5BC3A

Full-Wave Vacuum Rectifier

NOVAR TYPE

For Power Supplies of Equipment Having High DC Power Output Requirements

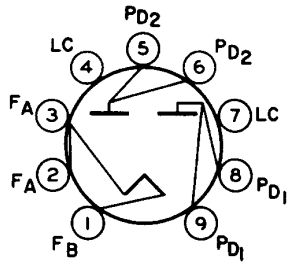
Electrical:

Filament Characteristics and Ratings:		
Voltage (AC)	5.0 ± 0.5	volts
Current at filament volts = 5.0	3.000	amp

Mechanical:

Operating Position	Vertical, base down or up, or Horizontal with pins 2 and 7 in vertical plane
Maximum Overall Length	3.880"
Seated Length	3.250" to 3.500"
Diameter	1.438" to 1.562"
Dimensional Outline (JEDEC No.12-99)	See *General Section*
Bulb	T12
Base	Large-Button Novar 9-Pin with Exhaust Tip (JEDEC No.E9-88)
Basing Designation for BOTTOM VIEW	9QJ

Pin 1 – Filament End B
Pin 2 – Filament End A
Pin 3 – Filament End A
Pin 4 – See Note
Pin 5 – Plate No.2
Pin 6 – Plate No.2
Pin 7 – See Note
Pin 8 – Plate No.1
Pin 9 – Plate No.1



Note: May be used as tie point for ac line providing the peak value of the ac voltage does not exceed 200 volts.

FULL-WAVE RECTIFIER

Maximum Ratings, *Design-Maximum Values:*

Peak Inverse Plate Voltage	1700	volts
AC Plate Supply Voltage Per Plate (RMS, without load)	See accompanying *Rating Chart I*	
Peak Plate Current Per Plate	1	amp
Hot-Switching Transient Plate Current per plate[a]	5	amp
DC Output Current	See accompanying *Rating Chart I*	

Typical Operation:

With capacitor-input filter

AC Plate-to-Plate Supply Voltage (RMS, without load)	600	900	1100	volts
Filter-Input Capacitor[b]	40	40	40	μf
Total Effective Plate Supply Impedance Per Plate	21	67	97	ohms

DC Output Voltage (Approx.) at input to filter at load ma =				
300	290	–	–	volts
275	–	460	–	volts
162	–	–	630	volts
150	335	–	–	volts
137.5	–	520	–	volts
81	–	–	680	volts
With choke-input filter				
AC Plate-to-Plate Supply Voltage (RMS, without load)	900	1100		volts
Filter-Input Choke	10	10		henrys
DC Output Voltage at input to filter (Approx.) at load ma =				
348	340	–		volts
275	–	440		volts
174	355	–		volts
137.5	–	455		volts

[a] Even occasional hot-switching with capacitor-input circuits permits the flow of plate current having magnitudes which can adversely affect the life and reliability of rectifier tubes. If capacitor-input circuits are to be used, protect the circuits against the adverse effects of possible hot-switching, and do not exceed a hot-switching transient plate current per plate of 5 amperes during the initial cycles of the hot-switching transient. If hot-switching is required in operation, the use of choke-input circuits is recommended. Such circuits limit the hot-switching current to a value no higher than that of the peak plate current.

[b] Values of capacitance higher than those indicated may be used, provided the effective plate supply impedance is increased to prevent exceeding the maximum peak-plate-current rating.

RATING CHARTS and OPERATION CHARACTERISTICS

Rating Chart I represents graphically the relationships between maximum ac voltage input and maximum dc output current derived from the fundamental ratings for conditions of capacitor-input and choke-input filters. This graphical presentation gives the equipment designer considerable latitude in choice of operating conditions.

Rating Chart II represents graphically the relationship between maximum rectification efficiency and maximum dc output current per plate for conditions of capacitor-input filter.

