

BRIMAR

RECEIVING VALVE

35 W 4

APPLICATION REPORT VAD/501.6

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Standard Telephones and Cables Limited

FOOTSCRAY, KENT, ENGLAND

INTRODUCTION: The Brimar type 35W4 is a miniature indirectly heated half wave rectifier having a 150 mA Heater intended for use in series with other valves having a similar heater current, such as in AC/DC equipment. Provision of a heater tap enables a dial lamp to be operated across a portion of the heater.

DESCRIPTION: The valve consists of a half wave rectifier unit having an indirectly heated cathode, the cathode being insulated from the heater. The unit is mounted in a standard T5½ bulb and is based with a B7G B.V.A. Standard base.

CHARACTERISTICS:

Cathode:	<i>Without Dial Lamp</i>	<i>With Dial Lamp</i>
Indirectly Heated Voltage (nominal) Pins 3 and 4	35	32 volts
Voltage (nominal) Lamp Section Pins 4 and 6	7.5	5.5 volts
Current	0.15	0.15 ampere*
Max. DC Heater-Cathode potential	330	330 volts

* The heater current should not vary more than 5% from the rated value at any time, particularly is this important if the valve is used near its maximum ratings.

Dimensions:	Max. Overall Length	2-5/8 Ins.
	Max. Diameter	3/4 in.
	Max. Seated Height	2-3/8 Ins.

Base: B.V.A. Standard Base Type B7G

Basing Connections:	Pin 1 No Connection
	Pin 2 No Connection
	Pin 3 Heater
	Pin 4 Heater
	Pin 5 Anode
	Pin 6 Heater Tap
	Pin 7 Cathode

Dial lamp heater section between pins 4 and 6.

Ratings:

Half-Wave Rectifier:

Max. Peak Inverse Voltage	700 volts
Max. Peak Anode Current	600 mA

With Condenser Input Filter:

Max. AC Anode Voltage (R.M.S.)	250 volts*
Min. Effective Limiting Resistance	120 ohms
Max. Reservoir Condenser	32 mfd.
Max. DC Output Current without Dial Lamp	100 mA
With Dial Lamp only	60 mA
With Dial Lamp and Resistor	90 mA

* Ratings above 117 volts R.M.S. input may not be applicable to 35W4's of other manufacturers.

CHARACTERISTIC CURVES: Curves taken with no dial lamp are attached to this report which show:

Anode current plotted against anode voltage I_a/V_a (Curve No. 301-42).

DC output voltage plotted against DC load current for an AC R.M.S. input of 117 volts and various values of reservoir condenser (Curve No. 301-34).

DC output voltage plotted against DC load current for an input of 250 volts R.M.S. for various values of reservoir condenser (Curve No. 301-43).

DC output voltage plotted against DC load current for various R.M.S. input voltages and a reservoir condenser of 32 mfd (Curve No. 301-44).

TYPICAL OPERATION

Half-Wave Rectifier (without dial lamp):

Heater Current	0.15	0.15	0.15	ampere
AC Anode Voltage R.M.S.	250	117		volts
Limiting Resistance*	100	15		ohms
Reservoir Condenser	16	16		mfd
Output Current (DC)	75	100	75	100 mA
Output Voltage (DC)	245	225	115	103 volts

Half-Wave Rectifier (with dial lamp):

Heater current	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	amperes
AC Anode Voltage R.M.S.	117	117	117	117	250	250	250	250	250	volts
Limiting Resistor*	15	15	15	15	100	100	100	100	100	Ω
Panel Lamp Shunting Resistor	—	300	150	100	—	300	150	100	100	Ω
DC Output Current	60	70	80	90	60	70	80	90		

* The value of the limiting resistances shown above are minimum values; these resistances are necessary in order to limit the peak anode current of the figure given on page 2. They may be omitted in the form of an actual resistance where at least the value given is included in the mains dropping resistance or line cord between the anode and the live mains connection. In the case of 250 volts operation the resistance should be of the 1 watt type and preferably be of a type that will not catch fire when over run in the event of a short circuit in the HT supply of the equipment: a vitreous wire wound type is recommended.

Recommendations for Operation with Dial Lamp: The valve is designed for use with a dial lamp rated at 6.3 volts 0.15 ampere and if the rectified DC load exceeds 60 mA an additional shunting resistor across the lamp and pins 4 and 6 is essential with values as follows:

70 mA	800 ohms max.
80 mA	400 ohms max.
90 mA	250 ohms max.

A typical circuit (Ref. VAD/301-51) showing the connections for a dial lamp and shunting resistor is attached to this report.

