

ELECTRONIC TUBE REFERENCE

PL84

Power - TV Vertical Output electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION  
CONSTRUCTION  
PENTODE

Series-heater power pentode for both audio output and television vertical/frame-deflection service.

GENERAL CHARACTERISTICS

|                     |                   |                      |               |
|---------------------|-------------------|----------------------|---------------|
| BASE DESIGNATION    | 9CV               | BASE PINS            | 9             |
| NOMINAL HEATER      | 15 V / 285 mA     | PARALLEL HEATER      | – / –         |
| HEATING             | Indirect          | SERIES OPERATION     | Not specified |
| CATHODE ARRANGEMENT | Separate cathodes | SECTION CONSTRUCTION | Similar       |

9CV - TERMINAL PINOUT

| TERMINAL  | SECTION | ELEMENT              | STATUS    |
|-----------|---------|----------------------|-----------|
| PIN1 – IC | –       | –                    | IC        |
| PIN2 – G1 | A       | G1 – Control Grid    | CONNECTED |
| PIN3 – G3 | A       | G3 – Suppressor Grid | CONNECTED |
| PIN3 – K  | A       | K – Cathode          | CONNECTED |
| PIN4 – H  | –       | H – Heater           | CONNECTED |
| PIN5 – H  | –       | H – Heater           | CONNECTED |
| PIN6 – IC | –       | –                    | IC        |
| PIN7 – P  | A       | P – Plate (Anode)    | CONNECTED |
| PIN8 – IC | –       | –                    | IC        |
| PIN9 – G2 | A       | G2 – Screen Grid     | CONNECTED |

SECTION RATINGS

| SECTION1 Pentode                            |                |
|---------------------------------------------|----------------|
| PLATE RESISTANCE                            | 23000 $\Omega$ |
| TRANSCONDUCTANCE                            | 0.009 S        |
| AMPLIFICATION FACTOR                        | 8              |
| MAXIMUM PLATE VOLTAGE                       | 220 V          |
| MAXIMUM SCREEN VOLTAGE                      | 220 V          |
| MAXIMUM PLATE DISSIPATION                   | 12 W           |
| MAXIMUM SCREEN DISSIPATION                  | 1.75 W         |
| MAXIMUM CATHODE CURRENT                     | 100 mA         |
| <i>Filename-matched Russian entry only.</i> |                |

Power pentode for television vertical-deflection and audio-frequency output amplification. The supplied French datasheet was translated to English for descriptive output.

## SOURCE OPERATING CONDITIONS

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# 195X Tesla

Published test conditions and operating points. Values on this page are preserved as reported by this source.

195X TESLA

## Section 1 · Pentode

| CHARACTERISTICS |                 |                                                        |
|-----------------|-----------------|--------------------------------------------------------|
| PARAMETER       | PUBLISHED VALUE | CONDITION / NOTE                                       |
| Heater voltage  | 15 V            | Published nominal value or midpoint of published range |
| Heater current  | 300 mA          | Published nominal value or midpoint of published range |

| CAPACITANCE        |                 |                            |
|--------------------|-----------------|----------------------------|
| PARAMETER          | PUBLISHED VALUE | CONDITION / NOTE           |
| Input capacitance  | 13 pF           | Published first-page value |
| Output capacitance | 7 pF            | Published first-page value |

## SOURCE OPERATING CONDITIONS

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# 1961 Ferranti Technical Handbook

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1961 FERRANTI TECHNICAL HANDBOOK

## Section 1 · Pentode

| APPLICATION |                                       |                  |
|-------------|---------------------------------------|------------------|
| PARAMETER   | PUBLISHED VALUE                       | CONDITION / NOTE |
| Application | Frame time-base output / audio output | —                |

| OTHER                       |                 |                  |
|-----------------------------|-----------------|------------------|
| PARAMETER                   | PUBLISHED VALUE | CONDITION / NOTE |
| Peak positive anode voltage | 2000 V          | Pulse            |

| PARAMETER                 | PUBLISHED VALUE | CONDITION / NOTE |
|---------------------------|-----------------|------------------|
| Audio operation           | Published       | ClassA           |
| Push-pull audio operation | Published       | ClassAB,PushPull |



## SOURCE OPERATING CONDITIONS

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# 1963 Philips Electron Tubes Handbook V1

Published test conditions and operating points. Values on this page are preserved as reported by this source.

