 1000

TENTATIVE DATA

The Amperex 8270 is a grid controlled mercury vapor half wave rectifier. It has a maximum PIV of 21 kv at an average anode current of 2.5 amps. At a PIV below 15 kv the anode current may rise to 3 amps. Six of these tubes in a three phase full wave circuit provide 12 kv at 9 amps.

## MECHANICAL

| | |
|---|---|
| Mounting Position | vertical, base down |
| Base | Super Jumbo, 4 pins, with bayonet |
| Accessories | |
| Socket | S-31747 |
| Anode Connector | S-31748 |
| Anode Cap (Supplied with the Tube) | S-31749 [1] |
| Dimensions | See outline drawing |
| Weight | |
| Net Weight | 1 lb. 1 oz. |
| Shipping Weight | 5 lbs. 1 oz. |

## ELECTRICAL

| | |
|---|---|
| Filament | Oxide-Coated |
| Heating | Direct |
| Filament Voltage [2] | 5 volts |
| Filament Current | 13.0 amps |
| Filament Warm-Up Time, Minimum [3] | 90 sec |
| Capacitances | |
| Anode to Grid | 4 pf |
| Grid to Cathode | 13 pf |
| Typical Characteristics | |
| Ionization Time | 10 $\mu$sec max |
| Deionization Time | 500 $\mu$sec max |
| Tube Voltage Drop ($I_b$ = 3 amps) | 12 volts |

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[1] This cap must always be mounted on the tube, also during preheating.

[2] A phase shift of 90° ± 30° between $E_b$ and $E_f$ and/or use of a center-tapped filament transformer is recommended.

[3] For average conditions, i.e. temperature within limits and proper distribution of mercury, See Table I.
After transport, a storage period, and also after a long interruption of operation a longer warm-up time is required before anode voltage may be applied. In general a time of 60 minutes will be sufficient to ensure proper distribution of the mercury.

# 8270

## MAXIMUM RATINGS, ABSOLUTE VALUES

| | | | |
|---|---|---|---|
| Frequency | 150 | 150 | 150 cps |
| Peak Anode Voltage | | | |
| Inverse | 21 | 15 | 2.5 kv |
| Forward | 21 | 15 | 2.5 kv |
| Anode Current | | | |
| Average | 2.5 | 3 | 5 amps [4] |
| Peak | 10 | 12 | 20 amps |
| Surge | 100 | 120 | 200 amps [5] |
| Grid Bias | 300 | 300 | 300 volts [6] |
| Grid Resistance | 100 | 100 | 100 k ohms max [7] |
| Grid Resistance | 10 | 10 | 10 k ohms min [7] |

TABLE I

| Peak Inverse Voltage | 21 | 15 | 10 | 2.5 | kv |
|---|---|---|---|---|---|
| Temperature of Condensed Mercury [8] | 25-45 | 25-55 | 25-60 | 27-75 | °C |
| Ambient Temperature [9, 10] | 15-30 | 15-35 | 15-40 | 15-55 | °C |

## TYPICAL OPERATION [11]

| | | |
|---|---|---|
| Grid Voltage ($E_b$ peak inverse 21 kv) | $E_{c1}$ | − 100 volts |
| ($E_b$ peak inverse 10 kv) | $E_{c1}$ | − 50 volts |
| Grid Current | $I_{c1}$ | 2 ma |

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[4] Averaging time $T_{av}$ = max. 30 sec.

[5] Max duration 0.1 sec.

[6] Direct voltage, before conduction.

