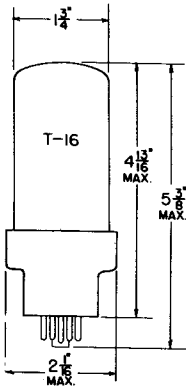


**TUNG-SOL**

**FULL WAVE RECTIFIER**



**GLASS BULB**  
HARD GLASS

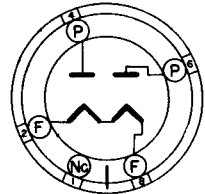
FILAMENT

5.0 VOLTS 2.0 AMP.

AC OR DC

**VERTICAL MOUNTING POSITION**

TUBE MAY BE OPERATED IN HORIZONTAL POSITION IF PINS #1 AND #4 ARE IN VERTICAL PLANE.



**BOTTOM VIEW**  
SPECIAL SKIRTED  
5 PIN OCTAL

5T

THE 5R4WGB IS A LONG LIFE, RUGGEDIZED, RELIABLE FULL WAVE RECTIFIER TUBE. WHILE SIMILAR IN CONSTRUCTION TO THE POPULAR 5R4WGA, THIS TUBE IS SUBJECTED TO MORE EXACTING REQUIREMENTS IN MANUFACTURE. THIS INCLUDES A 100% CHECK OF WELDS UNDER MAGNIFICATION. EVERY TUBE IS ELECTRICALLY STABILIZED WITH REPEATED COLD STARTS TO WEED OUT TUBES THAT ARE PRONE TO ARCING. THE 5R4WGB IS MADE IN "LOTS" WITH AN ENTIRE LOT BEING REJECTED UPON THE REJECTION OF SAMPLE TUBES. THIS IS OF PARTICULAR IMPORTANCE ON DESTRUCTIVE TESTS.

ONE OF THE DESIGN FEATURES IS THE SHOCK MOUNTING OF THE BULB IN A SKIRTED TYPE BASE BY A RESILIENT SILICONE RUBBER. THUS, ALTHOUGH THE BASE MAY BE SECURELY CLAMPED TO THE CHASSIS, THE TUBE PROPER IS INSULATED AGAINST SHOCKS. THIS TYPE OF BASING ALSO PERMITS OPERATION AT HIGH ALTITUDES WITHOUT FLASH OVER. ANOTHER DESIGN FEATURE IS THE "CROSS PRESS" STEM WHICH KEEPS ELECTROLYSIS TO A MINIMUM WHILE OFFERING A STABLE SUPPORT FOR THE MOUNT STRUCTURE. THE USE OF A HARD GLASS BULB PERMITS THE TUBE TO BE PROCESSED AT HIGH TEMPERATURES DURING MANUFACTURE SO THAT IT WILL REMAIN GAS FREE UNDER THE HIGH TEMPERATURES ENCOUNTERED IN OPERATION. THE LOW DRAIN, FAST HEATING, RUGGED FILAMENT PERMITS INSTANT APPLICATION OF PLATE VOLTAGE OVER A LARGE PORTION OF THE OPERATING CHARACTERISTICS. (SEE CURVES).

**ELECTRICAL DATA**

FILAMENT VOLTAGE (± 10%) A.C.	5.0	VOLTS
FILAMENT CURRENT A.C.	2.0	AMPS.

CONTINUED ON FOLLOWING PAGE

## TUNG-SOL

CONTINUED FROM PRECEDING PAGE

## TYPICAL OPERATION

	INPUT TO FILTER		
	CHOKE	CAPACITOR	
AC PLATE VOLTAGE RMS PER PLATE	900	700	VAC
INPUT CONDENSER	---	4	mfd
INPUT CHOKE	10	---	H
EFFECTIVE PLATE SUPPLY IMPEDANCE PER PLATE	---	100	OHMS
DC OUTPUT CURRENT	165	275	MA.
DC OUTPUT VOLTAGE AT FULL LOAD	840	730	VDC
DC OUTPUT VOLTAGE AT HALF LOAD	860	800	VDC
REGULATION, HALF LOAD TO FULL LOAD	20	70	VDC

## MECHANICAL DATA

MOUNTING POSITION	VERTICAL	
MAXIMUM OVERALL HEIGHT	5.31	INCHES
MAXIMUM SEATED HEIGHT	4.75	INCHES
MAXIMUM DIAMETER	2.06	INCHES
BULB, HARD GLASS	T-16	
BASE: SPECIAL SKIRTED OCTAL 5 PIN, GLASS FILLED ALKYD, INSULATION ZONE 5 OR BETTER.	SEE OUTLINE	