## 1963 PHILIPS ELECTRON TUBES HANDBOOK V1

### Section 1 · Pentode

| OTHER                |                                    |                    |
|----------------------|------------------------------------|--------------------|
| PARAMETER            | PUBLISHED VALUE                    | CONDITION / NOTE   |
| Plate voltage        | 170 V                              | AudioOutput;ClassA |
| Screen voltage       | 170 V                              | AudioOutput;ClassA |
| Control-grid voltage | -12.5 V                            | AudioOutput;ClassA |
| Plate current        | 70 mA                              | AudioOutput;ClassA |
| Screen current       | 3.5 mA                             | AudioOutput;ClassA |
| Peak plate current   | 220 mA                             | FrameOutput        |
| Application          | AF output or vertical/frame output | Section1           |

| CHARACTERISTIC       |                 |                  |
|----------------------|-----------------|------------------|
| PARAMETER            | PUBLISHED VALUE | CONDITION / NOTE |
| Transconductance     | 11000 $\mu$ S   | Section1         |
| Plate resistance     | 26000 $\Omega$  | Section1         |
| Amplification factor | 8               | Section1         |



# 1967 Mullard Receiving and Amplifying Valves

Published test conditions and operating points. Values on this page are preserved as reported by this source.

## 1967 MULLARD RECEIVING AND AMPLIFYING VALVES

### Section 1 · Pentode

| OTHER                             |                 |                    |
|-----------------------------------|-----------------|--------------------|
| PARAMETER                         | PUBLISHED VALUE | CONDITION / NOTE   |
| Plate supply voltage              | 600 V           | ClassA;ClassAB     |
| Screen-grid supply voltage        | 600 V           | ClassA;ClassAB     |
| Peak positive-pulse plate voltage | 2200 V          | VerticalDeflection |
| Peak cathode current              | 240 mA          | VerticalDeflection |

| CHARACTERISTIC      |                 |                  |
|---------------------|-----------------|------------------|
| PARAMETER           | PUBLISHED VALUE | CONDITION / NOTE |
| Plate voltage       | 170 V           | ClassA           |
| Screen-grid voltage | 170 V           | ClassA           |
| Grid No.1 voltage   | -12.5 V         | ClassA           |
| Plate current       | 70 mA           | ClassA           |
| Screen-grid current | 3.5 mA          | ClassA           |

| CAPACITANCE                    |                 |                  |
|--------------------------------|-----------------|------------------|
| PARAMETER                      | PUBLISHED VALUE | CONDITION / NOTE |
| Grid No.1 to plate capacitance | 0.6 pF          | —                |
| Grid No.1 input capacitance    | 13 pF           | —                |
| Plate output capacitance       | 6.8 pF          | —                |



# 1968 Mazda Belvu

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1968 MAZDA BELVU

## Section 1 · Pentode

| CHARACTERISTIC                                        |                 |                  |
|-------------------------------------------------------|-----------------|------------------|
| PARAMETER                                             | PUBLISHED VALUE | CONDITION / NOTE |
| TENSION filament .....<br>ccsrersesernerecenmencaenea | 15 V            | —                |

  

| OTHER                          |                 |                  |
|--------------------------------|-----------------|------------------|
| PARAMETER                      | PUBLISHED VALUE | CONDITION / NOTE |
| Courant filament .....s ... If | 300 mA          | —                |



SOURCE DATA APPENDIX

# 1972 Philips Receiving Tubes

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1972 PHILIPS RECEIVING TUBES

