

ELECTRONIC TUBE REFERENCE

16LO2I

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	60
English-primary bilingual extraction; published electrical table values retained in parameters.	

16LO2I — Dual-Gun Electrostatic Cathode-Ray Tube

The **16LO2I** (16ЛО2И) is a specialized, Soviet-manufactured cathode-ray tube (CRT) designed for the visual observation and registration of electrical processes in a wide range of radio-technical devices. It features electrostatic focusing and electrostatic deflection of the electron beams, producing a green screen display with a medium persistence of no more than 0.1 seconds.

Overview

The 16LO2I is distinguished by its dual-gun (dual-beam) internal construction, incorporating two independent electron-optical systems (designated as system "a" and system "b"). This configuration allows the simultaneous display and comparison of two separate electrical signals. The tube utilizes electrostatic

fields for both focusing and deflecting the electron beams, ensuring high-speed response suitable for oscillographic and signal-registration applications.

Electrode Configuration and Pin Connections

The 16LO2I features a multi-pin base layout to accommodate the independent electrodes of both electron gun assemblies, alongside dedicated deflection plates. The pinout configuration is defined as follows:

Pin	Connection
1	Heater, system a
2	Modulator, system a
3	Not connected
4	Second anode, system a
5	Time plate X1a
6	Second anode, common (ab)
7	Time plate X1b
8	First anode, system b
9	Cathode, system b
10	Heater, system b
11	Heater, system b
12	Modulator, system b
13	Not connected
14	Second anode, system b
15	Time plate X2b
16	Not connected
17	Time plate X2a
18	First anode, system a
19	Cathode, system a
20	Heater, system a

In addition to the base pins, the tube features several dedicated external connections:

- **A3:** Third anode lead

- **Y1a:** Signal plate, system a
- **Y1b:** Signal plate, system b
- **Y2a:** Signal plate, system a
- **Y2b:** Signal plate, system b

The physical dimensions and mass of the tube are:

- **Maximum overall length:** 450 mm
- **Maximum screen size:** 117 mm × 137 mm
- **Maximum mass:** 1900 g

Electrical and Optical Specifications

Under standard operating conditions, the 16LO2I exhibits the following electrical and optical parameters:

- **Heater voltage:** 6.3 V
- **Heater current:** 0.54 to 0.66 A
- **First anode voltage:** 350 to 650 V
- **Second anode voltage:** 2000 V
- **Third anode voltage:** 3500 V
- **Negative cutoff voltage:** 40 to 100 V
- **Focused line width (at screen center):** ≤ 0.8 mm
- **Modulation voltage:** ≤ 45 V

Absolute Maximum Ratings and Lifetime Performance

To ensure reliable operation and prevent premature failure, the operating parameters of the 16LO2I must be maintained within the following absolute limits:

Parameter	Minimum	Maximum
Heater voltage	5.7 V	6.9 V
First anode voltage	0 V	1200 V
Second anode voltage	2000 V	4000 V
Third anode voltage	3500 V	7000 V
Cathode-to-heater voltage	-125 V	0 V
Modulator voltage	-200 V	0 V
Voltage between any deflection plate and the second anode	-500 V	500 V
Modulator circuit resistance	—	1.5 MΩ

Lifetime Performance (1000 Hours of Operation)

After a standard operating period of 1000 hours, the tube's parameters are specified to remain within the following limits:

- **Focused line width (at screen center):** ≤ 1.2 mm
- **Parasitic emission brightness:** ≤ 0.2 cd/m²
- **Modulation voltage:** ≤ 50 V

Environmental and Mechanical Tolerances

The 16LO2I is designed to withstand rigorous mechanical and environmental conditions during operation and storage:

Mechanical Tolerances

- **Vibration loads:** Frequency range of 1 to 60 Hz with an acceleration limit of 24.55 m/s² (equivalent to 2.5 g).
- **Multiple shocks:** Acceleration up to 147 m/s² (15 g) with a shock duration of 2 to 15 ms.

Environmental Tolerances

- **Ambient temperature:** 213 K to 343 K (or 228 K to 343 K under specific operating conditions).
- **Relative humidity:** Up to 98% at an ambient temperature of 298 K.
- **Low atmospheric pressure:** Down to 70,000 Pa.
- **High atmospheric pressure:** Up to 297,198 Pa.

Storage Conditions

When stored in the manufacturer's original packaging or when integrated into equipment, the storage environment must be a heated warehouse maintained at a temperature between 274 K and 313 K, with a relative humidity not exceeding 80% at 298 K.

Application and Installation Guidelines

When integrating the 16LO2I into electronic systems, several critical design and handling rules must be observed:

1. **Simultaneous Limits:** Operation of the CRT at two or more absolute maximum limits simultaneously is strictly prohibited.
2. **Mechanical Mounting:** The tube must be secured within the equipment using shock-absorbing pads. Direct contact between the glass bulb of the CRT and any metallic structural parts of the equipment is not permitted.
3. **Automatic Beam Blanking:** Designers are strongly recommended to implement an automatic beam blanking (cutoff) circuit. This circuit must automatically cut off the electron beams if the sweep

generator fails, preventing screen burn-in and tube failure during power-on, power-off, or sweep circuit malfunctions.

