

## S.Q. TUBE

Special quality tube designed for use as wide band amplifier, cathode follower, series regulator tube for stabilised d.c. supply and output tube.

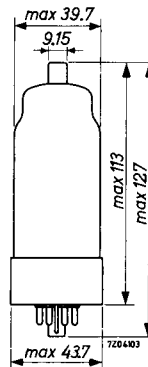
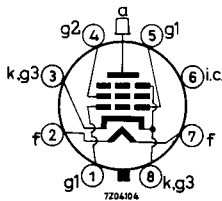
### QUICK REFERENCE DATA

|                        |   |           |
|------------------------|---|-----------|
| Life test              | 10 000 hours                              |           |
| Mechanical quality     | Shock and vibration resistant             |           |
| Base                   | Octal                                     |           |
| Heating                | Indirect<br>A.C. or D.C.; parallel supply |           |
| Heater voltage         | $V_f$                                     | 6.3 V     |
| Heater current         | $I_f$                                     | 1.7 A     |
| Anode current          | $I_a$                                     | 100 mA    |
| Mutual conductance     | S   | 27.5 mA/V |
| Output power, one tube | $W_o$                                     | 11.5 W    |
| two tubes, class AB    | $W_o$                                     | 60 W      |

### DIMENSIONS AND CONNECTIONS

Dimensions in mm

Base: Octal



**CHARACTERISTICS**

Column I Nominal value or setting of the tube

II Range values for equipment design: Initial spread

III Range values for equipment design: End of life

|                                   |              | I    | II          | III                 |            |
|-----------------------------------|--------------|------|-------------|---------------------|------------|
| Heater voltage                    | $V_f$        | 6.3  |             |                     | V          |
| Heater current                    | $I_f$        | 1.7  | 1.62 - 1.78 |                     | A          |
| Anode voltage                     | $V_a$        | 250  |             |                     | V          |
| Grid No.2 voltage                 | $V_{g2}$     | 150  |             |                     | V          |
| Grid No.1 voltage                 | $-V_{g1}$    | 15.5 |             |                     | V          |
| Anode current                     | $I_a$        | 100  |             |                     | mA         |
| Grid No.2 current                 | $I_{g2}$     | 4    |             |                     | mA         |
| Mutual conductance                | S            | 27.5 |             |                     | mA/V       |
| Amplification factor              | $\mu_{g2g1}$ | 6.5  |             |                     |            |
| Internal resistance               | $R_i$        | 10   |             |                     | k $\Omega$ |
| Anode supply voltage              | $V_{ba}$     | 275  |             |                     | V          |
| Grid No.2 supply voltage          | $V_{bg2}$    | 180  |             |                     | V          |
| Positive grid No.1 supply voltage | $V_{bg1}$    | 15.7 |             |                     | V          |
| Cathode resistor                  | $R_k$        | 300  |             |                     | $\Omega$   |
| Anode current                     | $I_a$        | 100  | 85 - 115    | decrease<br>max.40% | mA         |
| Grid No.2 current                 | $I_{g2}$     | 4    | max. 6      |                     | mA         |
| Mutual conductance                | S            | 27.5 | 22.5 - 32.5 | decrease<br>max.30% | mA/V       |
| Negative grid No.1 current        | $-I_{g1}$    |      | max. 0.5    | max. 1              | $\mu$ A    |
| <u>Cut off voltage</u>            |              |      |             |                     |            |
| Anode voltage                     | $V_a$        | 250  |             |                     | V          |
| Grid No.2 voltage                 | $V_{g2}$     | 150  |             |                     | V          |
| Anode current                     | $I_a$        | 1    |             |                     | mA         |
| Negative grid No.1 voltage        | $-V_{g1}$    |      | max. 30     |                     | V          |

## CHARACTERISTICS (continued)

|   | II       | III     |            |
|---|----------|---------|------------|
| Insulation resistance<br>between one electrode and all<br>other electrodes measured<br>with V = 400 V |          |         |            |
| $R_{isol}$  | min. 100 | min. 20 | M $\Omega$ |

## CAPACITANCES Without external shield

|  | I  | II     |    |
|--|----|--------|----|
| Grid No.1 to grid No.3, grid No.2,<br>cathode and heater |    |        |    |
| $C_{g_1/g_3g_2kf}$                                       | 35 |        | pF |
| Anode to grid No.3, grid No.2,<br>cathode and heater     |    |        |    |
| $C_a/g_3g_2kf$   | 17 |        | pF |
| Anode to grid No.1                                       |    |        |    |
| $C_{ag_1}$   |    | max. 2 | pF |

## SHOCK AND VIBRATION RESISTANCE

The following test conditions are applied to assess the mechanical quality of the tube. These conditions are not intended to be used as normal operating conditions.

