

ELECTRONIC TUBE REFERENCE

11LO2I

Specialized - Uncategorized electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION

CONSTRUCTION

OTHER

Specialized Soviet electron-beam tube documented in a bilingual technical source. Available material does not establish its intended application confidently enough for a narrower functional description.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	—
NOMINAL HEATER	— / —	PARALLEL HEATER	— / —
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION1	Other
AMPLIFICATION FACTOR	2
English-primary bilingual extraction; published electrical table values retained in parameters.	

11LO2I Cathode-Ray Tube

The **11LO2I** (11ЛО2И) is a Soviet-manufactured electrostatic cathode-ray tube (CRT) designed for displaying electrical waveforms. It features electrostatic focusing and deflection, utilizing separate signal (vertical) and time (horizontal) deflection plate systems. The tube is built with multiple anodes to facilitate beam acceleration, focusing, and astigmatism correction.

Technical Specifications and Operating Parameters

The electrical parameters of the 11LO2I are specified under nominal operating conditions, with strict limits defined for safe and reliable operation.

Heater and Cathode Characteristics

The tube utilizes an indirectly heated cathode. The heater and cathode parameters are as follows:

- **Nominal Heater Voltage (U_h):** 6.3 V (with an allowable operational range of 5.7 V to 6.9 V)
- **Heater Current (I_h):** 0.3 A nominal (minimum 0.27 A, maximum 0.33 A)
- **Nominal Cathode Voltage (U_k):** -2000 V (with an allowable operational range of -2200 V to -1800 V)

Electrode Potentials

The operating potentials of the various electrodes are critical for proper beam formation, focusing, and acceleration. The potentials are referenced as follows: the modulator and first anode voltages are specified relative to the cathode, while all other voltages are specified relative to the mean potential of the signal plates.

- **Modulator Cutoff Voltage ($U_{zap.}$):** -75 V to -30 V (relative to cathode)
- **Modulation Voltage (ΔU):** Maximum 25 V
- **First Anode (Focusing) Voltage (U_{a1}):** 250 V to 450 V (relative to cathode)
- **Second Anode Voltage (U_{a2}):** -50 V to 50 V
- **Third Anode (Astigmatism) Voltage (U_{a3}):** -50 V to 50 V
- **Fourth Anode Voltage (U_{a4}):** 8000 V nominal (allowable operational range of 5000 V to 9000 V)
- **Shielding Plates Voltage ($U_{\text{Э.П.}}$):** -50 V to 50 V
- **Grid Voltage (U_c):** -50 V nominal
- **Mean Potential of Deflecting Plates ($U_{cp.п.}$):** 0 V nominal
- **Mean Potential of Time Plates ($U_{cp.п.вп.}$):** 0 V to 20 V (limit value)
- **Modulator Voltage (U_{MOD}):** -160 V to -1 V (limit value)

Deflection and Screen Performance

The 11LO2I features asymmetrical deflection sensitivities for its two coordinate axes, optimized for oscilloscope applications where the signal axis requires higher sensitivity than the timebase axis.

- **Signal System Deflection Sensitivity (S_y):** Minimum 2.2 mm/V
- **Time System Deflection Sensitivity (S_x):** Minimum 0.7 mm/V
- **Initial Screen Brightness (L):** Minimum 70 cd/m²
- **Initial Line Width (B):** Maximum 0.5 mm

Pinout and Electrode Connections

The 11LO2I utilizes a multi-pin base with direct connections to the internal electrodes. The pin assignments are designated as follows:

Pin / Terminal	Electrode Connection
1, 14	Heater (Подогреватель)
2	Cathode (Катод)
3	Modulator (Модулятор)
4	First Anode / Focusing (U_{a1})
5	Third Anode (U_{a3})
7	Second Anode (U_{a2})
9	Shielding Plates (Пластины экранирующие)
10	Grid (Сетка)
6, 8, 11, 12, 13	Free / Unconnected Pins (Свободные)
D_1, D_2	Time Plates (Пластины временные)
D_3, D_4	Signal Plates (Пластины сигнальные)
A	Fourth Anode (U_{a4})

Operational Constraints and Service Life

To ensure the minimum specified operating life of **1000 hours**, several strict operational guidelines must be followed:

- Simultaneous Limits:** Operating the tube at two or more maximum allowable limit values of its electrical parameters simultaneously is strictly prohibited.
- Mounting Restrictions:** The free lugs of the tube socket and the free pins of the tube stem (pins 6, 8, 11, 12, and 13) must not be used as support or tie points for circuit wiring or mounting.
- Parameter Degradation Over Time:** During long-term operation, certain performance parameters are permitted to degrade within specified limits:
 - The line width may increase up to a maximum of 0.6 mm.
 - The required modulating voltage may increase up to 30 V.
 - The screen brightness may decrease to a minimum of 55 cd/m².

Technical Summary

The **11L02I** is a specialized Soviet electrostatic cathode-ray tube featuring a nominal 6.3 V heater, a high-voltage cathode operating near -2000 V, and a multi-anode structure including focusing and astigmatism controls. With a high-voltage post-deflection acceleration anode (fourth anode) rated up to 9000 V, it provides a sharp trace (0.5 mm initial line width) and a bright display (70 cd/m² initial brightness). Its deflection system is split into a highly sensitive signal system (minimum 2.2 mm/V) and a

time system (minimum 0.7 mm/V), making it highly suitable for precision display and measurement applications when operated within its strict electrical limits.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

195X Russian

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

195X RUSSIAN

Section 1 · Other

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Source symbol nnoayvesomy	11 A	x npubopy snextponnoayvesomy 11 AO2Z2U
Source symbol MOAyJNAT0pa	3 A	Hanpsxenne MOAyJNAT0pa 3anupaiolee) _
Source symbol CHCTEMDI,	7 mm	CHCTEMDI, 7MM/B Sy 2,2
Source symbol YKa	3 A	TanbHKe HANDAAKEHHA YKa3aHH OTHOCHTE/IbHO CPEHero NOTEHIHAJA2 CHIHAIJba
Source symbol PEREJbLHBIE	3 h	NPEREJbLHBIE 3HAYEHHUS JONYCTHMBIX 3JIEKTPHUYECKHX
Published electrical parameter	3-1 A	7 Py 9 5 3-1 aHop
Source symbol ONYCTHMBbIX	3 h	aBYX u GoJxee npeadbHO JONYCTHMBbIX 3HAYEHHAX Napamer-
Source symbol po	0.6 mm	anpuu po 0,6 MM, yBeJdHUEHHE MOJLYJIHPYIOUIEP0 HANPSIKEHHS NG
Source symbol JIHPYIOUIEP	0 h	anpuu po 0,6 MM, yBeJdHUEHHE MOJLYJIHPYIOUIEP0 HANPSIKEHHS NG
Published electrical parameter	3 A	3ak. 6886

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