

INDICATOR TUBE

Long-life cold-cathode ten-digit indicator tube for side viewing.
The tube is designed for time-sharing (pulse) applications.

QUICK REFERENCE DATA

Numeral height		approx.	14	mm
Numerals			0 1 2 3 4 5 6 7 8 9	
Decimal point			to the left of the numerals	
Supply voltage	$V_{ba}(\text{pulse})$	min.	170	V
Anode current, peak	I_{ap}	min.	6	mA
		max.	20	mA
		average	I_a	max.

GENERAL

The numerals are 14 mm high and appear on the same base line allowing in-line read-out.

PRINCIPLE OF OPERATION

The tube contains ten cathodes in the form of ten numerals and one in the form of a decimal point; a primer, and one common anode. By applying a suitable voltage between the anode and one of the cathodes the corresponding numeral or the decimal point will be covered by a red neon glow.

The primer allows ionization without delay in strobe type or blanking applications.

SHOCK AND VIBRATION

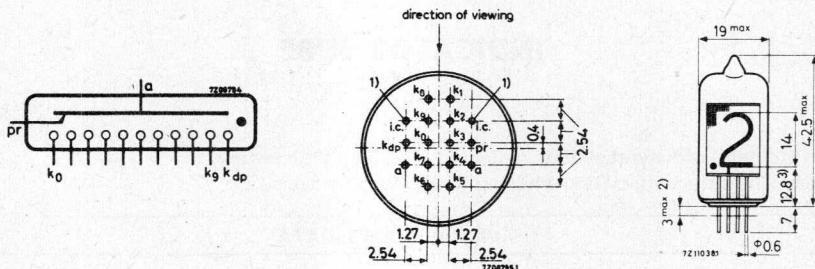
An indication for the ruggedness of the tube is the fact that 95% of the items sampled from the normal production line pass the shock and vibration tests specified below without perceptible damage.

Shock: 25 g_{peak} , 1000 shocks on one of the three positions of the tube.

Vibration: 2,5 g_{peak} , 50 Hz, during 32 hours in each of the three positions of the tube.

DIMENSIONS AND CONNECTIONS

Dimensions in mm



The deviation of the axes of the pins with respect to the true geometrical position cover an area of 0.3 mm diameter. The pin configuration is compatible with the reference grid for printed wiring according to IEC Publication 97 (0.1 in).

Mounting position: any

Soldering

The pins may be dip-soldered at a solder temperature of max. 240 °C for maximum 10 seconds up to a point 3 mm from the seals.

Natural frequency

The natural frequencies of the numeral cathodes lie within the range from 300 Hz to 800 Hz.

ACCESSORIES

55702 Tube socket (for 0.1 in grid). Phenolic. Tinned contacts.

55703 Snap-fit tube holder.

55704 Set of one left-hand and one right-hand end piece to complete the snap-fit indicator tube assembly.

1) i. c. pins max. length 2.8 mm

2) Not tinned

3) Standard deviation 0.13 mm

CHARACTERISTICS AND OPERATING CONDITIONS

Ignition voltage	V_{ign}	max. 170 V
Maintaining voltage	V_m	see page 4
Anode current, average ($T_{av} = \text{max. } 20 \text{ ms}$)	I_a	max. 2.5 mA
peak	I_{ap}	min. 6 mA
(with or without decimal point)	I_{ap}	max. 20 mA
Pulse duration	T_{imp}	min. 50 μs ¹⁾
Cathode selecting voltage	V_{kk}	min. 70 V ²⁾
	V_{kk}	max. 115 V
Cathode resistor, decimal point	R_{dp}	10 $k\Omega \pm 10\%$ ³⁾
Primer resistor (anode to primer supply voltage min. 170 V)	R_{pr}	10 $M\Omega \pm 10\%$
Extinguishing voltage	V_{ext}	min. 118 V

LIFE EXPECTANCY at $I_a = 2 \text{ mA}$

The life expectancy is dependent on the instantaneous and average values of anode current:

sequentially changing the display from one digit to the others every 100 h or less, $I_{ap} = 10 \text{ mA}$
 $I_{ap} = 20 \text{ mA}$

100 000 h
 20 000 h

Mean time between failures

min. 200 000 h

LIMITING VALUES (Absolute max. rating system)

Anode voltage necessary for ignition, pulse	V_{ap}	min. 170 V
Anode current, average ($T_{av} = 20 \text{ ms}$)	I_a	max. 2.5 mA
peak	I_{ap}	min. 6 mA
	I_{ap}	max. 20 mA
Pulse duration	T_{imp}	min. 10 μs
Cathode selecting voltage	V_{kk}	min. 70 V
	V_{kk}	max. 115 V
"Off" anode voltage	$V_{a''off''}$	max. 115 V
Ambient temperature	t_{amb}	min. -50 $^{\circ}\text{C}$ ⁴⁾
	t_{amb}	max. +70 $^{\circ}\text{C}$

1) Pulse durations down to 10 μs are allowed provided the minimum peak anode current is not less than 10 mA.

2) Lower values of V_{kk} result in increasing background glow impairing readability.

3) The decimal point cathode may not be operated without extra current limiting resistor unless a numeral cathode is operated simultaneously.

4) Bulb temperatures below 10 $^{\circ}\text{C}$ result in a reduced life expectancy and changes in characteristics.

For equipment to be used over a wide temperature range, "constant current operation" is recommended.

