28 cm-Rectangular TV Picture Tube, 90° deflection angle, aluminized screen, with tension band for battery-operated television-sets

Electron gun
Bulb
Base
Focusing
Deflection
Angle of deflection
Neck diameter

Tetrode with Einzel-lens
All-glass
Special miniature
(7 pins)
Electrostatic
Magnetic
Diagonal 90°
Horizontal 80°
Vertical 63°
20 mm

Face
Shape
Material
Phosphor
Fluorescence colour
Colour temperature
Minimum useful dimensions
Overall length incl. base
Weight

Spherical
Filter-glass (Light-transmittance 62% appr.)
F 4-Aluminized
White
7500°K appr.
228 x 171 mm
Diagonal 262.5 mm
Max 245 ± 5 mm
2.0 kg appr.

1. Heater Characteristics for Parallel Connection
Heater voltage 11 volts
Heater current 68 appr. ma
Coxio cathode, indirectly heated

2. Typical Operating Conditions (Cathode drive service)²)
Anode voltage 11000 volts
Screen grid voltage 200 to 350 volts
Focus grid voltage 4) 0 to 350 volts
Cut-off voltage 45 appr. 3) 32 to 58 volts

The external conductive coating of the tube shall be grounded.
The tube can be used without safety glass.

1) At mains-connection ± 15%.
At stabilized operation or when heating from the scanning-line-transformer ± 10%.
At battery operation look at the diagram on page 6.

2) Unless otherwise specified, all voltages are positive with respect to grid No. 1.

3) The cut-off voltage is defined by tact voltage, below which disappears the raster adjusted to give a sharp image.

4) The voltage to be set depends on the deflection system utilized and the operating conditions.
3. Ratings

Anode voltage \((I_a = 0)\) 12 000 volts
Minimum anode voltage 7 5001) volts
Maximum grid No. 3 voltage 450 volts
Maximum negative grid No. 3 voltage -100 volts
Maximum screen grid voltage 450 volts
Minimum screen grid voltage 180 volts
Maximum cathode voltage 100 volts
Minimum cathode voltage 0 volt
Maximum cathode peak voltage 3502) volts
Minimum negative cathode peak voltage -2 volts
Specific screen dissipation per sq cm 10 mw/cm²
Grid leak resistance DC 1.5 megohms
Grid leak resistance AC (50 C/s) 0.5 megohm
External resistance between heater and cathode DC 1.03) megohms
External resistance between heater and cathode AC (50 C/s) 0.14 megohm
Maximum heater - cathode voltage 805) volts
Maximum heater - cathode peak voltage 130 volts

The power source generating the operating voltage shall be designed so that the permanent current resulting from a short-circuit is less than 5 ma.

4. Capacitances

Control grid - all other electrodes approx. 6 pF
Cathode - all other electrodes approx. 3 pF
Anode - external conductive coating 700 pF
Anode - tensionband 125 pF

5. Particular Indications

a) The maximum grid No. 3 current may be 24 µA.

b) The high field intensity present in the tube neck may lead to fluorescence on the glass; however, no conclusions can be drawn from this as to vacuum and life of tube.

c) Excluding extraneous fields, the center of the undeflected focused spot will fall within a circle having 9.0 mm radius concentric with the center of the tube face.

Notes for page 2

1) The anode voltage should not be below minimum rating. The picture sharpness decreases with decreasing anode voltage, and with an anode voltage below 7500 volts dark screen areas might appear due to the aluminization, as the velocity of the electrons will not be sufficiently high to penetrate the aluminium coating.

2) Line change impulse max 22 % of line sweep period.
Frame change impulse max 1.5 ms.

3) With separate transformer.

4) With series connection.
When fed by separate transformer, this external resistance may be 1 MΩ.

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5) To avoid picture distortions, the interference proceeding from the heater must be kept as low as possible. Therefore, the AC-voltage between heater and cathode shall by no means exceed the value $V_{hk rms} = 20$ volts.

Notes for page 4 and 7

1) The reference line is defined by the marked plane of the reference line gauge if the letter rests against the cone of the bulb. The gauge must not be supported on the front.

2) Angular deviations between the anode cavity cap and the base pins No. 1 and 5.

3) This area is to be cleaned only with soft dry lintless cloth.

4) The point "Z" is a reference point to the position of the points "X" and "Y".
   The dimensions for the points "X", "Y" and "Z" are identically to the minimum useful screen dimensions.

5) For the mounting bolts, a free passage of at least 5,7 mm diameter at nominal position is ensured.

6) The indicated dimensions rely on the bulb.

7) This stud is provided for putting-on a clip (e.g. type Faston).
All dimensions in millimeters!
Cathode drive service

Anode voltage = 7500 to 12000 Volts
Grid 1/2 Voltage = 250 Volts

Cathode voltage to Grid 1 voltage

- Preliminary -
At battery operation the heater voltage has to stay into the hatched area during the discharging period.
Reference line gauge
for Picture tubes with 90° deflection angle
and 20 mm neck diameter

1 Cut-out on the outline

*Radius 15 touches with the angles 6° and 45°

All dimensions in millimeters!