4. **Breakdown Protection:** The associated circuitry should include protective measures against short-term electrical breakdowns within the CRT that do not otherwise cause permanent device failure.
5. **Tropical Climate Preparation:** For units intended for use in tropical climates, the external metallic components are coated with a protective layer of vaseline to prevent corrosion. This protective layer must be thoroughly removed before placing the device into active service.

Technical Summary

The **16LO2I** is a dual-gun, electrostatically focused and deflected cathode-ray tube featuring a green-emitting screen with a medium persistence of ≤ 0.1 s. Operating with a nominal 6.3 V heater, it requires a multi-anode supply configuration (typically 350–650 V on the first anode, 2000 V on the second, and 3500 V on the third) to achieve a sharp, focused line width of ≤ 0.8 mm. Its independent dual-beam architecture, robust mechanical and environmental tolerances, and specific installation requirements make it a highly capable display component for demanding visual registration and oscillographic applications.

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 I	2 h	AnekrponHoayuesasl Tpy6ka 16J/I02H ¢ s1ekTpOCTATHECKMH thokycHpoBKO#H
Published electrical parameter	-35 A	‘-35 achy (g & B @ cln jme
Source symbol a	16 h	2 Moayaartop a 16 He moakiouen
Published electrical parameter	3 h	3 He nmopxmouen 17 Inactuna BpeMeHuas Xpa
Published electrical parameter	4 A	4 Ason BTOpOH 2 18 AHoj mepBbli a
Published electrical parameter	18 A	4 Ason BTOpOH 2 18 AHoj mepBbli a
Published electrical parameter	6 A	6 Awuox Bropoit aB 20 Tloporpenarens a
Published electrical parameter	8 A	8 Auon nepswil B
Published electrical parameter	13 h	13 He moaxmouer ¥y [lnactHHa eHrHanbHas
Published electrical parameter	14 A	14 Ason Bropoii B 2
Source symbol B0	3 A	2.1, BJIT nomyckaioT SKCIJAyaTal{io Toc/de BO3ACHCTBHE Ha HHX CJeAYIONIHX
Source symbol go	60 Hz	— BHOpaUHOHHBIX HArpy3oK B jAdanaszoHe uactoT ot go 60 Hz c yckopenuenm
Source symbol ra	3 A	— TEeMOEepaTyphl BO3ZyXa MJAH JApypora ra3a (Kpome arpeccusmoro) or 213
Source symbol pabjenust	70000 pA	— MOOHHXeHHOro aTMoctepnoro pabjenust 70000 Pa;

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Published electrical parameter	198 pA	— NOBBllEHhOTO faBJjeHHd Bosayxa 297 198 Pa,
Source symbol anpsizkenne	3 A	Hanpsizkenne 3ammpawlgee, oTpHuareasioe, V. . . . 100—40
Source symbol TeuewHe	1000 h	3.2. DnekTpHueckie nmapamerpul B TeuewHe 1000 h skcnayaTauuu
Source symbol lpegenbHbie	3 h	3.3. IlpegenbHbie 3HaYEHHs nonycmmmx pemmos 9xcnnya1'aufln
Source symbol mutyc	500 A	anogoM, V . . . ot mutyc 500 a0 500
Source symbol YKa	3 A	4. YKa3aHHs 10 [IPHMEHEHHIO W SKCMAYATAULHH
Source symbol IPHMEHEHHI	0 W	4. YKa3aHHs 10 [IPHMEHEHHIO W SKCMAYATAULHH
Source symbol NOMYCTHMBIX	3 h	npenesbHG NOMYCTHMBIX 3HAUEHHSIX INapaMeTPOB 3JICKTDHUECKHX PeXHMOB,
Source symbol nonxHbL	3 A	4.2. DJIT nonxHbL 3aKpeiATbCA B anmapatype IMPH IOMOUIH aMOPTHPbHO-
Source symbol OMATHUECKOE	3 A	CMOTPCTh aBTOMATHUECKOE 3aMHpaHHe 3JleKTPOHHOTO Jy4a RJAs Mperynpexaens
Source symbol Jy	4 A	CMOTPCTh aBTOMATHUECKOE 3aMHpaHHe 3JleKTPOHHOTO Jy4a RJAs Mperynpexaens
Source symbol ycMaTpHBATH	3 A	4.4. PexoMmengyercd TpeaycMaTpHBATH 3aUIMTy palHO3NEKTPOHHON anmapaTypul
Source symbol mpeAHA	3 h	Y npyGopos, mpeAHA3HAYEHHBIX A PaGOTH B CTpaHaX q TPOMHUECKHM K/HMAa-
Source symbol KOPPO	3 h	HeHHI HX OT KOPPO3HH, a MOTOMY, MpH BBOAe TpHOOP B IKCHAYATALHIO, caelyeT
Published electrical parameter	3 A	3ak. 2830—80

TUBE TINKER

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