WARNING. Where the supply of the correct rating lamp cannot be ensured for replacement purposes and there is any danger that the lamp may be replaced with one of different current rating, the valve should not be operated at DC output ratings above 60 mA, with the circuit shown, or there will be a danger of the section of the heater, between pins 4 and 6, being either under or over run.

It is, therefore, recommended that in general the valve should be employed in a conventional manner, the dial lamp being in series with the other heaters and protected with suitable Brimistors, rather than reliance being placed on the supply of suitable lamps.

BRIMAR 35W4

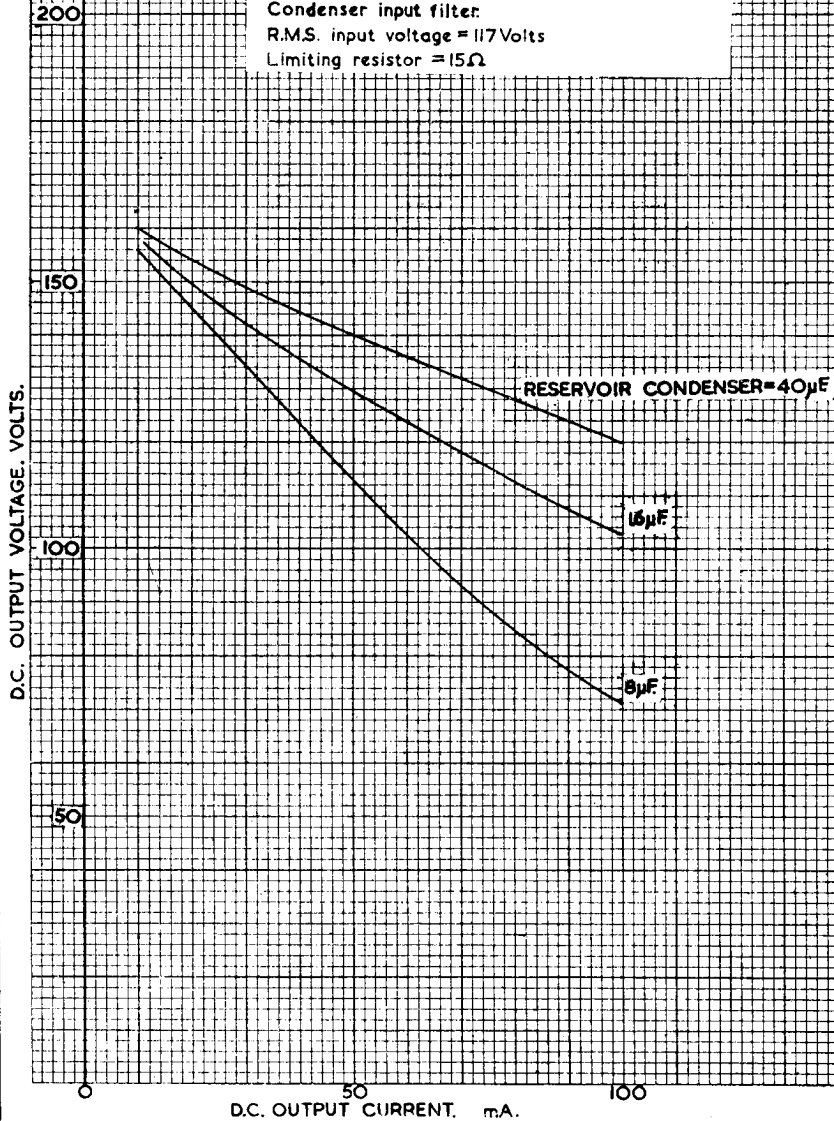
OUTPUT VOLTAGE versus OUTPUT CURRENT.

Heater voltage = 35Volts between pins 3 & 4.