## MAXIMUM RATING CHART

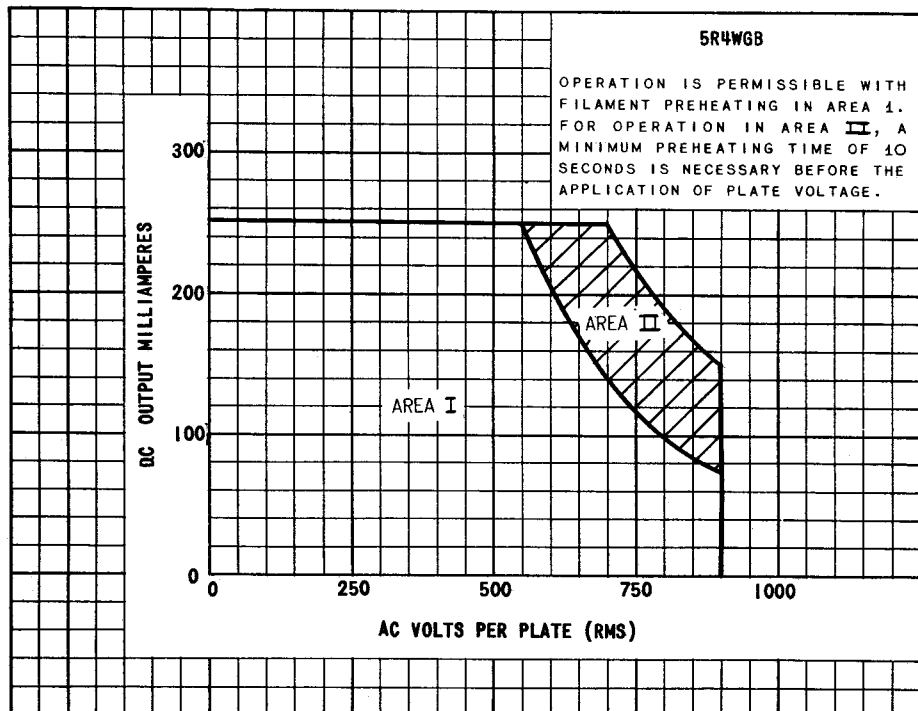
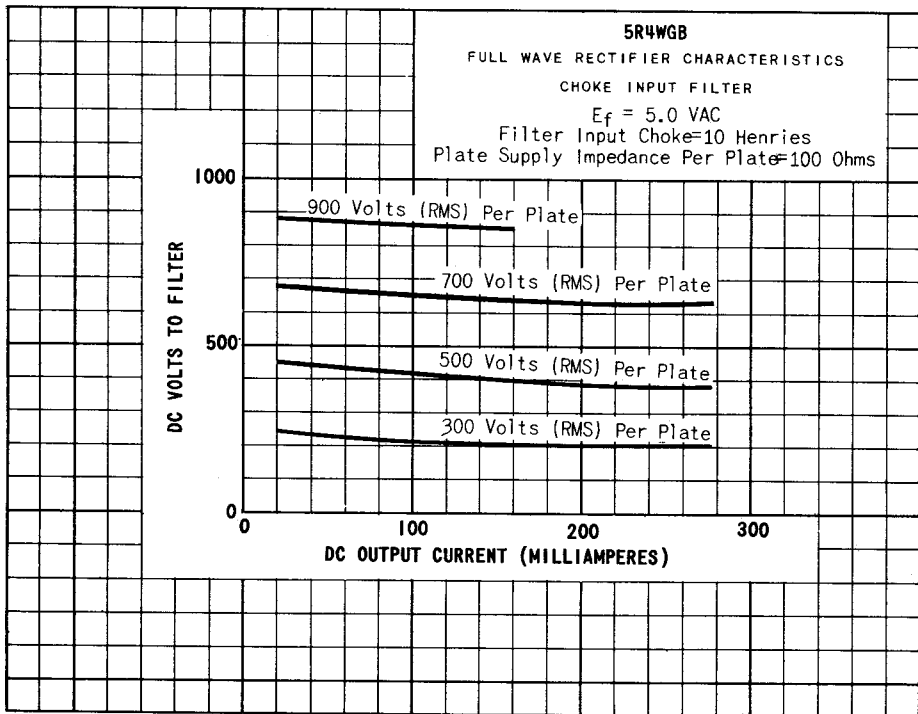
ALTITUDE	FILTER INPUT	PEAK INV. VOLTAGE	VOLTS RMS PER PLATE	MIN. SUPPLY IMPEDANCE PER PLATE
UP TO 30,000 FT.	4 $\mu$ f	3050v <sup>Ⓢ</sup>	1070v	575 $\Omega$ <sup>Ⓢ</sup>
UP TO 40,000 FT.	4 $\mu$ f	2150 <sup>Ⓢ</sup>	760	---
	5 HENRIES	2300 <sup>Ⓢ</sup>	815	---
UP TO 60,000 FT.	4 $\mu$ f	2800 <sup>Ⓢ</sup>	990	575 <sup>Ⓢ</sup>
	4 $\mu$ f	1850 <sup>Ⓢ</sup>	655	---