A choice of operating values of dc output current per plate and rectification efficiency should be made such that they fall within the area of permissible operation to insure that the maximum peak-plate-current rating will not be exceeded. If the operating values chosen fall outside the permissible operating area, a different choice of parameters should be made. For a given value of ac voltage input and dc output current, it is possible to reduce the rectification efficiency either by increasing the plate supply resistance per plate or by using a smaller value of input filter capacitor.

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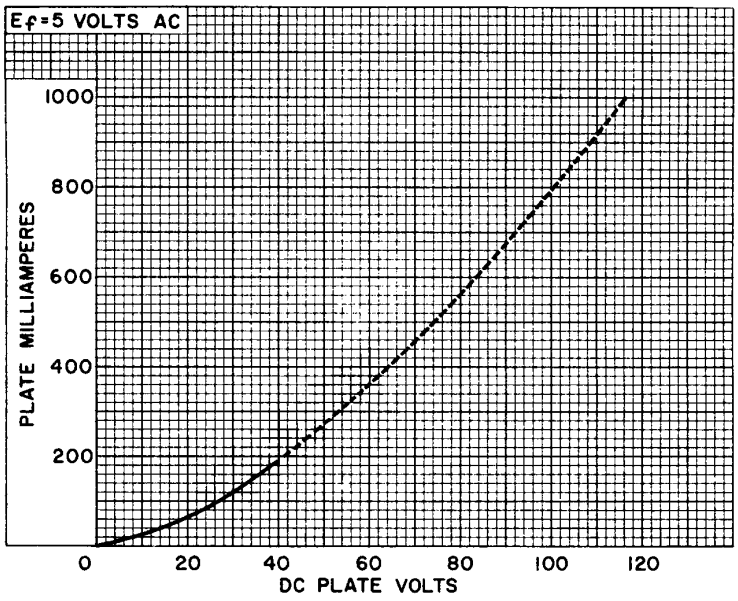
Rating Chart III represents graphically the relationships between minimum effective plate supply resistance per plate and maximum ac plate supply voltage per plate under no-load conditions of capacitor-input filter when occasional hot-switching is employed.

If occasional hot-switching is required with capacitor-input circuits, it is important to protect the tube and the circuits against the flow of plate currents having magnitudes in excess of the maximum hot-switching-current rating of 5 amperes. To limit the hot-switching current, adequate series plate supply resistance per plate is necessary. This resistance value may be determined with the formula shown in legend of *Rating Chart III*. To insure that the maximum hot-switching current is not exceeded, the value of series plate supply resistance per plate should be equal to or greater than the minimum value indicated by the curve.

If appreciable series inductance is present in the plate supply, a value of series plate supply resistance smaller than that indicated by the curve may be employed provided it is experimentally determined that the combined effect of inductance and plate supply resistance used are adequate to limit the hot-switching current to the indicated maximum-rated value.

