



AMPEREX ELECTRONIC CORPORATION

230 DUFFY AVENUE

HICKSVILLE, L. I.

AMPEREX ELECTRON TUBE TYPE 5870

P.1

The 5870 is a three-electrode mercury-vapor rectifying tube with negative control characteristics. This tube is designed for grid-control rectifier applications of relatively high voltage and current. The cathode is directly heated, oxide-coated.

Maximum Ratings, Absolute Values:

Maximum Peak Anode Voltage

Inverse	27,000	10,000	volts
Forward	27,000	10,000	volts

Condensed Mercury

Temperature Limits	+ 30 to + 40	+ 25 to + 60	centigrade
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Maximum Plate Current

Peak		10	amperes
Average		2.5	amperes
Surge, for design only (Maximum duration 0.1 seconds)		100	amperes
Maximum Averging time		30	seconds

Maximum Negative Control-Grid Voltage Before Conduction

300 volts

Maximum Positive Control-Grid Current

Average (Averaging time, one cycle)	25	ma
Peak	125	ma

Maximum Grid Resistance

0.1 megohms

Frequency Range

25 to 150 cps

GENERAL

Electrical Data

	Min.	Bogey	Max.	
Filament Voltage	4.75	5.0	5.25	volts
Filament Current at 5.0 volts	---	14	16	amperes
Filament Heating Time* (before applying Plate Voltage)	120	---	---	seconds
Anode-to-control-grid Capacitance	---	4	---	uuf
Control-grid-to cathode Capacitance	---	13	---	uuf
Deionization Time, approximate	---	250	---	microseconds
Ionization Time, approximate	---	10	---	microseconds
Typical Bias at 21,000 volts			-100	volts
Typical Bias at 10,000 volts			-50	volts
Typical Grid Current (Average)			2	ma
Typical Grid Resistance			10,000	ohms
Tube Voltage Drop (I _b = 10 amperes)			14	volts

The minimum heating time refers only to the filament. Sufficient additional time must be allowed to permit the condensed mercury temperature to rise to the minimum condensed mercury temperature limit and to permit all the mercury to condense in the lower part of the tube.

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Type of cooling - Convection

Equilibrium Condensed-Mercury Temperature Rise

At Full Load, approximate

15 °C

At No Load, approximate

13 °C

Mounting position - Vertical with base down

Net Weight, approximate

28 ounces

OPERATIONAL NOTES

Note 1: In order to obtain maximum life from the tube it is recommended that a filament voltage phase shift of 90° be applied with respect to plate voltage.

Note 2: Characteristic Curves

The circuit returns are connected to the center tap of the filament transformer.

Note 3: General Control Characteristic Curve

The band width illustrated in this curve includes the unavoidable variations in the characteristics of a mercury thyratron. These include:

1. Shift due to condensed mercury temperature variation within the rated range.
2. Shift caused by filament voltage variation.
3. Differences from tube to tube due to manufacturing variances.
4. Shift due to aging effects within the guaranteed life period.

Note 4: The minimum heating time refers only to the filament. Sufficient additional time must be allowed to permit the condensed mercury temperature to rise to the minimum condensed mercury temperature limit and to permit all the mercury to condense in the lower part of the tube.

CIRCUIT	INPUT VOLTAGE RMS VALUE (KV)	D.C. OUTPUT VOLTAGE (KV)	D.C. OUTPUT CURRENT (AMPS)
SINGLE-PHASE, FULL WAVE 2 TUBES	9.5	8.6	5
THREE-PHASE, HALF WAVE 3 TUBES	11	12.9	7.5
THREE-PHASE, DOUBLE-Y PARALLEL 6 TUBES	11	12.9	15
FOUR-PHASE, HALF WAVE 4 TUBES	9.5	12.1	10
SINGLE-PHASE, FULL WAVE 4 TUBES	19.1	17.1	5
THREE-PHASE, FULL WAVE 6 TUBES	19.1	25.8	7.5
FOUR-PHASE, FULL WAVE 8 TUBES	19.1	24.3	10

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