## Section 1 · Pentode

| CHARACTERISTICS |                 |                         |
|-----------------|-----------------|-------------------------|
| PARAMETER       | PUBLISHED VALUE | CONDITION / NOTE        |
| Heater voltage  | 15 V            | Published nominal value |
| Heater current  | 300 mA          | Published nominal value |

  

| OTHER                      |                 |                                 |
|----------------------------|-----------------|---------------------------------|
| PARAMETER                  | PUBLISHED VALUE | CONDITION / NOTE                |
| Maximum plate dissipation  | 12 W            | Published maximum rating        |
| Maximum peak anode voltage | 2 kV            | Frame-output pulse service      |
| Audio output power         | 5.3 W           | Published quick-reference value |



## SOURCE OPERATING CONDITIONS

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# 1973 Mazda Valves Binder 2

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1973 MAZDA VALVES BINDER 2

## Section 1 · Pentode

| CHARACTERISTICS  |                 |                                    |
|------------------|-----------------|------------------------------------|
| PARAMETER        | PUBLISHED VALUE | CONDITION / NOTE                   |
| Heater voltage   | 15 V            | Published nominal value            |
| Heater current   | 300 mA          | Published nominal value            |
| Transconductance | 10000 $\mu$ S   | Published operating characteristic |

| OTHER                               |                    |                            |
|-------------------------------------|--------------------|----------------------------|
| PARAMETER                           | PUBLISHED VALUE    | CONDITION / NOTE           |
| Maximum plate dissipation           | 12 W               | Published maximum rating   |
| Maximum positive peak anode voltage | 2 kV               | Pulse operation            |
| Application                         | Frame output stage | Printed source application |



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# 1975 RCA RC30

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1975 RCA RC30

## Section 1 · Pentode

| OTHER                         |                 |                                                             |
|-------------------------------|-----------------|-------------------------------------------------------------|
| PARAMETER                     | PUBLISHED VALUE | CONDITION / NOTE                                            |
| Heater Voltage (ac/dc) 8 10.6 | 15 V            | Published in approved XL86 target datasheet entry; Section1 |
| Heater Current 0.76 0.6 0.45  | 300 mA          | Published in approved XL86 target datasheet entry; Section1 |

| PARAMETER                              | PUBLISHED VALUE | CONDITION / NOTE                                            |
|----------------------------------------|-----------------|-------------------------------------------------------------|
| Plate Supply Voltage                   | <b>600 V</b>    | Published in approved XL86 target datasheet entry; Section1 |
| Grid-No.2 Voltage                      | <b>220 V</b>    | Published in approved XL86 target datasheet entry; Section1 |
| Grid-No.2 (Screen-Grid) Supply Voltage | <b>600 V</b>    | Published in approved XL86 target datasheet entry; Section1 |
| Grid-No.2 Input                        | <b>2.1 W</b>    | Published in approved XL86 target datasheet entry; Section1 |
| Peak Grid-No.2 Input                   | <b>7 W</b>      | Published in approved XL86 target datasheet entry; Section1 |
| Plate Voltage                          | <b>170 V</b>    | Published in approved XL86 target datasheet entry; Section1 |
| Grid-No.1-Circuit Resistance           | <b>1 MΩ</b>     | Published in approved XL86 target datasheet entry; Section1 |
| Plate Voltage                          | <b>275 V</b>    | Published in approved XL86 target datasheet entry; Section1 |
| Peak Positive-Pulse Plate Voltage#     | <b>2200 V</b>   | Published in approved XL86 target datasheet entry; Section1 |
| Grid-No.2 Voltage                      | <b>275 V</b>    | Published in approved XL86 target datasheet entry; Section1 |
| Peak Negative-Pulse Grid-No.1 Voltage  | <b>250 V</b>    | Published in approved XL86 target datasheet entry; Section1 |
| Peak Cathode Current                   | <b>240 mA</b>   | Published in approved XL86 target datasheet entry; Section1 |
| Average Cathode Current                | <b>110 mA</b>   | Published in approved XL86 target datasheet entry; Section1 |
| Plate Dissipation                      | <b>12 W</b>     | Published in approved XL86 target datasheet entry; Section1 |