[7] Recommended value: 33 k ohms

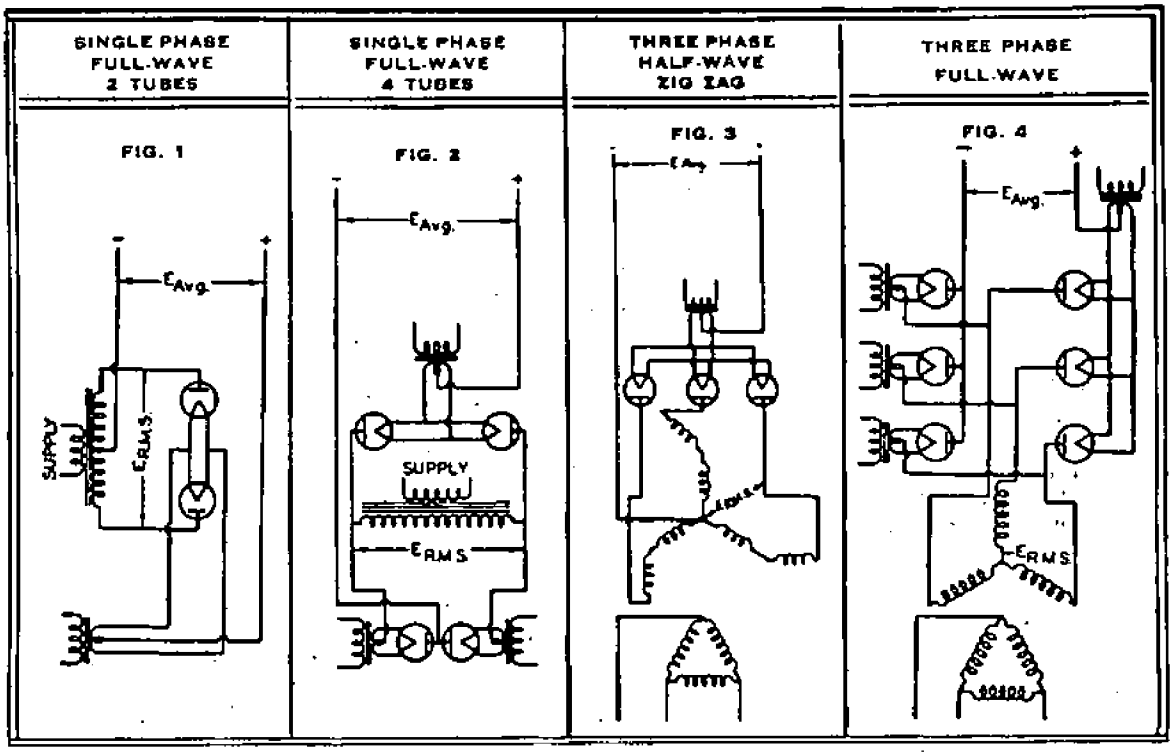
[8] If the equipment is started not more than twice daily, it is permissible to apply high voltage at a condensed-mercury temperature which is 5°C lower than the values mentioned in the table.

[9] With natural cooling, approximate values.

[10] The ambient temperature is defined as the temperature of the surrounding air and should be measured under the following conditions:

a. Normal atmospheric pressure
b. The tube should be adjusted to the worst possible operating conditions.
c. The temperature should be measured when thermal equilibrium is reached.
d. The distance from the thermometer to the outside of the envelope should be 3 inches (measured in a plane perpendicular to the main axis of the tube at the height of the condensed-mercury boundary).
e. The thermometer should be shielded against direct heat radiation.

[11] Transformer losses and voltage drops in tubes are neglected.




| Peak Inverse Voltage = 21 KV | | | | |
|---|---|---|---|---|
| | FIG. 1 | FIG. 2 | FIG. 3 | FIG. 4 |
| Transformer secondary Voltage kv. r.m.s. | 7.4 | 14.8 | 8.5 | 14.8 |
| Output Voltage kv | 6.7 | 13.4 | 10 | 20 |
| Output Current Amps | 5 | 5 | 7.5 | 7.5 |
| Output Power kw | 33.5 | 67 | 75 | 150 |
| Peak Inverse Voltage = 15 KV | | | | |
| Transformer Secondary Voltage kv r.m.s. | 5.3 | 10.6 | 6.1 | 10.6 |
| Output Voltage kv | 4.8 | 9.6 | 7.2 | 14.4 |
| Output Current Amps | 6 | 6 | 9 | 9 |
| Output Power kw | 28.8 | 57.6 | 64.8 | 130 |

