



AC5/Pen and AC5/Pen.DD BEAM POWER AMPLIFIERS FOR A.C. MAINS

| RATING. | <i>AC5/Pen</i> | <i>AC5/Pen.DD</i> |
|-----------------------------------|----------------|-------------------|
| Heater Voltage | 4.0 | 4.0 |
| Heater Current (amps.) | 1.75 | 2.0 |
| Maximum Anode Voltage | 250 | 250 |
| Maximum Screen Voltage | 250 | 250 |
| *Mutual Conductance (mA/V) | 9.0 | 9.0 |

*at $E_a = 100$; $E_s = 100$; $E_g = 0$.

OPERATING CONDITIONS (Both Types).

| | |
|--|------------------|
| Anode Voltage | 250 |
| Screen Voltage | 250 |
| Grid Bias | 8.5 |
| Quiescent Anode Current (mA) | 40 |
| Quiescent Screen Current (mA) | 7.5 |
| Self-bias Resistance (ohms) | 175 |
| Power Output (watts) | 4.85* 5.80† |
| Anode Load (ohms) | 5,200* 4,500† |
| Input Swing (Volts r.m.s.) | 4.0* 5.0† |
| Anode Current with input swing (mA) | 41.5* 42.5† |
| Input swing for 50 mW. output (r.m.s.) | .36 .38 |
| Input swing for 250 mW. output (r.m.s.) | .81 .85 |

* For 5% 3rd harmonic and 2nd harmonic not exceeding 5%.

† For 7% 3rd harmonic and 2nd harmonic not exceeding 7%.

INTER-ELECTRODE CAPACITIES.

| | <i>AC5/Pen.DD</i> |
|---------------------------|-----------------------|
| *Anode to Earth | 9.75 $\mu\mu\text{F}$ |
| *Grid 1 to Earth | 18.5 $\mu\mu\text{F}$ |
| Anode to Grid 1 | 0.9 $\mu\mu\text{F}$ |
| *Diode 1 to Earth | 4.25 $\mu\mu\text{F}$ |
| *Diode 2 to Earth | 4.0 $\mu\mu\text{F}$ |
| Diode 1 to Diode 2 | 0.15 $\mu\mu\text{F}$ |

* "Earth" denotes the electrodes of any second valve section and the remaining earthy potential electrodes of the section under measurement, H and M joined to cathode.

DIMENSIONS.

| | <i>AC5/Pen.</i> | <i>AC5/Pen.DD</i> |
|------------------------------|-----------------|-------------------|
| Maximum overall length... .. | 129 | 142 mm. |
| Maximum diameter | 54 | 54 mm. |

GENERAL.

The AC5/Pen. and AC5/Pen.DD are indirectly heated beam power amplifying valves for operation with screen and anode voltages of 250 in the output stage of A.C. mains receivers.

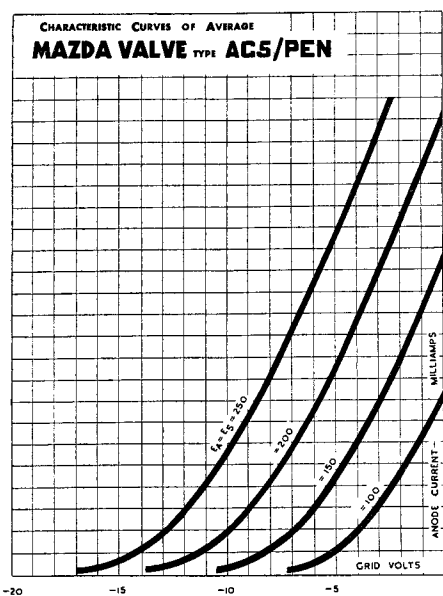


The AC5/Pen.DD is similar to the AC5/Pen, but has two additional diode anodes operated from a common cathode. The diode section is completely screened within the valve from the tetrode section.

The AC5/Pen has a similar sensitivity to that of the AC2/Pen up to the maximum power output available from the latter. By increasing the input swing the power output can be increased to the order of 5 watts without exceeding 5 per cent. of any individual harmonic. The absence of the suppressor grid enables a very low "knee" voltage to be obtained on the anode current—anode volts curve which gives increased power output with decreased distortion.

AC5/PEN OPERATION.

It is recommended that the grid bias should be obtained from a self-bias resistance and the grid-cathode circuit resistance should not exceed one megohm.



Anti-parasitic resistances should be included in the grid and/or anode circuits, suggested values being 5,000 and 50 ohms respectively.

The required transformer ratio for connecting the valve to the speaker can be calculated by multiplying the D.C. resistance of the speech coil by 1.1 and dividing this figure into the optimum load. The correct ratio is then the square root of the result.

The anode load must be prevented from rising with frequency by means of a suitable filter across the output transformer. Suggested values are .02 μ F and

5,000 ohms, but these are governed by the attenuation in the earlier stages of the receiver and the characteristics of the speaker.

AC5/PEN.DD OPERATION.

In normal operation one diode anode (Pin No. 1) is employed as an audio-frequency detector and the other (Pin No. 3) to provide A.V.C. voltage.



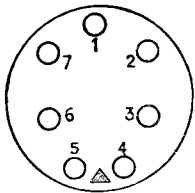
The load resistance of the detector diode should be returned to the cathode and the load resistance of the A.V.C. diode should be returned to a point at negative potential to provide the necessary delay voltage. A delay voltage of over 8 may be obtained from the drop across the self-bias resistance.

It is recommended that a delay voltage of 15-20 be used, which can be obtained from an extra resistance inserted in the self-bias circuit.

The operating conditions of the AC5/Pen.DD tetrode portion are similar to those of the AC5/Pen and the same precautions regarding parasitic oscillation should be taken. The grid-cathode resistance should not exceed one megohm.

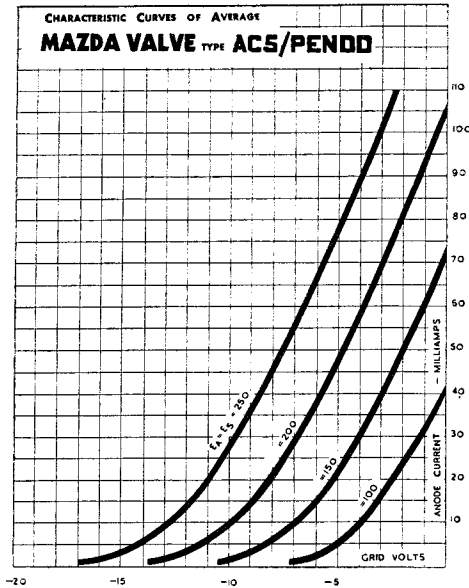
Note.—Owing to the high power handling capacity of these valves the bulbs are very hot in service and adequate ventilation should be provided.

BASE CONNECTIONS.



| | AC5/Pen. | AC5/Pen.DD. |
|------------|--------------|--------------|
| Pin No. 1. | Blank | Diode No. 1 |
| Pin No. 2. | Control Grid | Anode |
| Pin No. 3. | Screen Grid | Diode No. 2 |
| Pin No. 4. | Heater | Heater |
| Pin No. 5. | Heater | Heater |
| Pin No. 6. | Cathode | Cathode |
| Pin No. 7. | Anode | Screen Grid |
| Top Cap. | — | Control Grid |

Viewed from end of pins.





*Mazda Radio Valves are manufactured in Great Britain for
the British Thomson-Houston Co. Ltd., London and Rugby.*

=====**EDISWAN RADIO**=====