

NUMERICAL INDICATOR TUBES

ZM1040
ZM1042

QUICK REFERENCE DATA

Cold cathode, neon-filled, side viewing indicator tubes with long life expectancy. The ZM1040 incorporates a red filter to improve the contrast of display. The ZM1042 is electrically identical to the ZM1040, but has no filter coating.

Numeral height	31	mm
	1.2	in
Numerals	0 1 2 3 4 5 6 7 8 9	
Cathode current	4.5	mA
Minimum supply voltage	170	V

CHARACTERISTICS AND RANGE VALUES FOR EQUIPMENT DESIGN measured at room temperature.

Minimum anode-to-cathode voltage necessary for ignition (see note 1)	170	V
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Anode-to-cathode maintaining voltage at 4.5mA (see page C1)	140 ± 10	V
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Anode-to-cathode voltage below which all tubes will extinguish	120	V
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D.C. operation		
Recommended cathode current	4.5	mA

Minimum positive bias on non-conducting cathodes (see note 2 and page C2)	60	V
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Half-wave a.c. supply

Recommended cathode current		
Average	2.5	mA
Peak	11	mA

Minimum positive bias on non-conducting cathodes (see note 2)	40	V
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LIFE EXPECTANCY at recommended operating conditions and room temperature (see note 2)

Continuous display of one digit	> 3000	h
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Sequentially changing the display from one digit to the others, every 100 hours or less	> 20 000	h
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RATINGS (ABSOLUTE MAXIMUM SYSTEM)

Cathode current (each digit)

Maximum average (averaging time=20ms)	6.0	mA
Maximum peak	20	mA
Minimum for d.c. operation	3.0	mA
Maximum negative current	0	mA

Bulb temperature

Maximum	+70	°C
Minimum (see note 1)	0	°C

MOUNTING POSITION

Any

The numbers are viewed through the side of the envelope and will appear upright (within $\pm 1.5^\circ$) when the tube is mounted vertically.

OPERATING NOTES

1. Bulb temperatures below 10°C result in a reduced life expectancy and changes in characteristics.

For operation in equipment to be used within a wide temperature range, the use of constant current operation (high supply voltage and high anode resistor) is recommended.

2. To obtain a good indication over life, the voltage between the conducting and remaining cathodes should be greater than the value specified. These conditions are automatically satisfied when the non-conducting cathodes are isolated by, for example, mechanical contacts. It should be noted that when using the curve on page C2, the probe current is not shared equally between the non-illuminated cathodes.

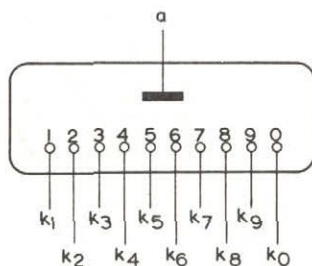
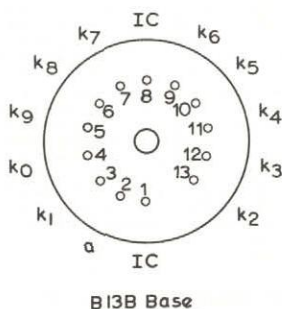
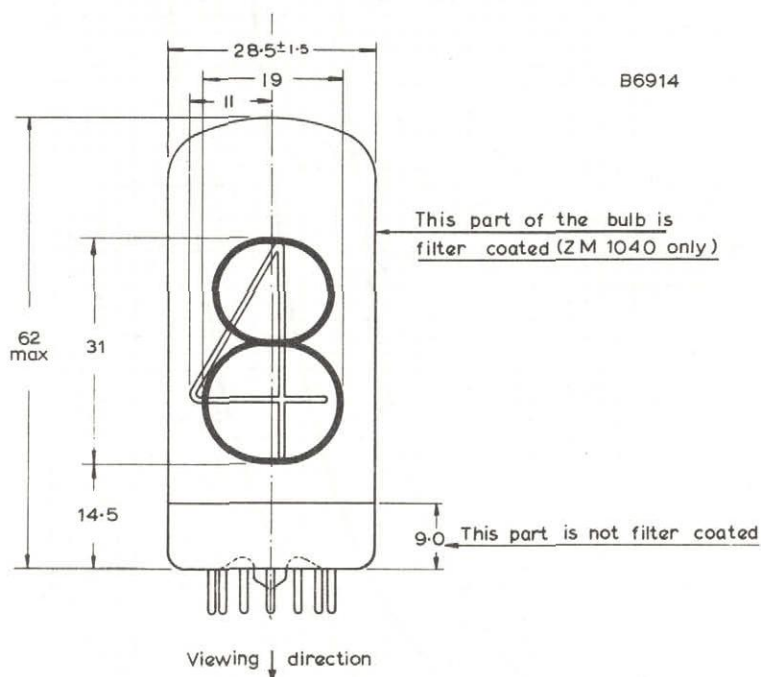
ACCESSORY