Shock

The tube is subjected 5 times in each of 4 positions to an acceleration of 500 g supplied by an NRL shock machine with the hammer lifted over an angle of 30°.

Vibration

The tube is subjected during 32 hours in each of 3 positions to a vibration frequency of 50 Hz with an acceleration of 2.5 g.

## LIFE

Production samples are tested to be within the end of life values (column III) under the following conditions during 10 000 hours.

|  |                  |               |
|--|------------------|---------------|
| Anode supply voltage                                   | $V_{ba}$         | 275 V         |
| Grid No.2 supply voltage                               | $V_{bg_2}$       | 180 V         |
| Grid No.1 supply voltage                               | $+V_{bg_1}$      | 15.7 V        |
| Cathode resistor                                       | $R_k$            | 300 $\Omega$  |
| Grid No.1 resistor                                     | $R_{g_1}$        | 47 k $\Omega$ |
| Voltage between cathode and heater<br>cathode positive | $V_{kf}$ (k pos) | 100 V         |



**LIMITING VALUES** (continued)

Heater voltage: The average heater voltage should be 6.3 V.

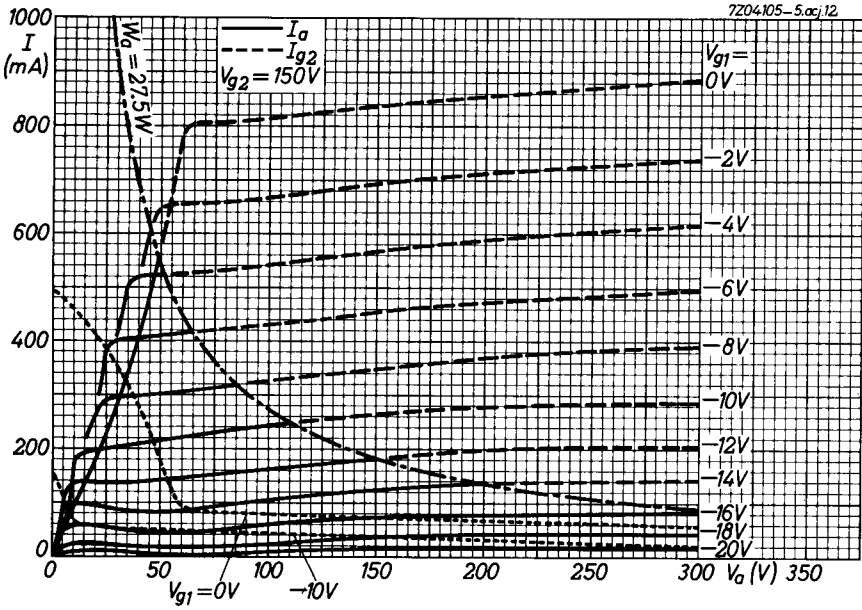
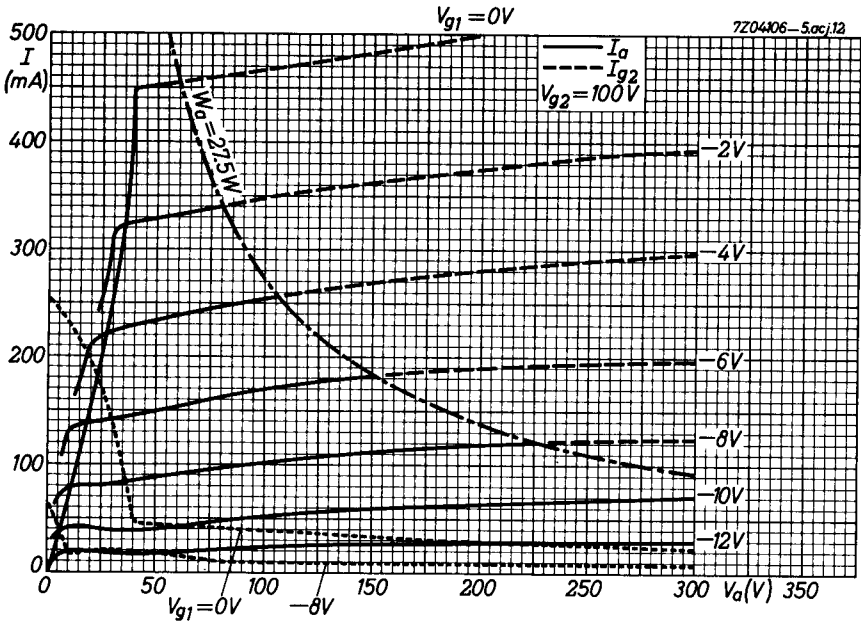
Variations of the heater voltage exceeding the range of 6.0 V to 6.6 V will shorten the tube life. The tolerance of the heater current (column II) should be taken into account.