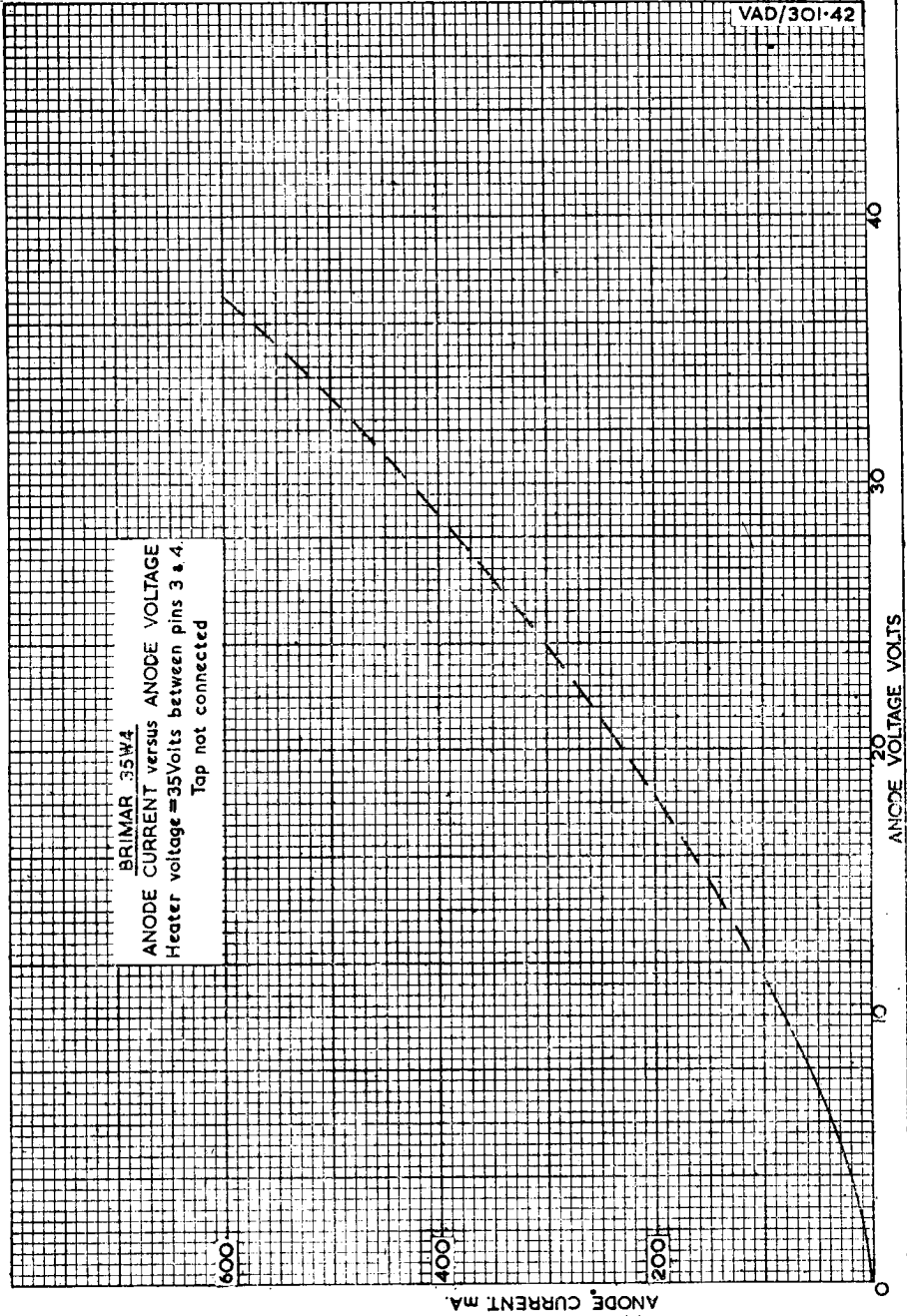
Tap not connected.

Condenser input filter:

R.M.S. input voltage = 117 Volts

Limiting resistor = 15 Ω 

BRIMAR 35W4
ANODE CURRENT versus ANODE VOLTAGE
Heater voltage = 35Volts between pins 3 & 4.
Tap not connected