| CAPACITANCE                                            |                 |                                                             |
|--------------------------------------------------------|-----------------|-------------------------------------------------------------|
| PARAMETER                                              | PUBLISHED VALUE | CONDITION / NOTE                                            |
| Grid No.1 to Plate                                     | <b>0.6 pF</b>   | Published in approved XL86 target datasheet entry; Section1 |
| Grid No.1 to Cathode, Heater, Grid No.2, and Grid No.3 | <b>13 pF</b>    | Published in approved XL86 target datasheet entry; Section1 |
| Plate to Cathode, Heater, Grid No.2, and Grid No.3     | <b>6.8 pF</b>   | Published in approved XL86 target datasheet entry; Section1 |

| CHARACTERISTIC                   |                     |                                                             |
|----------------------------------|---------------------|-------------------------------------------------------------|
| PARAMETER                        | PUBLISHED VALUE     | CONDITION / NOTE                                            |
| Grid-No.2 Voltage                | 170 V               | Published in approved XL86 target datasheet entry; Section1 |
| Grid-No.1 (Control-Grid) Voltage | 12.5 V              | Published in approved XL86 target datasheet entry; Section1 |
| Plate Resistance                 | 26000 $\Omega$      | Published in approved XL86 target datasheet entry; Section1 |
| Transconductance                 | 11000 $\mu\text{S}$ | Published in approved XL86 target datasheet entry; Section1 |
| Plate Current                    | 70 mA               | Published in approved XL86 target datasheet entry; Section1 |
| Grid-No.2 Current                | 3.5 mA              | Published in approved XL86 target datasheet entry; Section1 |



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# 1981 Russian Tubes Katsnelson and Larionov

Published test conditions and operating points. Values on this page are preserved as reported by this source.

#### 1981 RUSSIAN TUBES KATSNELSON AND LARIONOV

### Section 1 · Pentode

| CHARACTERISTICS      |                 |                                                                                |
|----------------------|-----------------|--------------------------------------------------------------------------------|
| PARAMETER            | PUBLISHED VALUE | CONDITION / NOTE                                                               |
| Plate current        | 70 mA           | Translated from Russian source; Ток анода . . . . . 70 mA                      |
| Transconductance     | 10 mA/V         | Translated from Russian source; Крутизна характеристики . . . . . , 10 mA/V    |
| Amplification factor | 2               | Translated from Russian source; Коэффициент усиления по 2-й сетке относительно |
| Heater current       | -315 mA         | Translated from Russian source; Ток накала. . a, 285—315                       |

| OTHER              |                 |                                                                                   |
|--------------------|-----------------|-----------------------------------------------------------------------------------|
| PARAMETER          | PUBLISHED VALUE | CONDITION / NOTE                                                                  |
| Plate voltage      | <b>250 V</b>    | Translated from Russian source; Напряжение анода г , . Ква 250 В                  |
| Cathode current    | <b>100 mA</b>   | Translated from Russian source; Ток катода , . . , . . й ке 100 мА                |
| Screen dissipation | <b>1.75 W</b>   | Translated from Russian source; Мощность, рассеиваемая 2-й сеткой , , . й 1,75 Вт |



