

Full-Wave Vacuum Rectifier

NOVAR TYPE

For Power Supplies Having High DC Output

GENERAL DATA

Electrical:

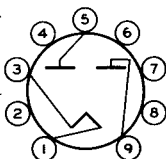
Filament, Coated:

Voltage (AC or DC) $5 \pm 10\%$ volts
 Current at 5 volts. 3 amp

Mechanical:

Operating Position. Vertical, base down or up, or
 Horizontal with pins 2 and 7 in vertical plane
 Maximum Overall Length. 4.14"
 Maximum Seated Length 3.76"
 Length, Base Seat to Bulb Top (Excluding tip). . . 3.20" \pm 0.09"
 Diameter. 1.438" to 1.562"
 Bulb. T12
 Socket. Cinch Mfg. Corp. No.149 19 00 024, or equivalent
 Base. Large-Button Novar 9-Pin (JEDEC No.E9-76)
 Basing Designation for BOTTOM VIEW. 9NT

Pin 1 - Filament	Pin 6 - Internal Connection—Do Not Use
Pin 2 - Internal Connection—Do Not Use	Pin 7 - Internal Connection—Do Not Use
Pin 3 - Filament	Pin 8 - Internal Connection—Do Not Use
Pin 4 - Internal Connection—Do Not Use	Pin 9 - Plate No.1
Pin 5 - Plate No.2	



FULL-WAVE RECTIFIER

Maximum Ratings, Design-Maximum Values:

PEAK INVERSE PLATE VOLTAGE. 1700 max. volts
 AC PLATE SUPPLY VOLTAGE PER PLATE (RMS, without load) See *Rating Chart I*
 PEAK PLATE CURRENT PER PLATE. 1 max. amp
 HOT-SWITCHING TRANSIENT PLATE CURRENT PER PLATE^a. 5 max. amp
 DC OUTPUT CURRENT See *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	μ f
Total Effective Plate Supply Impedance Per Plate	21	67	97	ohms



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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.

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



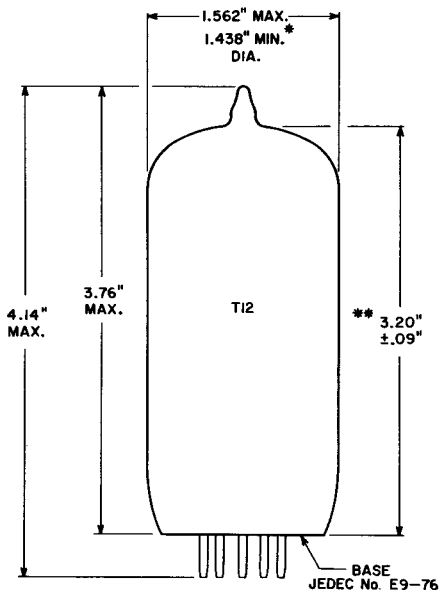
conditions of capacitor-input filter when occasional hot-switching is employed.

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.



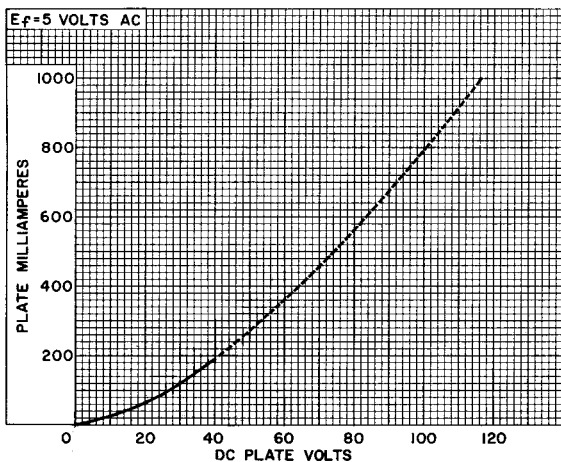
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* APPLIES IN ZONE STARTING 0.375" FROM BASE SEAT.