Valve holder

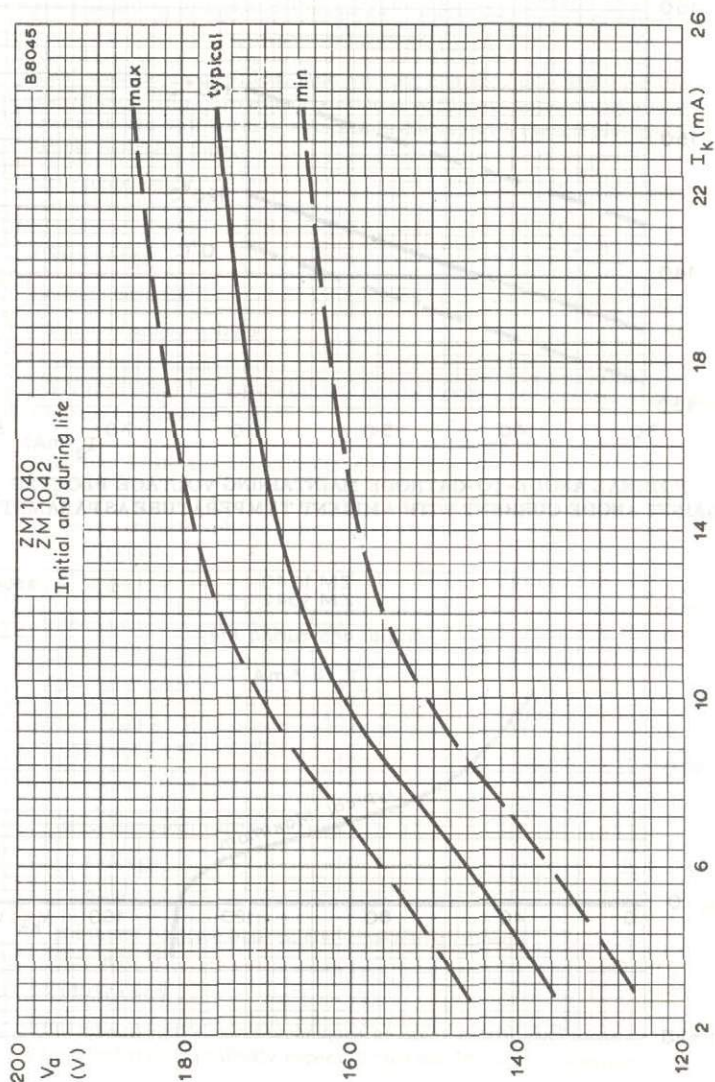
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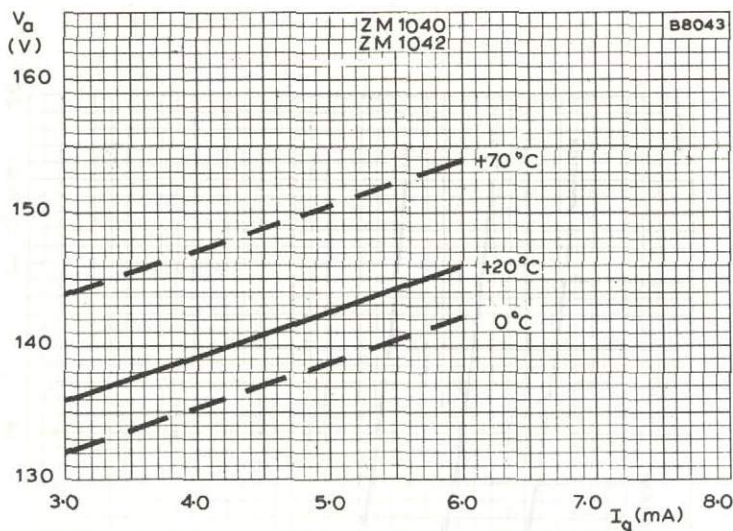
OUTLINE DRAWING



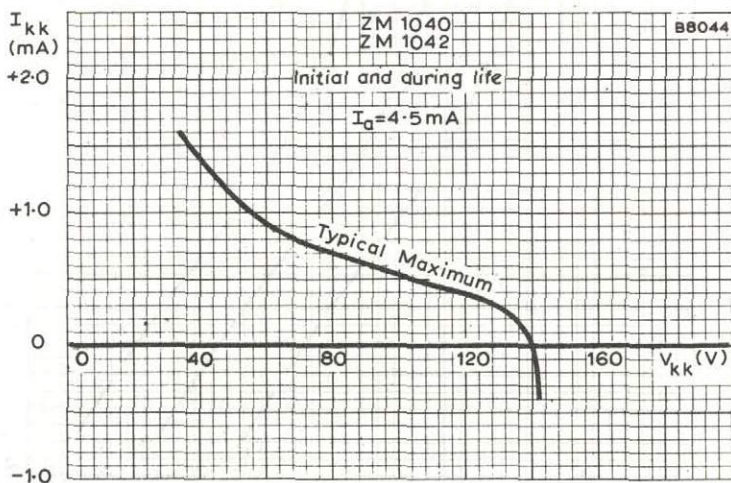
All dimensions in mm



NOMINAL ANODE-TO-CATHODE MAINTAINING VOLTAGE PLOTTED
AGAINST CATHODE CURRENT, WITH TYPICAL LIMITS



NOMINAL ANODE-TO-CATHODE MAINTAINING VOLTAGE PLOTTED AGAINST ANODE CURRENT WITH AMBIENT TEMPERATURE AS PARAMETER



SUM OF THE TOTAL PROBE CURRENT TO ALL NON-ILLUMINATED CATHODES PLOTTED AGAINST CATHODE BIAS VOLTAGE (D.C. OPERATION)