

## S.Q. TUBE

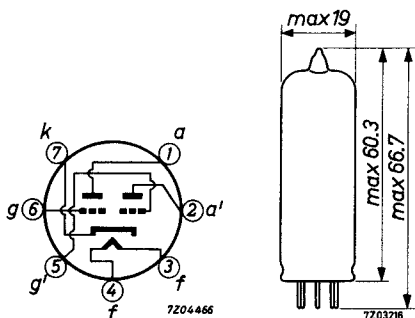
Special quality double triode designed for use in computer circuits.

### QUICK REFERENCE DATA

|                          |   |        |
|--------------------------|---|--------|
| Life expectancy          | 10 000 hours  |        |
| Low interface resistance |   |        |
| Base                     | Miniature, 7 pin                                      |        |
| Heating                  | Direct<br>A. C. or D. C.<br>Series or parallel supply |        |
| Heater voltage           | $V_f$   | 6.3 V  |
| Heater current           | $I_f$   | 400 mA |

### DIMENSIONS AND CONNECTIONS

Dimensions in mm



## 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

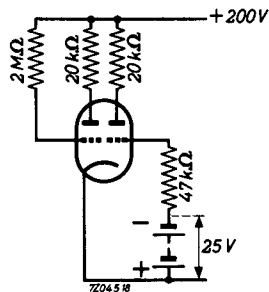
|   |                | I   | II         | III      |            |
|---|----------------|-----|------------|----------|------------|
| Heater voltage  | $V_f$          | 6.3 |            |          | V          |
| Heater current  | $I_f$          | 400 | 380 - 420  |          | mA         |
| Anode voltage   | $V_a$          | 100 |            |          | V          |
| Negative grid voltage                                 | $-V_g$         | 2.1 |            |          | V          |
| Anode current   | $I_a$          | 8.5 | 4.5 - 12.5 |          | mA         |
| Mutual conductance                                    | S              | 6.0 |            |          | mA/V       |
| Amplification factor                                  | $\mu$          | 27  |            |          |            |
| Anode voltage   | $V_a$          | 100 |            |          | V          |
| Cathode resistor                                      | $R_k$          | 250 |            |          | $\Omega$   |
| Mutual conductance                                    | S              | 6.0 | 4.5 - 7.5  | min. 3.0 | mA/V       |
| <u>Negative grid current</u>                          | $-I_{g1}$      |     | max. 0.2   | max. 1.0 | $\mu$ A    |
| Anode supply voltage                                  | $V_{ba}$       | 150 |            |          | V          |
| Anode resistor  | $R_a$          | 20  |            |          | k $\Omega$ |
| Grid resistor   | $R_g$          | 47  |            |          | k $\Omega$ |
| Anode current   | $I_a$          | 5.6 | 5.0 - 6.2  | min. 4.5 | mA         |
| Grid supply voltage                                   | $V_{bg}$       | 0   |            |          | V          |
| Anode current   | $I_a$          |     | max. 0.1   | max. 0.1 | mA         |
| Grid supply voltage                                   | $-V_{bg}$      | 10  |            |          | V          |
| Difference in grid voltage<br>of two sections         | $ V_g - V_g' $ |     | max. 2     | max. 2   | V          |
| Anode current   | $I_a = I_a'$   | 0.1 |            |          | V          |
| <u>Leakage current<br/>between cathode and heater</u> | $I_{kf}$       |     | max. 15    | max. 30  | $\mu$ A    |
| Voltage between cathode and<br>heater                 | $V_{kf}$       | 100 |            |          | V          |
| <u>Insulation between two electrodes</u>              | $R_{ins}$      |     | min. 100   | min. 20  | M $\Omega$ |
| Voltage between electrodes                            | V              | 300 |            |          | V          |

## CAPACITANCES Each system if applicable.

|                              |                 | I    | II          |    |
|------------------------------|-----------------|------|-------------|----|
| Anode to cathode and heater  | $C_{a/kf}$      | 0.35 | 0.25 - 0.45 | pF |
|                              | $C_{a' / k' f}$ | 0.4  | 0.3 - 0.5   | pF |
| Grid to cathode and heater   | $C_{g/kf}$      | 3.4  | 2.9 - 3.9   | pF |
|                              | $C_{ag}$        | 2.5  | 2.0 - 3.0   | pF |
| Grid to heater               | $C_{gf}$        |      | max. 0.15   | pF |
|                              | $C_{g'f}$       |      | max. 0.3    | pF |
| Anode to anode other section | $C_{aa'}$       |      | max. 1.4    | pF |
| Grid to grid other section   | $C_{gg'}$       |      | max. 0.22   | pF |
| Anode to grid other section  | $C_{ag'}$       |      | max. 0.35   | pF |
| Grid to anode other section  | $C_{ga'}$       |      | max. 0.15   | pF |
| Cathode to heater            | $C_{kf}$        | 6.5  |             | pF |