** MEASURED FROM BASE SEAT TO BULB-TOP LINE AS DETERMINED BY A RING GAUGE OF 0.600" INSIDE DIAMETER.

AVERAGE PLATE CHARACTERISTIC
Each Plate

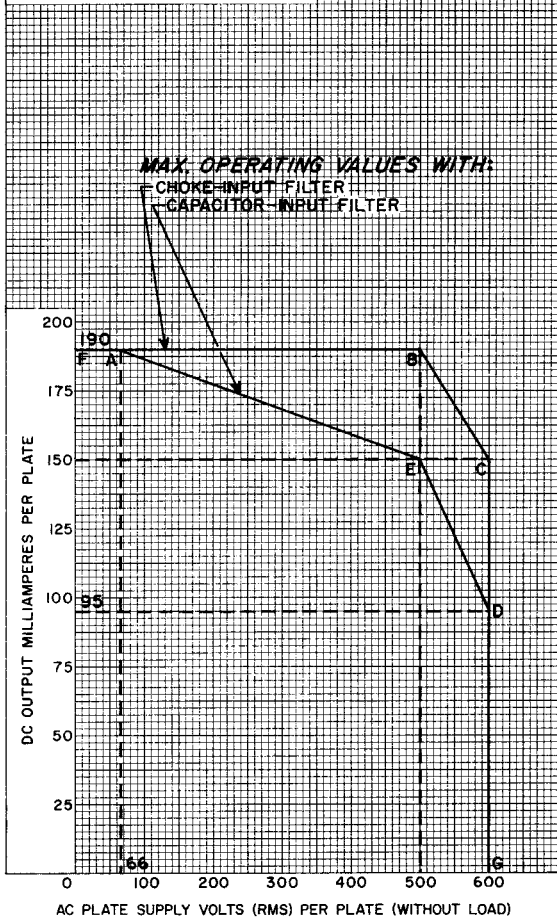
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RATING CHART I

$E_f = 5$ VOLTS AC
 FOR SUITABLE CHOKE VALUES,
 SEE CURVE
 "OPERATION CHARACTERISTICS
 WITH CHOKE-INPUT FILTER"

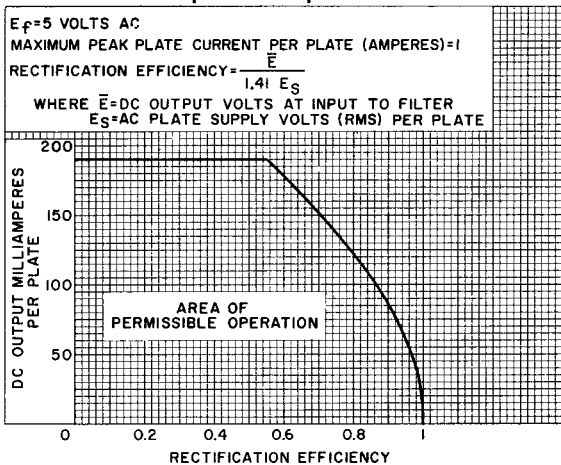
MAX. OPERATING VALUES WITH:
 — CHOKE-INPUT FILTER
 — CAPACITOR-INPUT FILTER



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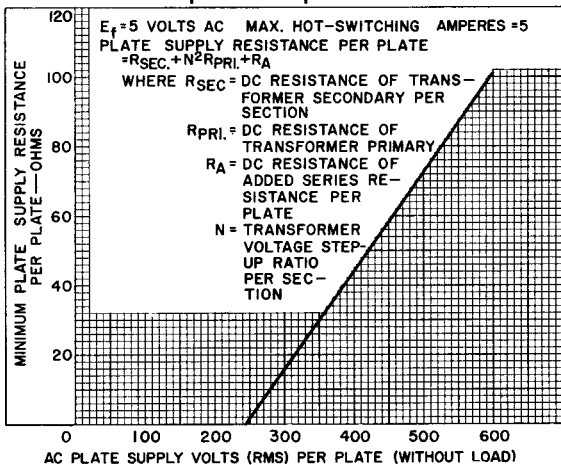


RATING CHART II Capacitor-Input Filter



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RATING CHART III Capacitor-Input Filter