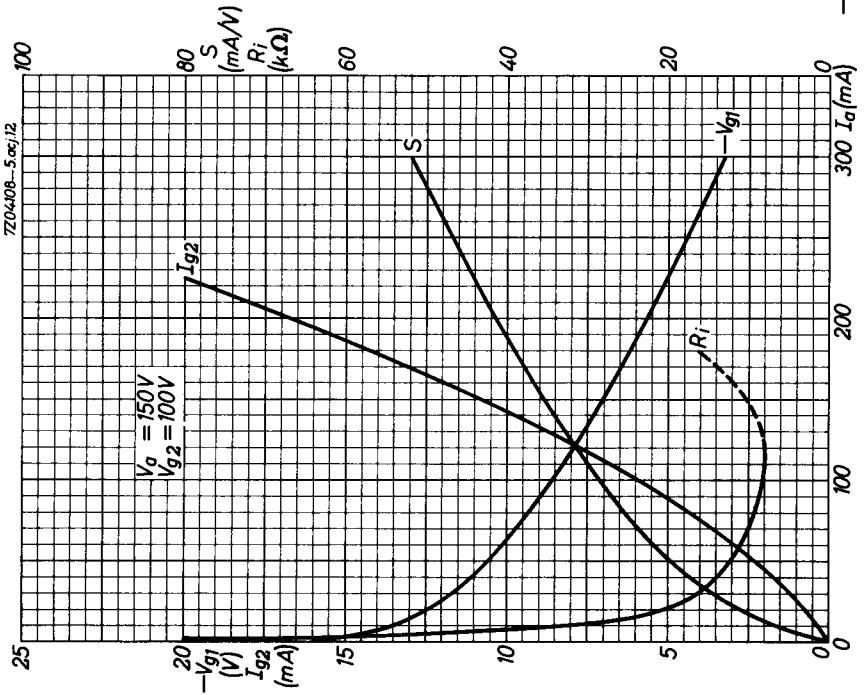
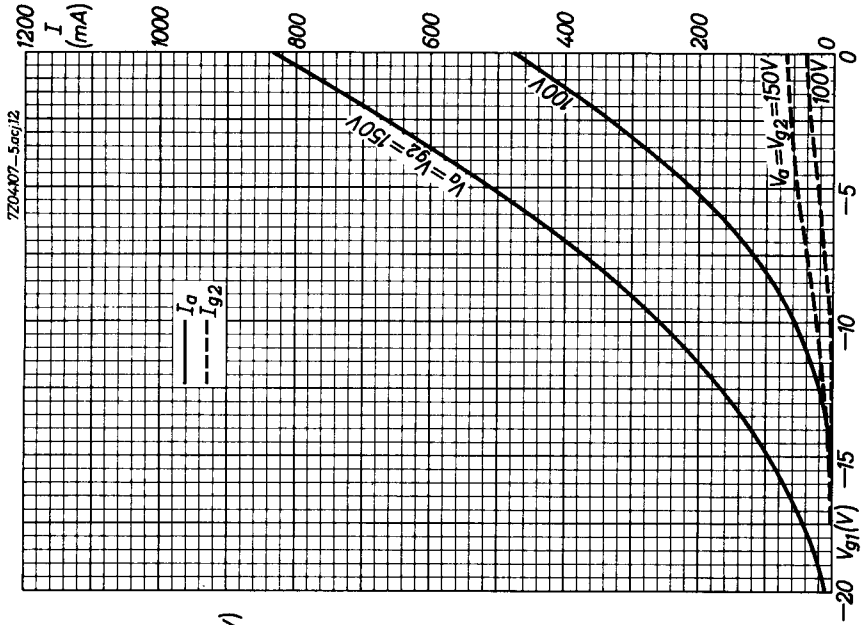
**OPERATING CHARACTERISTICS**Output tube class A