ALTITUDE	PEAK PLATE CURRENT	CURRENT	FULL LOAD VOLTAGE
UP TO 30,000 FT.	0 MA. <sup>Ⓢ</sup>	0 MA. <sup>Ⓢ</sup>	1525v
UP TO 40,000 FT.	700 <sup>Ⓢ</sup>	275 <sup>Ⓢ</sup>	770
	---	275 <sup>Ⓢ</sup>	650
UP TO 60,000 FT.	550 <sup>Ⓢ</sup>	165 <sup>Ⓢ</sup>	1100
	700 <sup>Ⓢ</sup>	275 <sup>Ⓢ</sup>	620

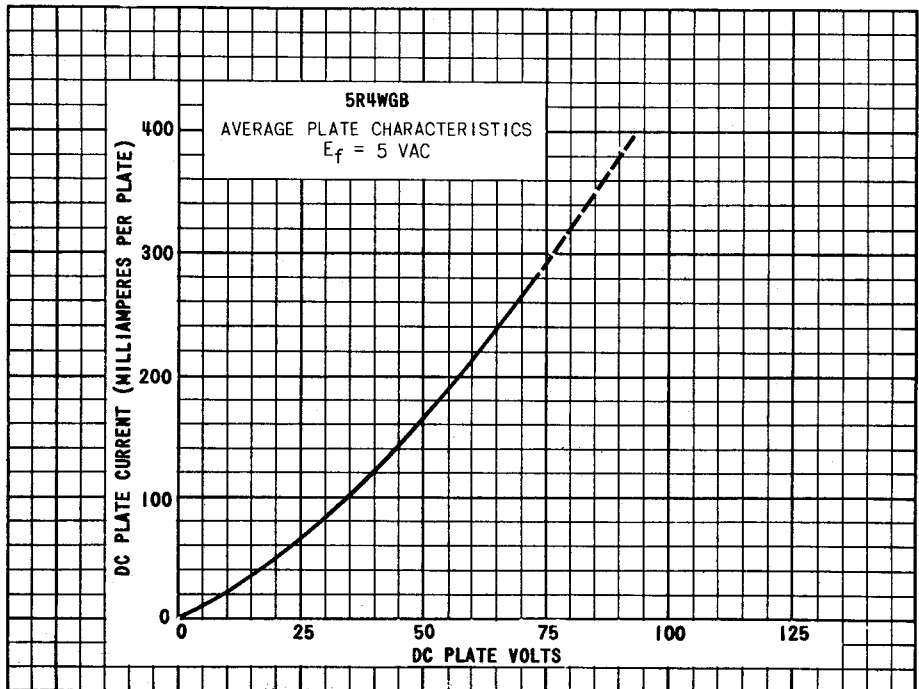
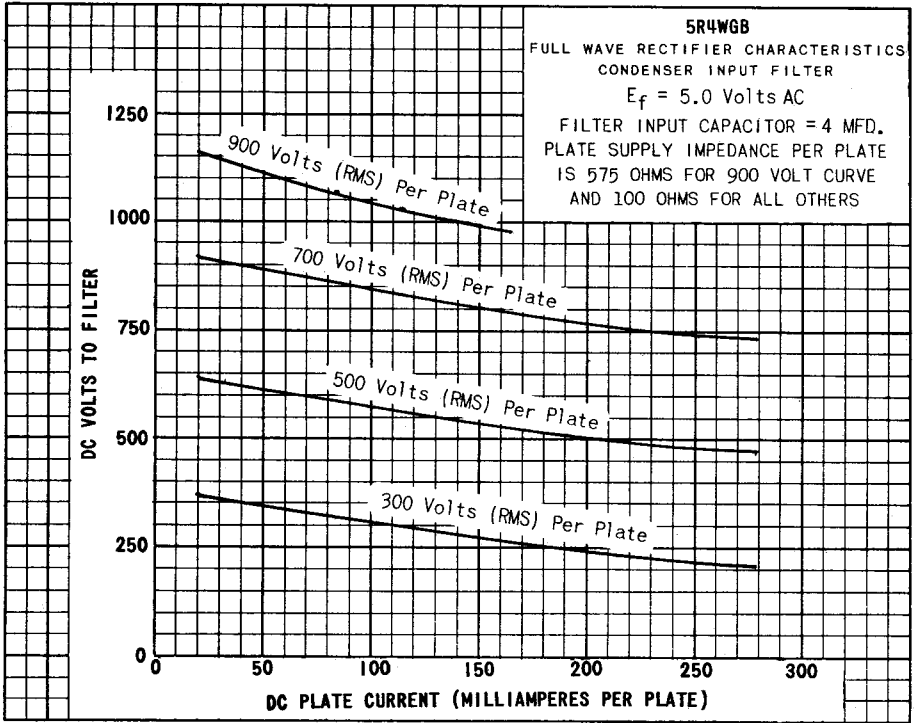
<sup>Ⓢ</sup> INDICATES MAXIMUM RATINGS; ALL OTHERS INDICATE APPROXIMATE VALUES.