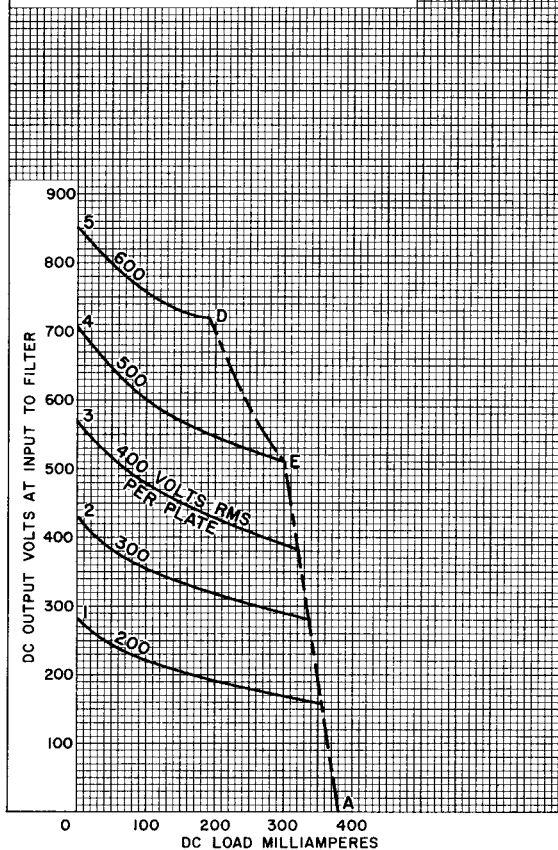


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OPERATION CHARACTERISTICS Full-Wave Circuit, Capacitor-Input Filter

$E_f = 5$ VOLTS AC
 SUPPLY FREQUENCY (CPS) = 60
 CAPACITOR (C) INPUT TO FILTER: $40\mu f$
 TOTAL EFFECTIVE PLATE SUPPLY IMPEDANCE
 PER PLATE { CURVE 1 2 3 4 5
 OHMS 11 20 52 82 112
 CURRENT- AND VOLTAGE-BOUNDARY LINE 'DEA'
 IS THE SAME SHOWN ON RATING CHART I



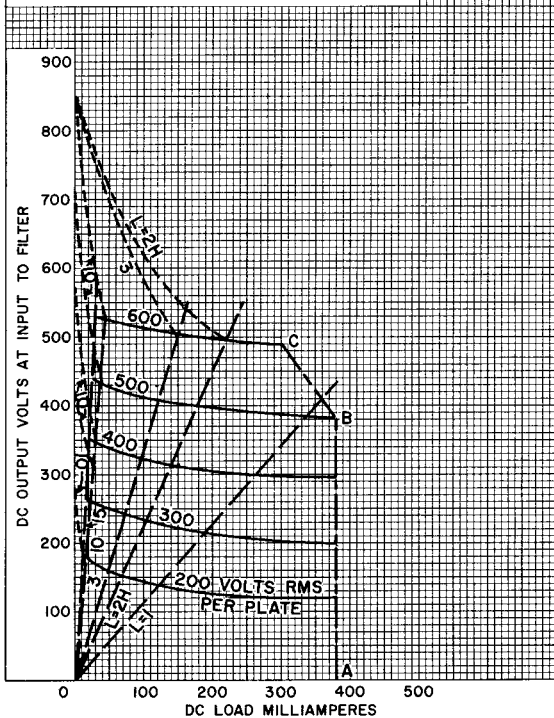
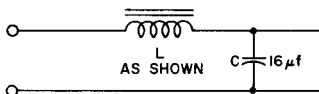
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OPERATION CHARACTERISTICS

Full-Wave Circuit, Choke-Input Filter

$E_f = 5$ VOLTS AC SUPPLY FREQUENCY (CPS) = 60
 SOLID-LINE CURVES = CHOKES OF INFINITE INDUCTANCE
 LONG-DASH LINES = BOUNDARY LINES FOR CHOKES AS SHOWN
 SHORT-DASH CURVES = REGULATION CURVES FOR REPRESENTATIVE CHOKES
 CURRENT- AND VOLTAGE-BOUNDARY LINE 'CBA' IS THE SAME AS SHOWN ON RATING CHART I



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