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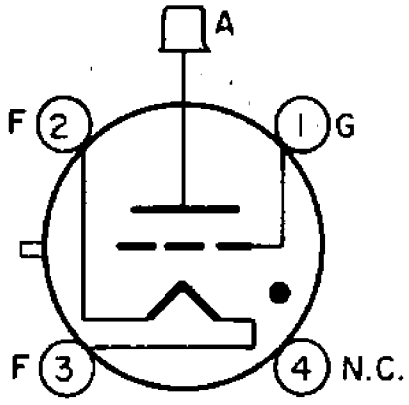
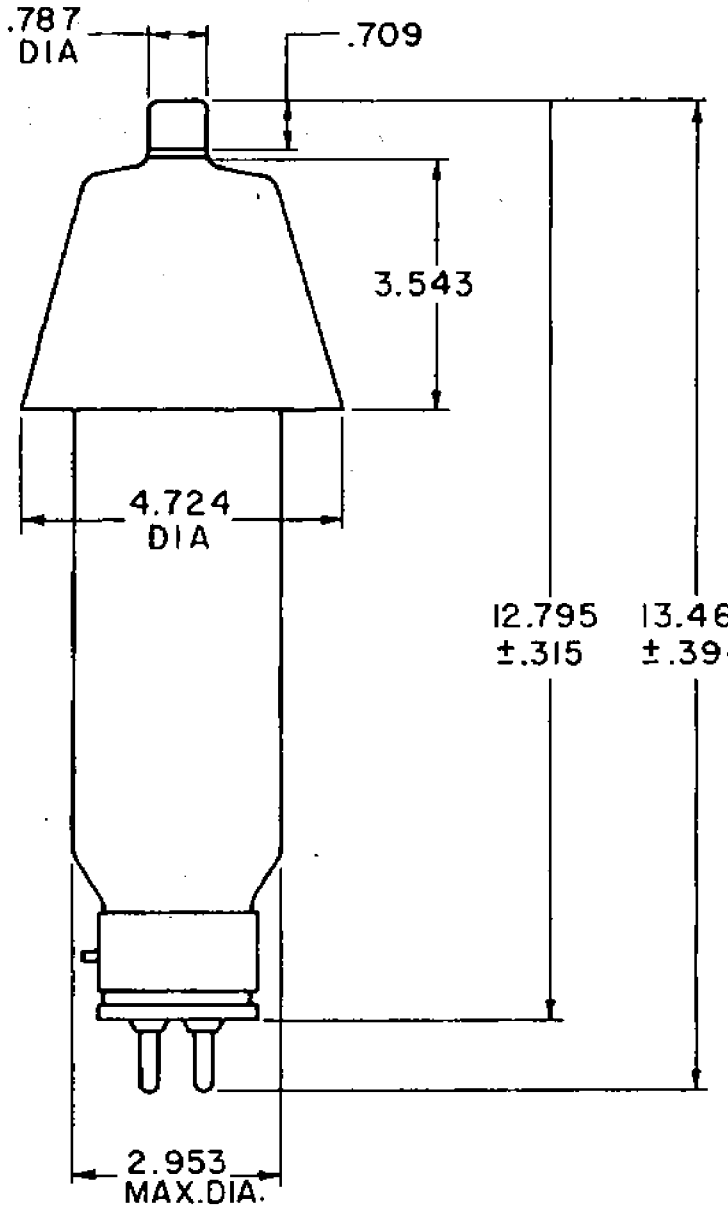
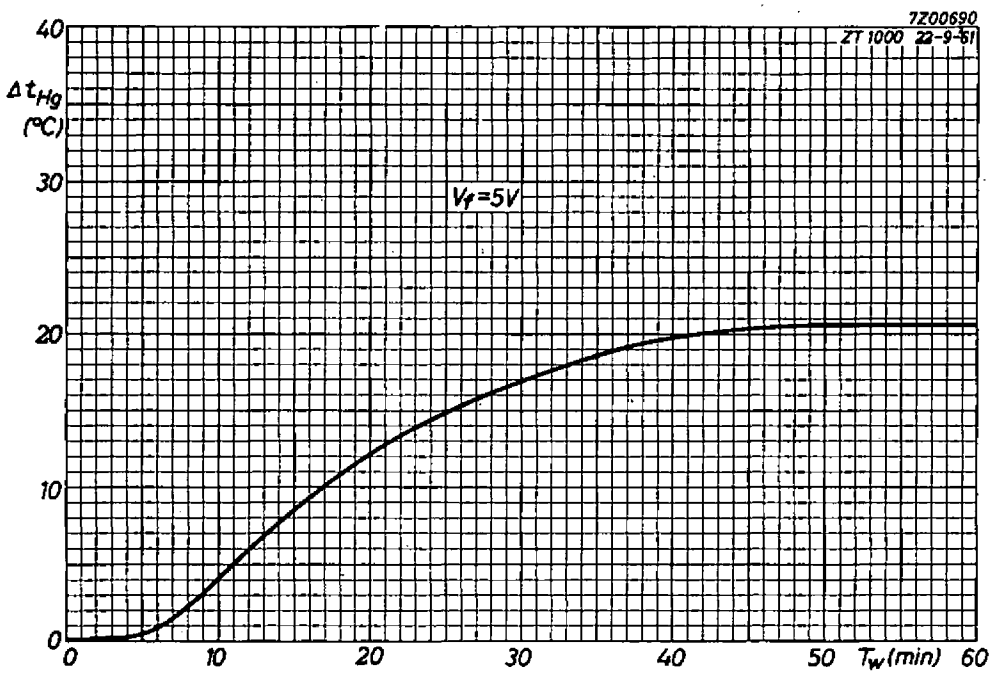