ALL VALUES ARE FOR  $E_p = 5.0$  V. AND 10 SECONDS PREHEATING (NO PREHEATING IS NECESSARY FOR NO LOAD CONDITIONS). HIGHER VALUES OF FILTER CONDENSER CAPACITY MAY BE USED IF PLATE SUPPLY IMPEDANCE IS INCREASED TO KEEP PEAK PLATE CURRENT WITHIN RATINGS. FILTER VALUES ARE FOR 60 CYCLE OPERATION.

CONTINUED ON FOLLOWING PAGE



PRINTED ON U. S. A.



## TUNG-SOL

CONTINUED FROM PRECEDING PAGE

## ADDITIONAL TESTS TO INSURE RELIABILITY

ALL TUBES: OPERATION (1):  $e_{px} = 2800$  Vac; FULL WAVE;  $Z_{p/p} = 500$ ;  $C_L = 4$  mfd;  $R_L = 7000$  OHMS;  $t_k = 10$   $I_o > 140$  mAdc

OPERATION (2):  $E_{pp/p} = 850$  Vac, FULL WAVE;  $C_L = 4$  mfd;  $R_L = 3500$  OHMS,  $t_k = 10$ ;  $Z_{p/p}$  ADJUSTED FOR A BOGIE TUBE TO READ 260 mAdc, AND  $I_b$  NOT LESS THAN 630 mA PER PLATE.  
(A BOGIE TUBE IS A TUBE WITH A DROP OF 75Vdc AT 320 mAdc PER PLATE)  $I_o > 245$  mA.

STABILIZATION: 6 HOURS AT  $E_f = 5.0$  vac;  $E_{pp/p} = 800$  Vac;  $I_o = 300$  mAdc;  $R_L = 3000$ ;  $t_k = 0$  (CYCLED 15 MINUTES ON 5 MINUTES OFF)

RANDOM SAMPLE TESTED FOR THE FOLLOWING:

LOW PRESSURE VOLTAGE BREAKDOWN:

1).  $E_{pp/p} = 1050$  vac; FULL WAVE;  $R_L/I_o = 165$  mAdc;  $t_k = 10$  SEC;  $C_L = 4$  mfd,  $Z_{ptotal/p} = 500$   $\Omega$ ; PRESSURE 140 mm (40000 ft.)

2).  $e_{px} = 1850$  vac;  $R_L/I_o = 275$  mAdc;  $t_k = 10$  SEC;  $C_L = 4$  mfd;  $Z_{ptotal/p} = 200$   $\Omega$ ; FULL WAVE; PRESSURE = 55 mm (60000 ft.)

SHOCK:  $60^\circ$  HAMMER ANGLE IN NAVY FLYWEIGHT, HIGH IMPACT MACHINE (900G/mSEC).

FATIGUE: 25 CPS, 0.80" TOTAL DISPLACEMENT, FOR 32 HOURS IN EACH OF THESE MUTUALLY PERPENDICULAR PLANES (2.5 G).

POST SHOCK AND FATIGUE TEST END POINT:  
OPERATION (2)  $I_o > 240$  mAdc.

LIFE TEST:

FILAMENT CYCLING: 2000 CYCLES;  $E_f = 5.5$  Vac; 1 MINUTE ON, 1 MINUTE OFF PER CYCLE. (FILAMENT VOLTAGE REGULATION 3% NO LOAD TO FULL LOAD).

INTERMITTENT LIFE TEST

OPERATION (2) 100 HOURS	$I_o > 245$ mAdc.
OPERATION (2) 500 HOURS	$I_o > 240$ mAdc.
OPERATION (2) 1000 HOURS	$I_o > 240$ mAdc.