AVERAGE PLATE CHARACTERISTIC
Each Plate



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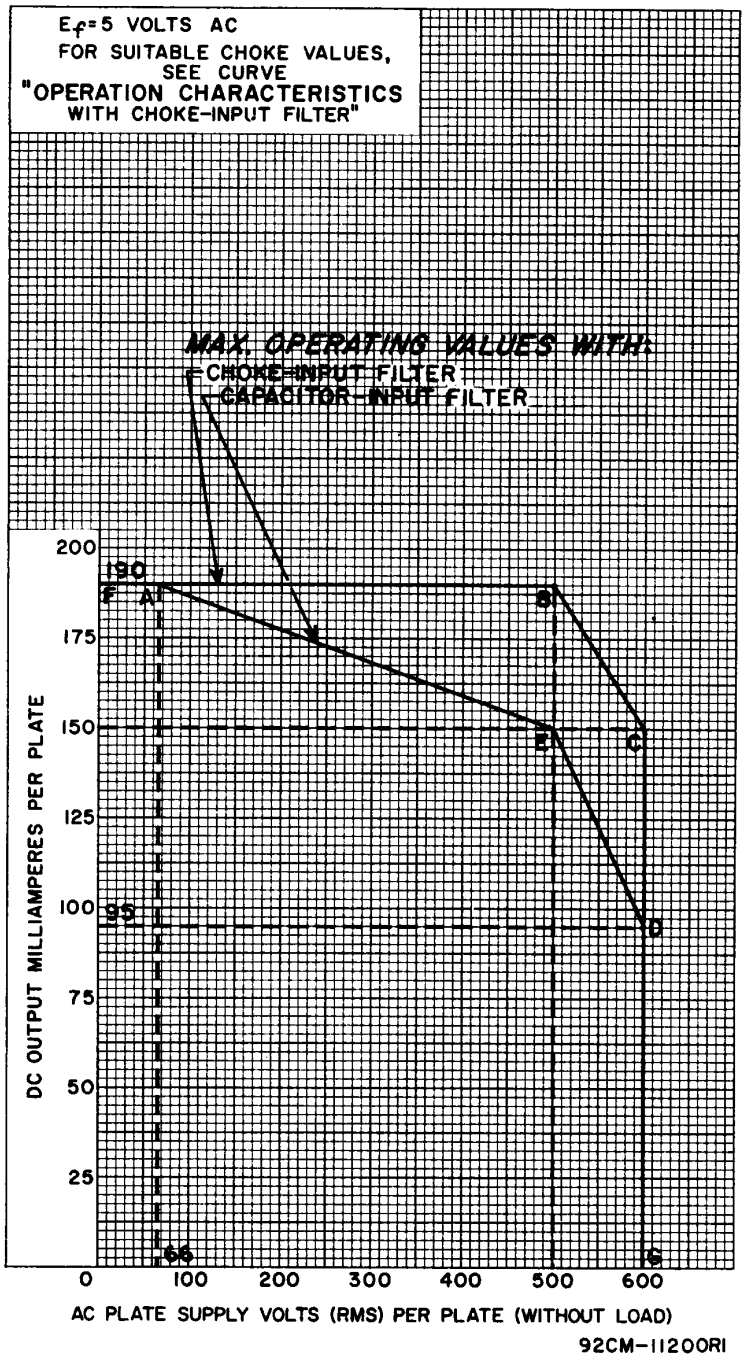
RATING CHART I



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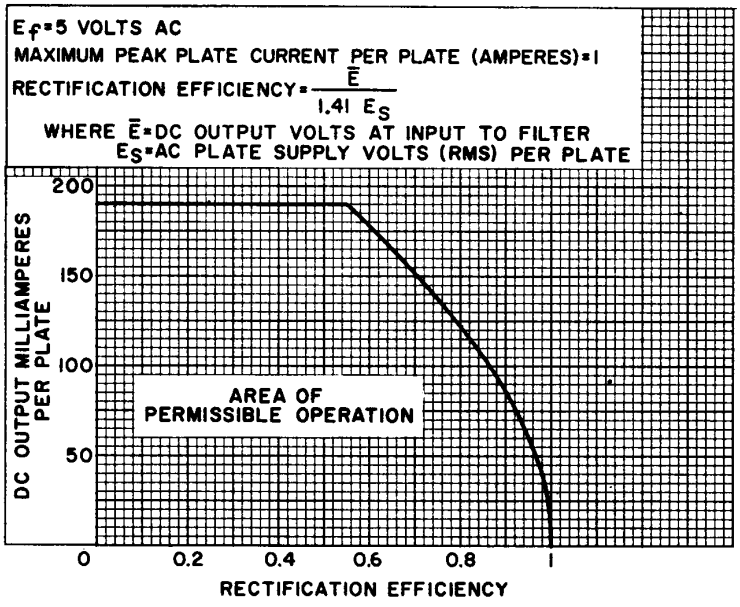
RATING CHART II
Capacitor-Input Filter



