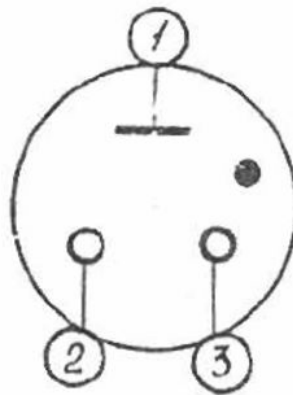
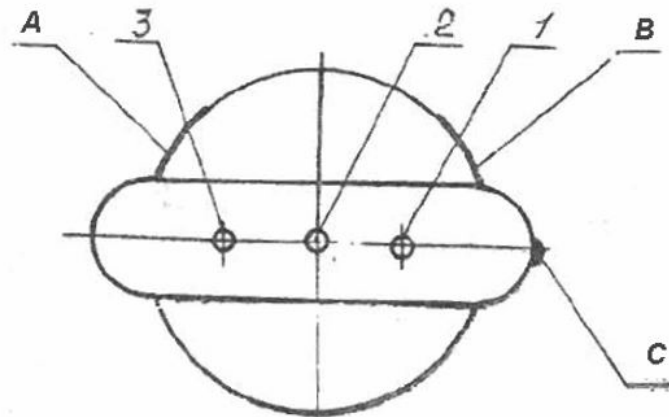


IN-13

Linear analog, continuous use gas discharge indicator IN-13, is intended to display electrical values transforming them into glowing bar, length of which is proportional to current flowing through device.



1. Anode
2. Indicating cathode
3. Auxiliary cathode



- A. Two strokes $90^\circ \pm 10^\circ$ on edge
- B. Stroke $90^\circ \pm 10^\circ$ on edge of working segment begin.
- C. Indicator label

* Indicator glass curvature for up to 1 mm is allowed.

1. Basic electrical characteristics:

Auxiliary cathode firing voltage (no more than)	140 V
Indicating cathode keep-up voltage	94-99 V
Max working current	3.5-4.6 mA
Min working current	0.2-0.6 mA
Absolute linearity	+/- 4 mm
Min brightness (no less than)	50 cd/m ²
Response time (no more than)	1 Second
Allowed length increase, when temperature fall from 20°C to -60°C (no more than)	9mm
Allowed length decrease, when temperature rise from 20°C to 70°C (no more than)	9mm
Maximal deviation from primary current, due wearing (no more than)	0.4mA

2. Maximal allowed characteristics:

Parameter	Norm	Notes
Power supply voltage	140V	
Indicating cathode current	4.6mA	1,2
Overload current	5.5mA	
Overload time	10 hours	
Auxiliary cathode current	0.11-0.15mA	

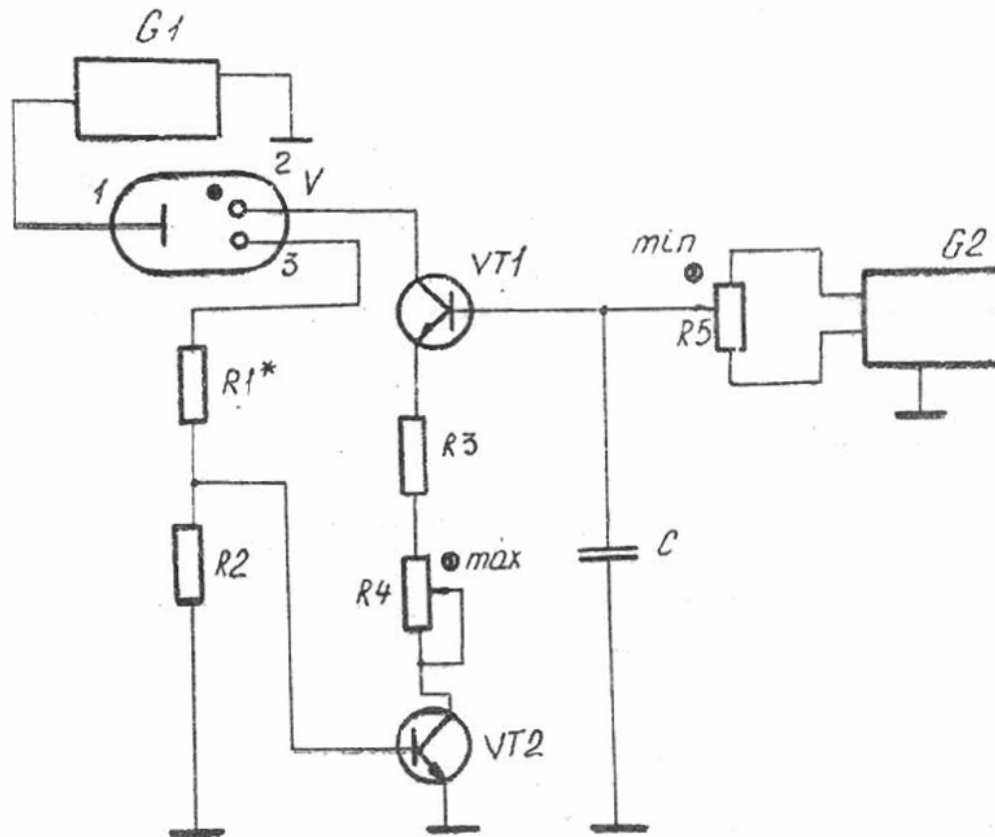
Notes:

1. On linear segment
2. Maximum time at a single column length is 10 hours without switching off. Maximum time in total for a single column length is 50 hours. Single column length is assumed when current change is no more than + - 0.04mA.

3. Usage notes

1. Recommended usage modes.
 - 1.1. Maximal values do should not exceed values mentioned in chapter 2.
 - 1.2. No reverse polarity.
 - 1.3. To avoid braking the light column when switching abruptly, we recommend:
 - When switching on, the main cathode should not be on, and there should only be current on the auxiliary cathode.
 - When you have 0,13mA +/- 0,02mA on the auxiliary cathode, apply the main current, but allow 100mS to increase to maximum – the minimum rate of change should be 50uA/second.
 - 1.4. Reference the example.
 - 1.5. Ensure, that anode is connected to positive and the auxiliary cathode to negative via resistor carrying a maximum current on auxiliary cathode 0,13mA +/- 0,02mA.
2. Indicator calibrating
 - 2.1. At mounting into device, begin of the measuring scale equalize with an upper edge of light-color line.
 - 2.2. Working position – any.

Connection diagram



C	Capacitor 50-110 uF, 50V
G1	Stabilized power supply 0-150V
G2	Control unit
R1*	Resistor 0.25W, 330Kohm, +/- 10%
R2	Resistor 0.25W, 30Kohm, +/- 10%
R3	Resistor 2W, 1Kohm, +/- 10%
R4	Variable resistor 1W, 1.5Kohm, +/- 20%
R5	Resistor 1W, 4.7Kohm, +/- 10%
V	IN-13 (this tube)
VT1	Transistor npn, $U_{CE} \geq 50V$
VT2	Transistor npn $U_{CE} \geq 50V$, $\beta \geq 50$

* Adjusted by experiment.