|                   |             |      |            |
|-------------------|-------------|------|------------|
| Anode voltage     | $V_a$       | 250  | V          |
| Grid No.2 voltage | $V_{g2}$    | 150  | V          |
| Grid No.1 voltage | $-V_{g1}$   | 15.5 | V          |
| Load resistance   | $R_{a\sim}$ | 2.7  | k $\Omega$ |
| Input voltage     | $V_i$       | 3.82 | $V_{RMS}$  |
| Anode current     | $I_a$       | 100  | mA         |
| Grid No.2 current | $I_{g2}$    | 18   | mA         |
| Output power      | $W_o$       | 11.5 | W          |
| Total distortion  | $d_{tot}$   | 10   | %          |

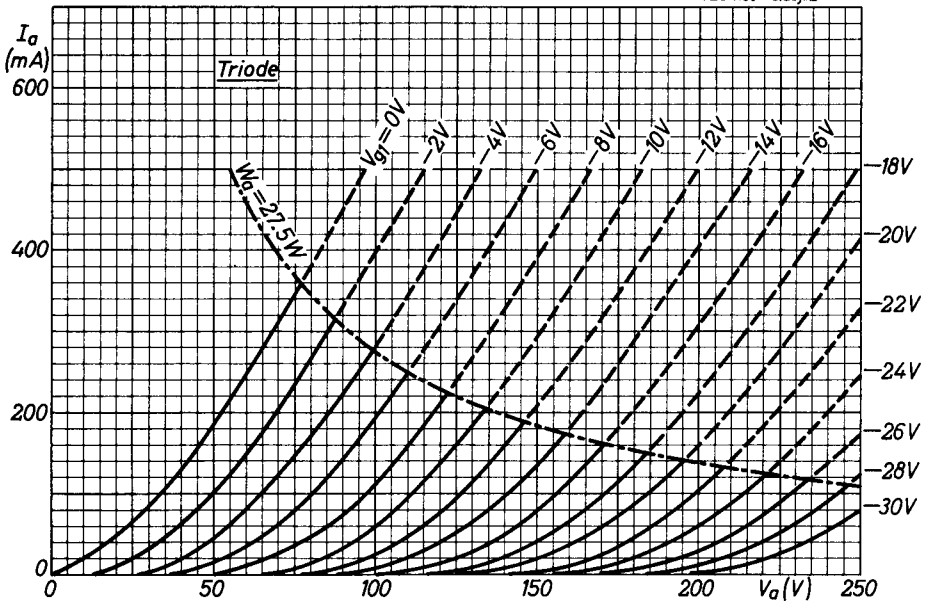
Output tube class AB (2 tubes)

|                   |              |              |            |
|-------------------|--------------|--------------|------------|
| Anode voltage     | $V_a$        | 300          | V          |
| Grid No.2 voltage | $V_{g2}$     | 150          | V          |
| Grid No.1 voltage | $-V_{g1}$    | 17           | V          |
| Load resistance   | $R_{aa\sim}$ | 1.6          | k $\Omega$ |
| Input voltage     | $V_i$        | 0 0.24 9.0   | $V_{RMS}$  |
| Anode current     | $I_a$        | 2x80 - 2x182 | mA         |
| Grid No.2 current | $I_{g2}$     | 2x2.5 - 2x22 | mA         |
| Output power      | $W_o$        | 0 0.05 60    | W          |
| Total distortion  | $d_{tot}$    | - - 5        | %          |





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# PHILIPS

Data handbook



Electronic  
components  
and materials

## E130L

| <b>page</b> | <b>sheet</b> | <b>date</b> |
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| 1           | 1            | 1968.12     |
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| 6           | 6            | 1968.12     |
| 7           | 7            | 1968.12     |
| 8           | 8            | 1968.12     |
| 9           | FP           | 2000.12.03  |