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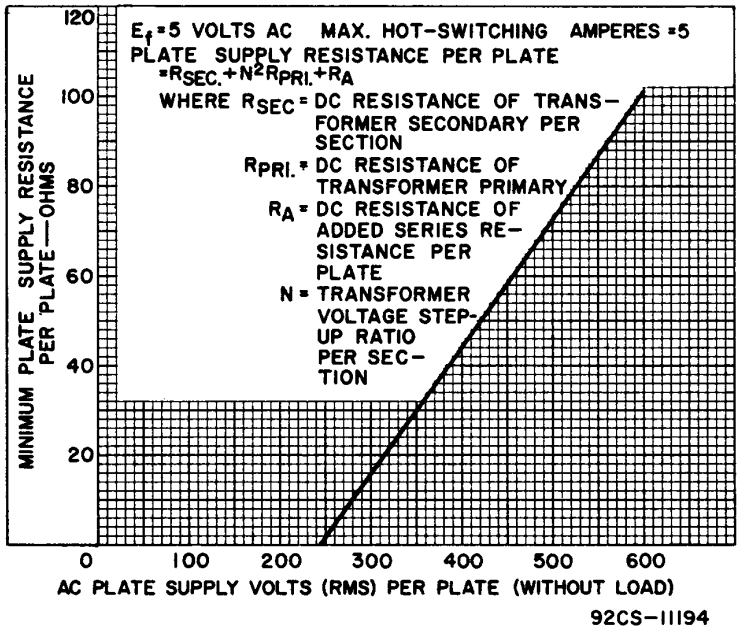
RATING CHART III
Capacitor-Input Filter



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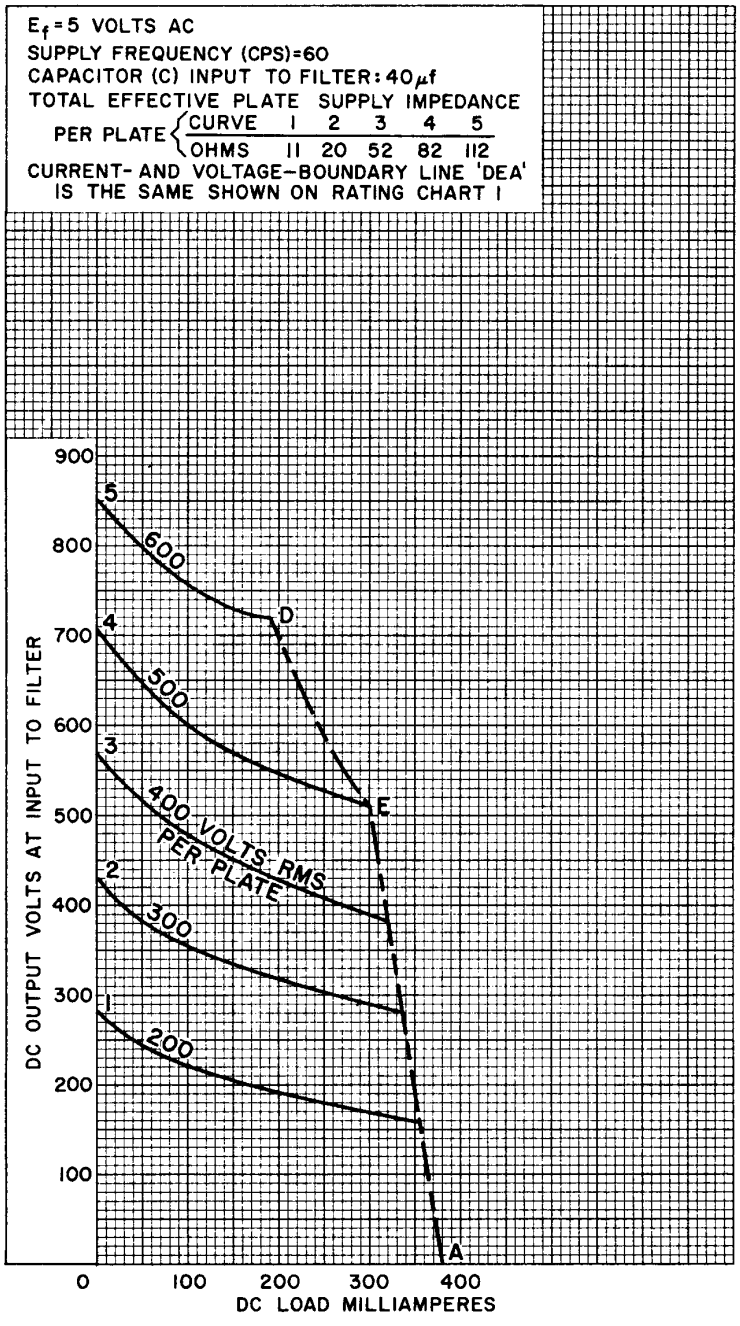
OPERATION CHARACTERISTICS
Full-Wave Circuit, Capacitor-Input Filter