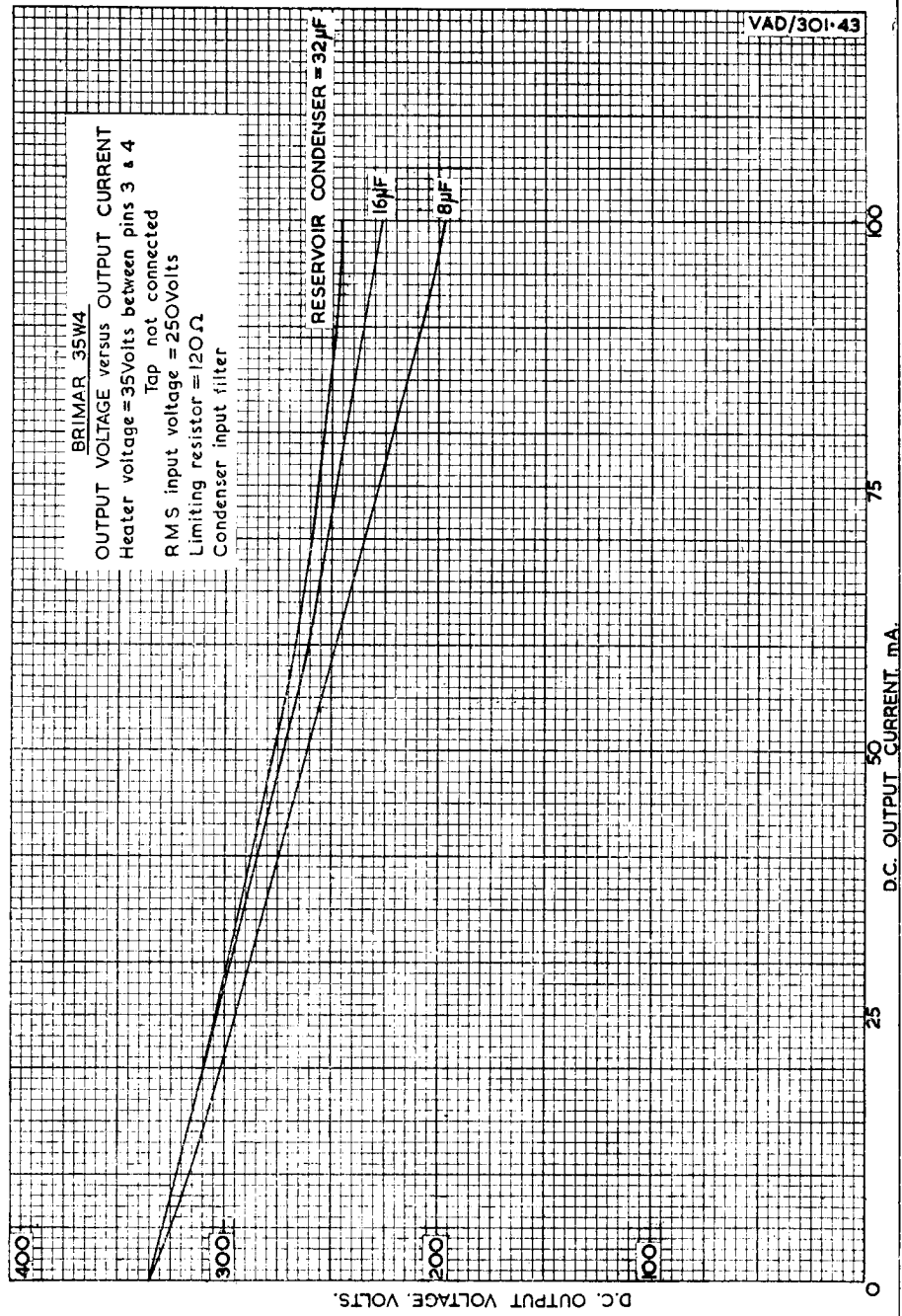


ANODE CURRENT, MA

ANODE VOLTAGE VOLTS

BRIMAR 35W4
OUTPUT VOLTAGE versus OUTPUT CURRENT
Heater voltage = 35Volts between pins 3 & 4
Tap not connected
RMS input voltage = 250Volts
Limiting resistor = 120Ω
Condenser input filter