## LIFE

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



$$I_a = 8 \text{ mA}$$

$$I_{a'} = 0 \text{ mA}$$

$$V_{kf} = 100 \text{ V (k pos)}$$

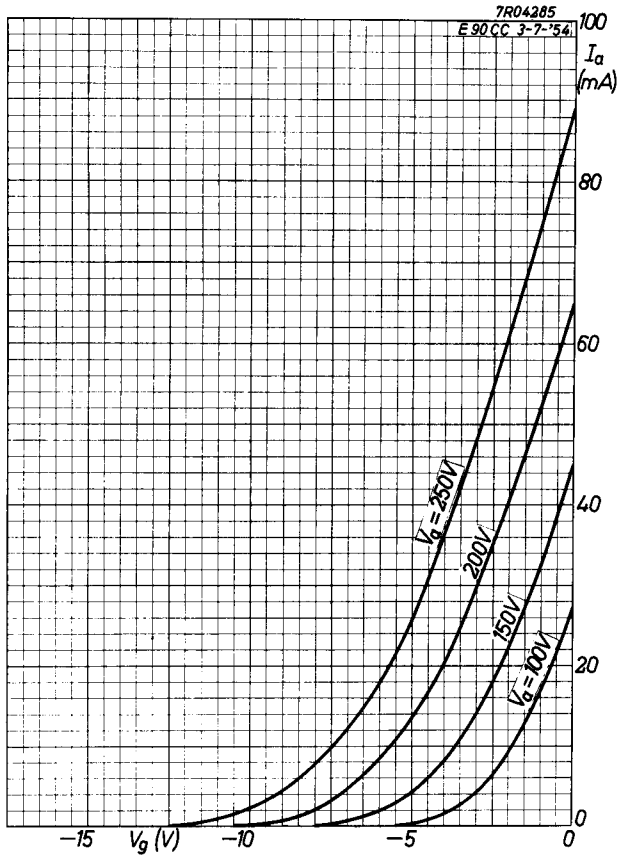
**LIMITING VALUES** (Absolute max. rating system)

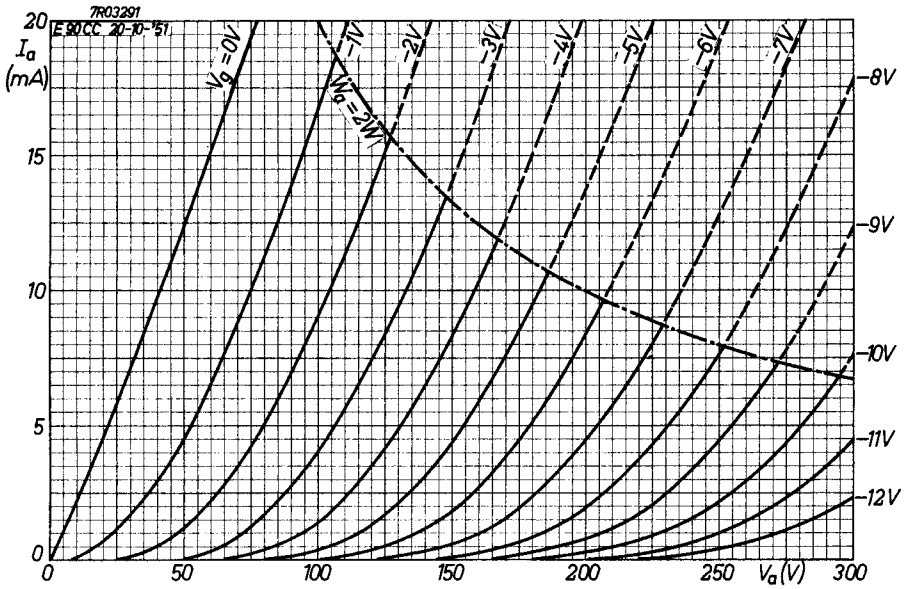
|  |  |       |                    |
|--|--|-------|--------------------|
| Anode voltage                                      | $V_{a0}$   | max.  | 600 V              |
|  | $V_a$  | max.  | 300 V              |
| Anode dissipation                                  | $W_a$  | max.  | 2.0 W              |
|  | $+V_g$   | max.  | 0 V                |
| Grid voltage                                       | $-V_g$   | max.  | 100 V              |
|  | $-V_{gp}$  | max.  | 200 V              |
| Grid peak voltage                                  | $I_g$  | max.  | 250 $\mu$ A        |
| Grid current                                       | $I_{gp}$   | max.  | 1 mA               |
|  | Grid, peak current<br>max. pulse duration 2.5 msec |       |                    |
| Cathode current                                    | $I_k$  | max.  | 15 mA              |
| Cathode peak current<br>max. pulse duration 2 msec | $I_{kp}$   | max.  | 75 mA              |
|  |  |       |                    |
| Voltage between cathode and heater                 | $V_{kf}$   | max.  | 100 V              |
| Grid resistor, automatic bias                      | $R_g$  | max.  | 1 $M\Omega$        |
|  | fixed bias   | $R_g$ | max. 0.5 $M\Omega$ |
| Bulb temperature                                   | $t_{bulb}$   | max.  | 170 $^{\circ}$ C   |

Heater voltage: The average heater 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 heater current (column II) should be taken into account.





# PHILIPS

Data handbook



Electronic  
components  
and materials

## E90CC

| <b>page</b> | <b>sheet</b> | <b>date</b> |
|-------------|--------------|-------------|
| 1           | 1            | 1968.12     |
| 2           | 2            | 1968.12     |
| 3           | 3            | 1968.12     |
| 4           | 4            | 1968.12     |
| 5           | 5            | 1968.12     |
| 6           | 6            | 1968.12     |
| 7           | FP           | 2000.11.24  |