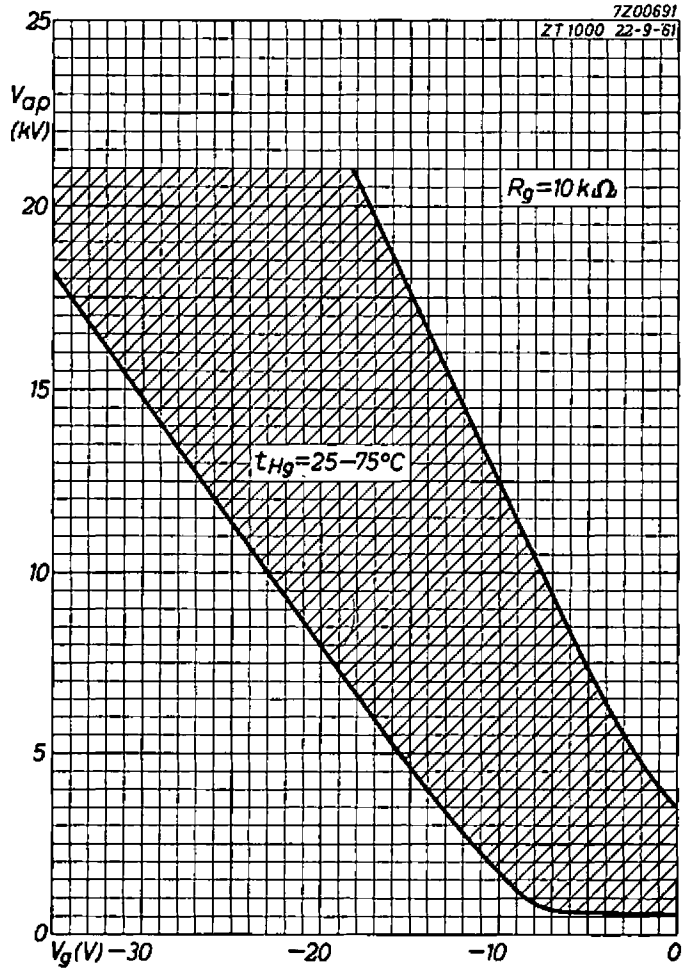

PIN CONNECTIONS

1. GRID
2. FILAMENT
3. FILAMENT
4. NO CONNECTION

CAP – ANODE




Rate of rise of condensed-mercury temperature




Control characteristics