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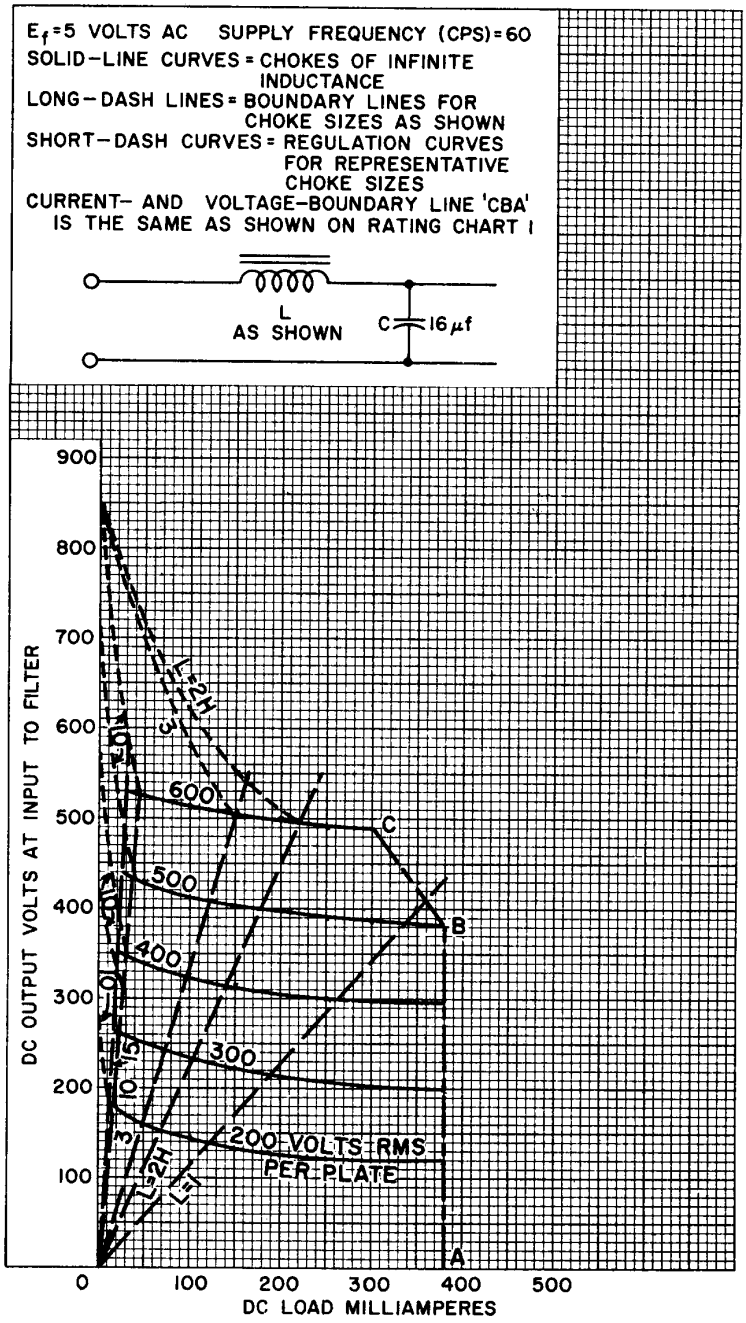
OPERATION CHARACTERISTICS
Full-Wave Circuit, Choke-Input Filter



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