RESERVOIR CONDENSER = 32μF

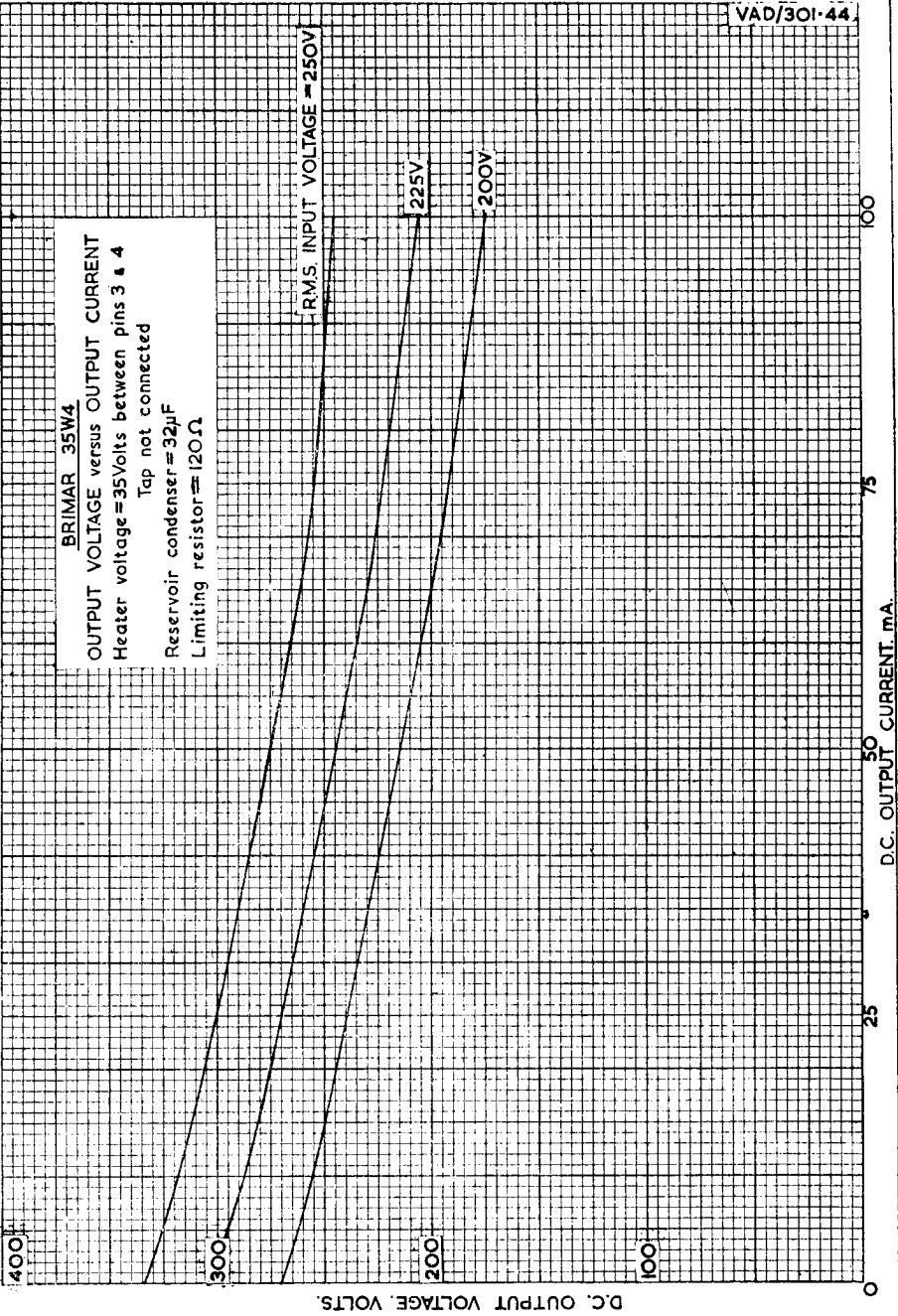


D.C. OUTPUT VOLTAGE, VOLTS.

D.C. OUTPUT CURRENT, mA.

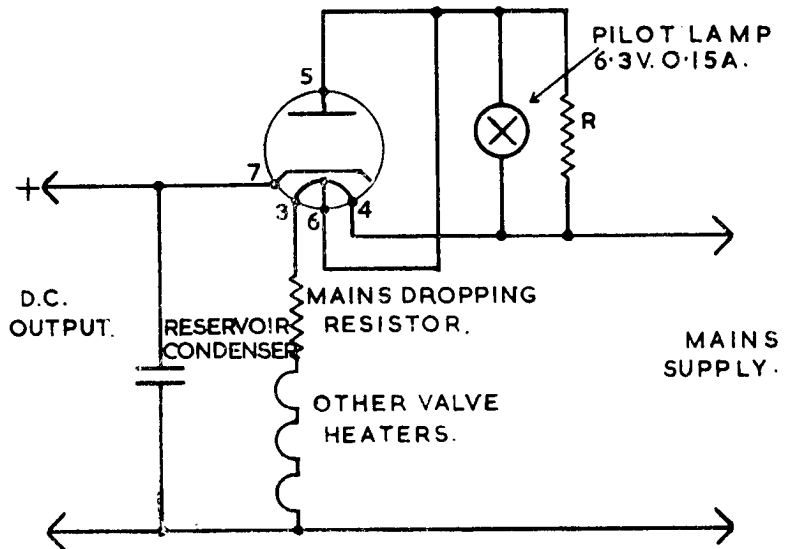
BRIMAR 35W4
 OUTPUT VOLTAGE versus OUTPUT CURRENT
 Heater voltage = 35 Volts between pins 3 & 4
 Tap not connected
 Reservoir condenser = 32 μ F
 Limiting resistor = 120 Ω

RMS INPUT VOLTAGE = 250V



DC. OUTPUT VOLTAGE VOLTS.

D.C. OUTPUT CURRENT, mA.

BRIMAR 35W4**CIRCUIT FOR UTILISING PILOT LAMP TAP**

OUTPUT CURRENT mA.	PILOT LAMP SHUNT(R) OHMS *
60 & BELOW	NOT REQUIRED.
70	800
80	400
90	250

* SEE ALSO PAGE 3