#### SOURCE OPERATING CONDITIONS

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# 1999 Philips E-Z

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1999 PHILIPS E-Z

## Section 1 · Pentode

| OTHER                                     |                 |                                                  |
|-------------------------------------------|-----------------|--------------------------------------------------|
| PARAMETER                                 | PUBLISHED VALUE | CONDITION / NOTE                                 |
| Anode peak voltage $V_{a,P \max}$         | <b>2 kv</b>     | Anode peak voltage $V_{a,P \max}$ . 2 kv         |
| Cathode current $I_k \max$                | <b>100 mA</b>   | Cathode current $I_k \max$ . 100 mA              |
| Output power $W$ ,                        | <b>5.3 W</b>    | Output power $W$ , 5.3 W                         |
| Heater current $I$                        | <b>300 mA</b>   | Heater current $I$ 300 mA                        |
| Anode to all except grid No.1 $C_{a(gl)}$ | <b>6.8 pF</b>   | Anode to all except grid No.1 $C_{a(gl)}$ 6.8 pF |
| Grid No.1 to all except anode $C_{gl(a)}$ | <b>13 pF</b>    | Grid No.1 to all except anode $C_{gl(a)}$ 13 pF  |
| Anode to grid No.1 $C_{agl \max}$         | <b>0.6 pF</b>   | Anode to grid No.1 $C_{agl \max}$ . 0.6 pF       |
| Grid No.1 to heater $C_{glf \max}$        | <b>0.25 pF</b>  | Grid No.1 to heater $C_{glf \max}$ . 0.25 pF     |
| Supply voltage $V_i$ 170                  | <b>200 v</b>    | Supply voltage $V_i$ 170 200 v                   |
| Load resistance $R_a$ 2                   | <b>2.5 kΩ</b>   | Load resistance $R_a$ 2 2.5 kΩ                   |
| Anode current $I_{75 - 76 \ 65}$          | <b>64 mA</b>    | Anode current $I_{75 - 76 \ 65}$ - 64 mA         |
| current $I_{g2 \ 4.0 - 16.5 \ 3.2}$       | <b>11.4 mA</b>  | 2 current $I_{g2 \ 4.0 - 16.5 \ 3.2}$ - 11.4 mA  |
| Output power $W$ , 0 0.05 5.1 0 0.05      | <b>5.3 W</b>    | Output power $W$ , 0 0.05 5.1 0 0.05 5.3 W       |

| PARAMETER                                      | PUBLISHED VALUE | CONDITION / NOTE                                  |
|------------------------------------------------|-----------------|---------------------------------------------------|
| Anode current $I_y$ 56                         | <b>54 mA</b>    | Anode current $I_y$ 56 - 54 mA                    |
| Grid No.2 current $I_{gz}$ 2.2                 | <b>9.7 mA</b>   | Grid No.2 current $I_{gz}$ 2.2 - 9.7 mA           |
| Output power W, 00.05                          | <b>5.4 W</b>    | Output power W, 00.05 5.4 W                       |
| Anode supply voltage $V_{ba}$ 200              | <b>230 v</b>    | Anode supply voltage $V_{ba}$ 200 230 v           |
| Grid No.2 voltage 200                          | <b>200 v</b>    | Grid No.2 voltage 200 200 v                       |
| Anode current 2x60 - 2x64.5<br>2x56 -- 2x6     | <b>1 mA</b>     | Anode current 2x60 - 2x64.5 2x56 -- 2x61 mA       |
| Grid No.2 current 2x3.0 ~<br>2x18.52x2.3 - 2x1 | <b>7.5 mA</b>   | Grid No.2 current 2x3.0 ~ 2x18.52x2.3 - 2x17.5 mA |
| Output power 00.05 14.3<br>00.05               | <b>17.5 W</b>   | Output power 00.05 14.3 00.05 17.5 W              |
| Anode voltage $V_{ao}$ max                     | <b>550 V</b>    | Anode voltage $V_{ao}$ max. 550 V                 |
| Grid No.2 voltage $V_{g20}$ max                | <b>330 V</b>    | Grid No.2 voltage $V_{g20}$ max. 330 V            |
| Cathode current $I_x$ max                      | <b>100 mA</b>   | Cathode current $I_x$ max. 100 mA                 |
| Cathode to heater voltage<br>$V_{kf}$ max      | <b>200 V</b>    | Cathode to heater voltage $V_{kf}$ max. 200 V     |

## TUBE TINKER

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